

**West Pasco County Landfill Expansion  
Cells A-3 and SW-2  
Certification of Construction Completion**

**GEOSYNTHETIC MANUFACTURERES  
CERTIFICATION DOCUMENTATION  
VOLUME 3 OF 4**

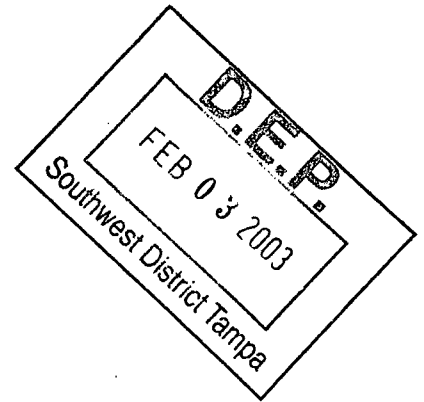
SECTION 1      GEOTEXTILE

SECTION 2      BENTOMAT

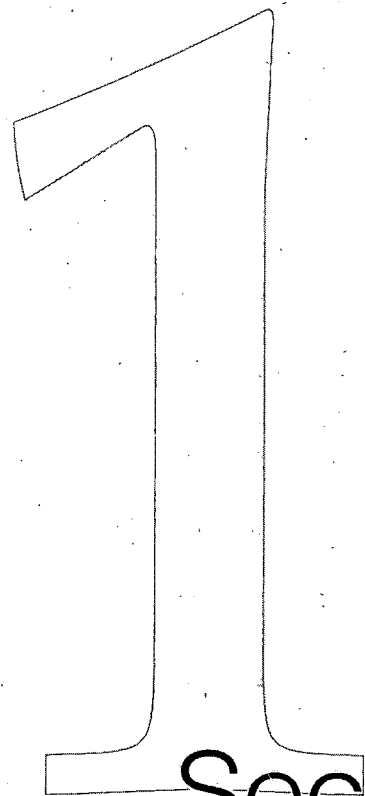
SECTION 3      CLAYMAX

SECTION 4      GEOMEMBRANE

SECTION 5      GEOCOMPOSITE NET LOTS 1-8



**VOLUME 3**



# Section One

# TRANSMITTAL SHEET

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

consulting, engineering,  
construction, operations

# CDM

Date: 2/27/02

To: Handex of Florida, Inc.  
2306 Gravel Drive

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V.P.

4 print(s) each of the following Submittal: D-02272-008-A (GEOTEX 861 Rolls Quality Assurance  
Testing Results)

which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments: \_\_\_\_\_

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\_\_\_\_\_  
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\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

Roll#	Style	Batch	Thick	Weight	MD Tensile XMD		MD Elongation XMD		MD Trap Tear XMD		Punct	Burst
BOL# 'S			D5199	D5261	D4632	D4632	D4632	D4632	D4533	D4533	D4833	D3786
	80153384		mils	oz/yd2	lbs	lbs	%	%	lbs	lbs	lbs	psi
A641540A	861	60940	100	8.0	240	236	58	65	100	101	141	420
A641560A	861	60940	102	8.2	255	252	59	65	95	120	153	451
A641680A	861	60940	109	8.6	289	262	63	68	135	140	149	494
A641785A	861	60940	116	8.7	268	272	58	76	179	186	159	453
A641800A	861	60940	113	8.6	263	260	58	72	180	129	163	487
A649230A	861	60976	99	8.3	225	246	56	63	133	138	141	487
A649234A	861	60976	110	9.1	265	249	62	66	134	182	157	526
A649250A	861	60976	104	8.5	275	271	61	64	125	193	136	513

Once rolls of nonwoven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence, test results listed above may include data from rolls which were not shipped and rolls listed may or may not be the actual rolls tested. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b> Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	<b>RESPONSE REQUIRED OF CONTRACTOR</b> Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequence or procedures of construction and performing his work in a safe manner.</p> <p>CAMP DRESSER &amp; MCKEE INC.</p>	
By <u>AMS</u>	Date <u>2/25/02</u>



02/26/02 12:53 FAX 18136264503  
FEB-25-2002 11:25HUGHES SUPPLY a  
SI CUSTOMER SERVICE

1 423 899 5005

002/004  
P.01

2/25/2002

Hughes Supply FL  
Mike3319 US Highway 301 N  
Tampa FL 33619  
BOL 80153384 PO 46822063

Ref: Contractor: Handex Construction Service Job: West Pasco County Landfill

This is to certify that Product GEOTEX 861, a nonwoven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level. This geotextile has been continuously inspected for the presence of needles and none were detected.

Physical Property	Test Method	US Units		SI Unit	
Mass Per Unit Area	ASTM D-5261	8.0	oz/yd <sup>2</sup>	(271.2)	g/m <sup>2</sup>
Thickness	ASTM D-5199	90	mils	(2.286)	mm
Tensile Strength	ASTM D-4632	220	lbs	(979)	N
Elongation	ASTM D-4632	50	%	50	%
Trapezoidal Tear	ASTM D-4533	95	lbs	(422.75)	N
Mullen Burst	ASTM D-3786	420	psi	(2895.4)	kPa
Puncture Strength	ASTM D-4833	135	lbs	(600.75)	N
A.O.S.	ASTM D-4761	80	Sieve	0.18	mm
Permittivity	ASTM D-4491	1.5	sec-1	1.5	sec-1
Permeability	ASTM D-4491	0.38	cm/sec	0.38	cm/sec
Water Flow Rate	ASTM D-4491	130	gpm/ft <sup>2</sup>	(5296.811)	lpm/m <sup>2</sup>
JV Resistance	ASTM D-4355	70	%	70	%

Strength Retained after 500 hours exposure in Xenon Arc Weatherometer

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

1/23/2001

## SHOP DRAWING REVIEW

ENGINEER'S REVIEW		RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/>	Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>
Approved as Noted <input type="checkbox"/>	Comments <input type="checkbox"/>	Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequence or procedures of construction and performing his work in a safe manner.</p> <p>CAMP DRESSER &amp; McKEE INC.</p>		
By <u>JMS</u>		Date <u>2/27/02</u>

## Synthetic Industries - Bill of Lading Roll List

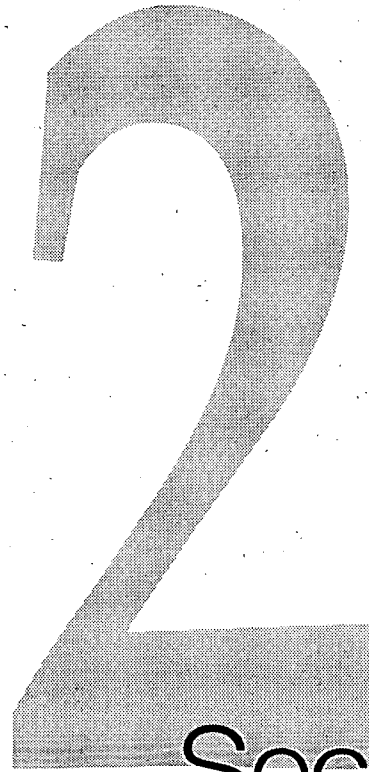
Bill of Lading # 80153384		Date Shipped: 2/22/2002	
Items on this Shipment:			
Roll #	Style	User Field 1	User Field 2
A641544A	861	60940	A641544
A641549A	861	60940	A641549
A641557A	861	60940	A641557
A641565A	861	60940	A641565
A641681A	861	60940	A641681
A641797A	861	60940	A641797
A641798A	861	60940	A641798
A641802A	861	60940	A641802
A649242A	861	60976	A649242
A649243A	861	60976	A649243
A649244A	861	60976	A649244
A649248A	861	60976	A649248
A649256A	861	60976	A649256

### SHOP DRAWING REVIEW

ENGINEER'S REVIEW		RESPONSE REQUIRED OF CONTRACTOR	
Approved <input checked="" type="checkbox"/>	Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>	
Approved as Noted <input type="checkbox"/>	Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>	

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CAMP DRESSER & MOORE INC.  
By AMS Date 2/27/02



# Section Two

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.

2306 Gravel Drive

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

6 print(s) each of the following Submittal: D-02275-014-A (QA/QC Roll Certificates: Bentomat ST  
(60 rolls) (Set 1 of 1))


which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments: \_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-19-01Submittal Identifier: D-02275-014-A☒ Original Submittal☐ SupplementSubmitted: November 19, 2001No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: QA/QC Roll Certificates: Bentomat ST (60 rolls) (Set 1 of 1)Specification Identifier: 01300, 02275 Section 1.03A.1 (c)Manufacturer: CETCO Lining Technologies, Inc.Installer: COMANCO Environmental Corporation**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

**SHOP DRAWING REVIEW****ENGINEER'S REVIEW**

Approved ☒ Not Approved ☐  
Approved as Noted ☐ Comments Attached ☐

**RESPONSE REQUIRED OF CONTRACTOR**

Confirm ☐  
Resubmit ☐

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

By AMSDate 12/3/01



# GEOSYNTHETIC CLAY LINER

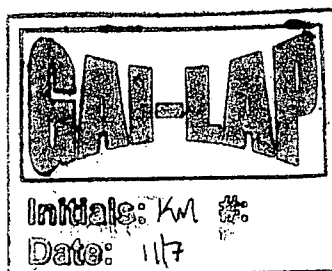
## MANUFACTURING

## QA/QC DATA PACKAGE

PROJECT NAME: GSE/Pasco County LF.

PREPARED FOR: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

PREPARED BY: Kelly Miller  
CETCO  
234 Gordon St. S.E.  
Fairmount, GA 30139  
TELEPHONE: (706) 337-5316  
FAX: (706) 337-2215





# GEOSYNTHETIC CLAY LINER

## DAILY MANUFACTURING QA/QC DATA

FOR ALL GCL MANUFACTURED ON:

GSE/PASCO COUNTY LF.  
SPRING HILL, FL  
PURCHASE ORDER # 3256-000-OD  
CETCO ORDER(S) #148665, 148668-148670

### CONTENTS:

1. DAILY GCL PRODUCTION CERTIFICATION
2. GCL MANUFACTURING CERTIFICATON AND TEST RESULTS
3. GCL MQA TRACKING FORM





# **DAILY GEOSYNTHETIC CLAY LINER PRODUCTION CERTIFICATION**







## GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

CETCO JOB:	GSE/PASCO COUNTY LF.
DATE:	NOVEMBER 7, 2001
ORDER#(S):	148665, 148668-148670
PRODUCT:	BENTOMAT ST

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the Geosynthetic Clay Liner (GCL) manufactured in this lot achieves the physical and chemical criteria listed on the attached sheets.

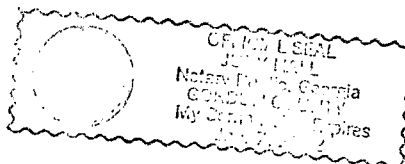
Kelly Miller

Kelly Miller  
Quality Analysis Coordinator  
CETCO-Colloid Environmental Technologies CO

Subscribed and sworn to before me this 7<sup>th</sup> day of Nov., 2001.

Judy Hlee

Notary Public





## BENTOMAT ST MANUFACTURING CERTIFICATION

TO: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

PROJECT: GSE/Pasco County LF.

ORDER #: 148665, 148668-148670

CETCO hereby affirms and certifies that Bentomat ST material supplied to this project will meet the physical criteria listed below:

PROPERTY	TEST METHOD	REQUIRED VALUE
<i>Bentonite</i>		
Free Swell	ASTM D 5890	24 min.
Fluid Loss	ASTM D 5891	18 max.
<i>Finished Product</i>		
Bentonite Mass/Area	ASTM D 5993*	0.75 lb/sq. ft. min.
Grab Strength	ASTM D 4632	90 lbs. MARV
Index Flux	ASTM D 5887	1 x 10 <sup>(-8)</sup> m3/m2/sec (max.)
Peel Strength	ASTM D 4632(modified)	15 lbs. min.
Permeability	ASTM D 5084	max. 5 x 10 <sup>(-9)</sup> cm/sec

\* Reported at 0% moisture content.

\*GCL has been continuously inspected for broken needles.

GAI Lab Accredited Test Methods were followed during conformance testing for :

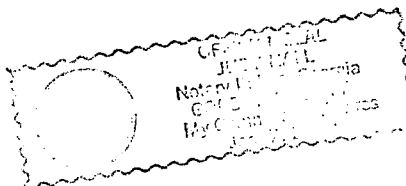
ASTM D 5993 - Bentonite Mass/Area

ASTM D 4632 - Grab Strength and Grab Elongation

Kelly Miller  
CETCO-Colloid Environmental Tech. CO

Subscribed and sworn to before me this 2<sup>nd</sup> day of Nov., 2001.

Judy Hall  
Notary Public



A Wholly Owned Subsidiary of AMCOL International



Printed on recycled paper.



# **GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS**



QCG#TFL QCT#TFL  
11/06/01 15:57:03

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148665  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200113FA 00000566	FA-BENTOMAT ST	150	2250	3500	18337251		200104VR	00000231	423520
LOT# 200127FA 00002577	FA-BENTOMAT ST	150	2250	2835	18583971		200126VR	00001674	455842
LOT# 200134FA 00004467	FA-BENTOMAT ST	150	2250	3087	80007365		200133VR	00002278	454641
00004468	FA-BENTOMAT ST	150	2250	3073	80007365		200133VR	00002278	454641
00004478	FA-BENTOMAT ST	150	2250	2928	80007362		200133VR	00002253	454641
00004494	FA-BENTOMAT ST	150	2250	3014	80007362		A529756A		454641
LOT# 200136FA3 00004560	FA-BENTOMAT ST	150	2250	2755	18982641		300075640		454730
00004561	FA-BENTOMAT ST	150	2250	2760	18982641		300075640		454730
00004562	FA-BENTOMAT ST	150	2250	2751	18982641		300075640		454730
00004568	FA-BENTOMAT ST	150	2250	2770	18996981		300075627		454730
00004571	FA-BENTOMAT ST	150	2250	2755	18996981		300075627		454730
00004598	FA-BENTOMAT ST	150	2250	2755	18996981		300075630		454730
LOT# 200138FA3 00005015	FA-BENTOMAT ST	150	2250	3105	8421820		300075860		422436
LOT# 200145FA3 00005837	FA-BENTOMAT ST	150	2250	3437	19059421		200140VR	00002711	446142

TOTAL SQUARE FEET.....

31,500

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/06/01 9:42:19

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148668  
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ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200102FA 00000141	FA-BENTOMAT ST	150	2250	3112	8416089		200102VR	00000064	458610
LOT# 200119FA3 00001427	FA-BENTOMAT ST	150	2250	2715	18663941		200110VR	00000591	422358
LOT# 200125FA 00001878	FA-BENTOMAT ST	150	2250	2882	8445798		9115111777		423219
00001886	FA-BENTOMAT ST	150	2250	2852	8445798		9115111765		423219
LOT# 200126FA 00001990	FA-BENTOMAT ST	150	2250	2920	8493931		200117VR	00001117	453335
00002215	FA-BENTOMAT ST	150	2250	2741	18628141		200125VR	00001616	422476
00002238	FA-BENTOMAT ST	150	2250	2845	18682211		200126VR	00001712	422476
LOT# 200134FA 00004298	FA-BENTOMAT ST	150	2250	3182	01867870		200134VR	00002303	455957
00004299	FA-BENTOMAT ST	150	2250	3100	01867870		200134VR	00002303	455957
00004300	FA-BENTOMAT ST	150	2250	3103	01867870		200134VR	00002303	455957
00004477	FA-BENTOMAT ST	150	2250	3116	80007362		200133VR	00002253	454641
00004493	FA-BENTOMAT ST	150	2250	3089	80007362		A529756A		454641
LOT# 200136FA3 00004563	FA-BENTOMAT ST	150	2250	2766	18982641		300075627		454730
00004564	FA-BENTOMAT ST	150	2250	2795	18982641		300075627		454730
00004567	FA-BENTOMAT ST	150	2250	2776	18996981		300075627		454730
00004570	FA-BENTOMAT ST	150	2250	2770	18996981		300075627		454730

TOTAL SQUARE FEET.....

36,000

QCG#TF1 QCT#TF1  
11/07/01 8:43:10

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148669  
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ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200134FA3									
00003897	FA-BENTOMAT ST	150	2250	2875	18957291		200134VR	00002302	446336
00003898	FA-BENTOMAT ST	150	2250	2950	18957291		200134VR	00002302	446336
00003922	FA-BENTOMAT ST	150	2250	2958	18742131		A529701A		446336
00003923	FA-BENTOMAT ST	150	2250	2823	18742131		A529701A		446336
00003924	FA-BENTOMAT ST	150	2250	2845	18742131		A529701A		446336
00003925	FA-BENTOMAT ST	150	2250	2858	18742131		A529701A		446336
00003932	FA-BENTOMAT ST	150	2250	2893	18742131		A529710A		446336
00003933	FA-BENTOMAT ST	150	2250	2902	18742131		A529710A		446336
00003939	FA-BENTOMAT ST	150	2250	2960	18321911		A529706A		446336
00003940	FA-BENTOMAT ST	150	2250	2938	18321911		A529706A		446336
00003950	FA-BENTOMAT ST	150	2250	2953	18950361		B873545A		446336
00003951	FA-BENTOMAT ST	150	2250	2975	18950361		B873545A		446336
00003952	FA-BENTOMAT ST	150	2250	2864	18950361		B873545A		446336
00003953	FA-BENTOMAT ST	150	2250	2907	18950361		A529724A		446336
00003957	FA-BENTOMAT ST	150	2250	2855	18950361		A529724A		446336

TOTAL SQUARE FEET.....

33,750

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/06/01 15:57:28

CETCO  
GCL M&A/M&C TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148670  
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ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA 00002931	FA-BENTOMAT ST	150	2250	2946	18831901		200128VR	00001897	423104
LOT# 200133FA 00004098	FA-BENTOMAT ST	150	2250	2867	18361961		200133VR	00002234	423279
00004226	FA-BENTOMAT ST	150	2250	2988	18671671		300074519		422076
00004227	FA-BENTOMAT ST	150	2250	2943	18671671		300074519		422076
00004229	FA-BENTOMAT ST	150	2250	2933	18671671		300074519		422076
00004230	FA-BENTOMAT ST	150	2250	2880	18671671		300074519		422076
00004237	FA-BENTOMAT ST	150	2250	3040	18671671		300074514		422076
00004241	FA-BENTOMAT ST	150	2250	3027	18671671		300074514		422076
00004242	FA-BENTOMAT ST	150	2250	3018	18631531		300074514		422076
00004243	FA-BENTOMAT ST	150	2250	3020	18631531		300074514		422076
00004248	FA-BENTOMAT ST	150	2250	3039	18631531		300074533		422076
00004249	FA-BENTOMAT ST	150	2250	3074	18631531		300074533		422076
LOT# 200134FA 00004261	FA-BENTOMAT ST	150	2250	3465	18631531		300074521		422076
00004466	FA-BENTOMAT ST	150	2250	2918	80007365		200133VR	00002278	422548
LOT# 200138FA 00005263	FA-BENTOMAT ST	150	2250	3137	19014641		200136VR	00002418	446150

TOTAL SQUARE FEET.....

33,750

QCG#TF3 QCT#TF3  
11/06/01 14:45:35

CETCO  
GEOTEXTILE QC DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148665

MATERIAL	LOT#	ROLL#	GEOTEXTILE	GRAB STRENGTH
			6.0oz/sy mv ASTM D 5261	6.0 lbs marv ASTM D 4632
FA-NON-WOVEN	A529756A		6.3	169.2
FA-NON-WOVEN	200104VR	00000231	6.5	33.2
FA-NON-WOVEN	200126VR	00001674	7.1	37.2
FA-NON-WOVEN	200133VR	00002253	6.6	61.2
FA-NON-WOVEN	200133VR	00002278	6.6	47.8
FA-NON-WOVEN	200140VR	00002711	6.8	39.9
FA-NON-WOVEN	300075627		7.0	63.9
FA-NON-WOVEN	300075630		7.0	63.9
FA-NON-WOVEN	300075640		7.0	63.9
FA-NON-WOVEN	300075860		7.0	63.9

TOTAL PAGES 1



QCG#TF3 QCT#TF3  
11/06/01 14:46:14

CETCO  
GEOTEXTILE QC DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148668

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
FA-NON-WOVEN	A529756A		6.3	169.2
FA-NON-WOVEN	200110VR	00000591	7.3	67.6
FA-NON-WOVEN	200117VR	00001117	6.8	66.5
FA-NON-WOVEN	200125VR	00001616	7.2	44.0
FA-NON-WOVEN	200126VR	00001712	7.1	66.3
FA-NON-WOVEN	200133VR	00002253	6.6	61.2
FA-NON-WOVEN	200134VR	00002303	6.9	60.9
FA-NON-WOVEN	300075627		7.0	63.9
FA-NON-WOVEN	9115111765		6.5	22.7
FA-NON-WOVEN	9115111777		6.5	22.7

TOTAL PAGES 1

QCG#TF3 QCT#TF3  
11/06/01 14:46:46

CETCO  
GEOTEXTILE QC DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148670

MATERIAL	LOT#	ROLL#	GEOTEXTILE	GRAB STRENGTH
			6.0oz/sy mv ASTM D 5261	6.0 lbs marv ASTM D 4632
FA-NON-WOVEN	200128VR	00001897	6.6	42.2
FA-NON-WOVEN	200133VR	00002234	6.7	71.3
FA-NON-WOVEN	200133VR	00002278	6.6	47.8
FA-NON-WOVEN	200136VR	00002418	6.9	42.8
FA-NON-WOVEN	300074514		7.0	63.9
FA-NON-WOVEN	300074519		7.0	63.9
FA-NON-WOVEN	300074521		7.0	63.9
FA-NON-WOVEN	300074533		7.0	63.9

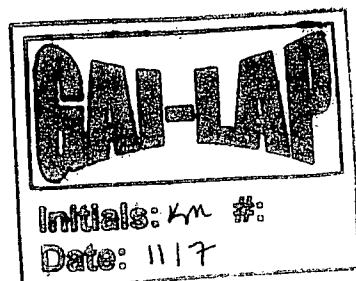
TOTAL PAGES 1



# **GEOSYNTHETIC CLAY LINER MQA TRACKING FORMS**



QCG#FT2 QCT#FT2  
11/06/01 9:41:27



CETCO

GCL QUALITY DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148665

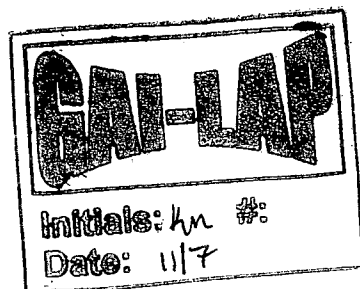
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA 0.75 lb/sqft ASTM D 5993	GRAB STRENGTH 90 lbs ASTM D 4632	PEEL STRENGTH 15 lbs ASTM D 4632
FA-BENTOMAT ST	200145FA3	00005837	.95	125.80	34.40
FA-BENTOMAT ST	200138FA3	00005015	.99	153.70	31.50
FA-BENTOMAT ST	200136FA3	00004598	.89	153.20	28.30
FA-BENTOMAT ST	200136FA3	00004571	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004568	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004562	.85	148.60	36.90
FA-BENTOMAT ST	200136FA3	00004561	.85	148.60	36.90
FA-BENTOMAT ST	200136FA3	00004560	.85	148.60	36.90
FA-BENTOMAT ST	200134FA	00004494	.90	141.50	25.90
FA-BENTOMAT ST	200134FA	00004478	.97	113.70	32.20
FA-BENTOMAT ST	200134FA	00004468	.97	113.70	32.20
FA-BENTOMAT ST	200134FA	00004467	.97	113.70	32.20
FA-BENTOMAT ST	200127FA	00002577	.88	127.10	41.30
FA-BENTOMAT ST	200113FA	00000566	1.00	92.10	36.70

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/06/01 9:42:19



CETCO

GCL QUALITY DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 00014668

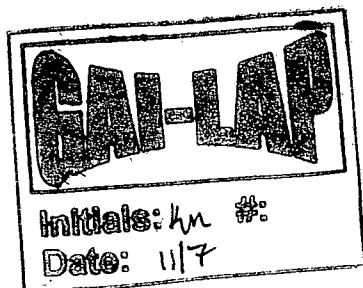
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA 0.75 lb/sqft ASTM D 5993	GRAB STRENGTH 90 lbs ASTM D 4632	PEEL STRENGTH 15 lbs ASTM D 4632
FA-BENTOMAT ST	200136FA3	00004570	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004567	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004564	.85	148.60	36.90
FA-BENTOMAT ST	200136FA3	00004563	.85	148.60	36.90
FA-BENTOMAT ST	200134FA	00004493	.90	141.50	25.90
FA-BENTOMAT ST	200134FA	00004477	.97	113.70	32.20
FA-BENTOMAT ST	200134FA	00004300	.85	129.80	40.70
FA-BENTOMAT ST	200134FA	00004299	.85	129.80	40.70
FA-BENTOMAT ST	200134FA	00004298	.85	129.80	40.70
FA-BENTOMAT ST	200126FA	00002238	.88	113.60	41.40
FA-BENTOMAT ST	200126FA	00002215	.88	173.70	42.20
FA-BENTOMAT ST	200126FA	00001990	.87*	99.90	42.00*
FA-BENTOMAT ST	200125FA	00001886	.86	200.00	30.50
FA-BENTOMAT ST	200125FA	00001878	.89	200.00	28.50
FA-BENTOMAT ST	200119FA3	00001427	.84	106.80	22.20
FA-BENTOMAT ST	200102FA	00000141	1.02	120.54	25.90

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/06/01 9:42:19



CETCO

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000146666

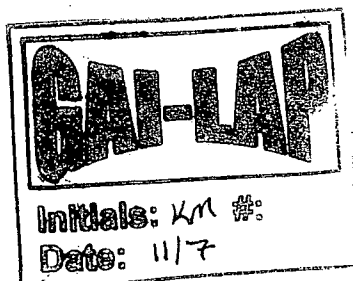
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA 0.75 lb/sqft ASTM D 5993	GRAB STRENGTH 90 lbs ASTM D 4632	PEEL STRENGTH 15 lbs ASTM D 4632
FA-BENTOMAT ST	200136FA3	00004570	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004567	.85	148.60	39.80
FA-BENTOMAT ST	200136FA3	00004564	.85	148.60	36.90
FA-BENTOMAT ST	200136FA3	00004563	.85	148.60	36.90
FA-BENTOMAT ST	200134FA	00004493	.90	141.50	25.90
FA-BENTOMAT ST	200134FA	00004477	.97	113.70	32.20
FA-BENTOMAT ST	200134FA	00004300	.85	129.80	40.70
FA-BENTOMAT ST	200134FA	00004299	.85	129.80	40.70
FA-BENTOMAT ST	200134FA	00004298	.85	129.80	40.70
FA-BENTOMAT ST	200126FA	00002238	.88	113.60	41.40
FA-BENTOMAT ST	200126FA	00002215	.88	173.70	42.20
FA-BENTOMAT ST	200126FA	00001990	.87*	99.90	42.00*
FA-BENTOMAT ST	200125FA	00001886	.86	200.00	30.50
FA-BENTOMAT ST	200125FA	00001878	.89	200.00	28.50
FA-BENTOMAT ST	200119FA3	00001427	.84	106.80	22.20
FA-BENTOMAT ST	200102FA	00000141	1.02	120.54	25.90

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/06/01 9:40:38



FAIRMOUNT CETCO

CETCO

PAGE: 1

GCL QUALITY DATA

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
- SPRING HILL FL

ORDER # 000148670

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA 0.75 lb/sqft ASTM D 5993	GRAB STRENGTH 90 lbs ASTM D 4632	PEEL STRENGTH 15 lbs ASTM D 4632
FA-BENTOMAT ST	200138FA	00005263	.86	126.10	16.10
FA-BENTOMAT ST	200134FA	00004466	.97	113.70	32.20
FA-BENTOMAT ST	200134FA	00004261	.87	129.80	25.80
FA-BENTOMAT ST	200133FA	00004249	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004248	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004243	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004242	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004241	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004237	.87	130.60	24.40
FA-BENTOMAT ST	200133FA	00004230	.84	130.60	29.40
FA-BENTOMAT ST	200133FA	00004229	.84	130.60	29.40
FA-BENTOMAT ST	200133FA	00004227	.84	130.60	29.40
FA-BENTOMAT ST	200133FA	00004226	.84	130.60	29.40
FA-BENTOMAT ST	200133FA	00004098	.84	104.40	23.30
FA-BENTOMAT ST	200129FA	00002931	.88*	132.80*	40.20*

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 07-Nov-01

TO: CETCO - CLAYMAX CORP.  
P.O. BOX 86

FAIRMOUNT, GA. 30139

ATTN: CYNTHIA WILLIX

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 446336  
as requested on your order no.

29-Jul-00

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: D.M.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 389330



# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO - CLAYMAX CORP.  
P.O. BOX 86

FAIRMOUNT, GA. 30139

ATTN: CYNTHIA WILLIX

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 446142  
as requested on your order no.

23-Jun-99

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	8.4
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.C.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 109958

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 455957  
as requested on your order no.

26-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0%	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450301

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422436  
as requested on your order no.

22-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	27
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 454996

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 423520  
as requested on your order no.

12-Mar-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	10.4
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450997

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 446150  
as requested on your order no.

21-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8.4
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.6

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 454995

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: **CETCO**  
**234 GORDON ST. S.E.**

**FAIRMOUNT, GA. 30139**

ATTN: **ALISA FINDLEY**

Dear Sirs:

A shipment of **CG 50**  
left our Lovell, WY plant on  
in **BNSF 422076**  
as requested on your order no.

**29-Jul-01**

**VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	7.6
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	16

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: **B.M.**

Approved By: **MOSES BRISENO**

**ACC**

In any correspondence regarding this shipment, please refer to our  
Order Number **450306**

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 423279  
as requested on your order no.

23-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.7
MOISTURE	ASTM D 2216	12.0% MAX.	8.4
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	13.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450304

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 423104  
as requested on your order no.

24-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	9.6
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	12.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442217



# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422548  
as requested on your order no.

03-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450314

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 455842  
as requested on your order no.

11-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.3
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	14

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442201

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 453335  
as requested on your order no.

06-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.9
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	14

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442194

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422476  
as requested on your order no.

07-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	13.6

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442195

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO - CLAYMAX CORP.  
P.O. BOX 86

FAIRMOUNT, GA. 30139

ATTN: CYNTHIA WILLIX

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 458610  
as requested on your order no.

30-May-00

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	16

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 389297

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 423219  
as requested on your order no.

22-May-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 427788

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422358  
as requested on your order no.

21-Apr-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.6
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.6

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 420970

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 454641  
as requested on your order no.

01-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.6

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450311



# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 06-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 454730  
as requested on your order no.

31-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.8
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	16

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450310



9855 Greenville Highway  
Building F  
Spartanburg, SC 29301  
800-867-5181  
fax: 864-949-6222

August 15, 2001  
REF: TNS N060  
Quantity Shipped: 12 rolls  
BOL#: 000801534  
Location: Fairmount GA

***Fairmount Cetco***  
234 Gordon Street  
Fairmount GA 30139

Dear Sir/Madam:

This is to certify that TNS N060 is a 100% polypropylene, nonwoven, needle-punched fabric. TNS N060 is resistant to degradation due to ultraviolet exposure and resists commonly encountered soil chemicals, insects, mildew, and is non-biodegradable. Polypropylene is stable within a pH range of 2 to 13. TNS N060 conforms to the physical properties listed in the following table:

<u>FABRIC PROPERTY</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>M.A.R.V</u>
Weight	ASTM D 5261	oz/sy	6.0
Thickness	ASTM D 5199	mils	120
Grab Tensile	ASTM D 4632	lbs	75
Grab Elongation (MD)	ASTM D 4632	%	90(min)
Puncture	ASTM D 4833	lbs	65

***Marshall O. Gaddy***

Marshall O. Gaddy  
Quality Control Manager

DATE: 8/15/01

TNS MILLS, INC.  
NONWOVEN QUALITY DATA  
FOR BOL# 000801534

PAGE: 1  
INQD001R

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
300074475	N060	192	135	7.3	184	97	122	113	115			81			.000	.00	
300074476	N060	192	135	7.3	184	97	122	113	115			81			.000	.00	
300074477	N060	192	135	7.3	184	97	122	113	115			81			.000	.00	
300074512	N060	192	135	6.7	170	90	122	120	111			75			.000	.00	
300074517	N060	192	135	6.7	173	91	121	115	120			80			.000	.00	
300074518	N060	192	135	6.7	173	91	121	115	120			80			.000	.00	
300074520	N060	192	135	6.5	165	85	118	105	122			76			.000	.00	
300074522	N060	192	135	6.5	165	85	118	105	122			76			.000	.00	
300074527	N060	192	135	6.2	162	87	106	115	118			68			.000	.00	
300074529	N060	192	135	6.4	166	85	117	114	125			75			.000	.00	
300074532	N060	192	135	6.4	166	85	117	114	125			75			.000	.00	
300074533	N060	192	135	6.4	166	85	117	114	125			75			.000	.00	

TOTAL NUMBER OF ROLLS 12



9855 Greenville Highway  
Building F  
Spartanburg, SC 29301  
800-867-5181  
fax: 864-949-6222

August 30, 2001  
REF: TNS N060  
Quantity Shipped: 12 rolls  
BOL#: 000801720  
Location: Fairmount GA

*Fairmount Cetco*  
234 Gordon Street  
Fairmount GA 30139

Dear Sir/Madam:

This is to certify that TNS N060 is a 100% polypropylene, nonwoven, needle-punched fabric. TNS N060 is resistant to degradation due to ultraviolet exposure and resists commonly encountered soil chemicals, insects, mildew, and is non-biodegradable. Polypropylene is stable within a pH range of 2 to 13. TNS N060 conforms to the physical properties listed in the following table:

<u>FABRIC PROPERTY</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>M.A.R.V</u>
Weight	ASTM D 5261	oz/sy	6.0
Thickness	ASTM D 5199	mils	120
Grab Tensile	ASTM D 4632	lbs	75
Grab Elongation (MD)	ASTM D 4632	%	90(min)
Puncture	ASTM D 4833	lbs	55

*Marshall O. Gaddy*

Marshall O. Gaddy  
Quality Control Manager

DATE: 8/30/01

TNS MILLS, INC.  
NONWOVEN QUALITY DATA  
FOR BOL# 000801720

PAGE: 1  
INQD001R

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
300075622	N060	192	135	6.3	164	106	89	105	127			59			.000	.00	
300075625	N060	192	135	6.4	167	107	93	97	125			73			.000	.00	
300075626	N060	192	135	6.6	170	99	96	99	123			74			.000	.00	
300075627	N060	192	135	6.6	170	99	96	99	123			74			.000	.00	
300075628	N060	192	135	6.6	170	99	96	99	123			74			.000	.00	
300075629	N060	192	135	6.6	170	98	94	92	116			71			.000	.00	
300075630	N060	192	135	6.6	170	98	94	92	116			71			.000	.00	
300075631	N060	192	135	6.6	170	98	94	92	116			71			.000	.00	
300075634	N060	192	135	6.3	170	91	102	100	110			63			.000	.00	
300075635	N060	192	135	6.3	170	91	102	100	110			63			.000	.00	
300075636	N060	192	135	6.4	164	101	97	101	114			66			.000	.00	
300075640	N060	192	135	6.6	170	97	94	100	114			67			.000	.00	

TOTAL NUMBER OF ROLLS 12



9855 Greenville Highway  
Building F  
Spartanburg, SC 29301  
800-867-5181  
fax: 864-948-6222

August 20, 2001  
REF: TNS N060  
Quantity Shipped: 10 rolls  
BOL#: 000801573  
Location: Fairmount GA

**Fairmount Cetco**  
234 Gordon Street  
Fairmount GA 30139

Dear Sir/Madam:

This is to certify that TNS N060 is a 100% polypropylene, nonwoven, needle-punched fabric. TNS N060 is resistant to degradation due to ultraviolet exposure and resists commonly encountered soil chemicals, insects, mildew, and is non-biodegradable. Polypropylene is stable within a pH range of 2 to 13. TNS N060 conforms to the physical properties listed in the following table:

<u>FABRIC PROPERTY</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>M.A.R.V</u>
Weight	ASTM D 5261	oz/sy	6.0
Thickness	ASTM D 5199	mils	120
Grab Tensile	ASTM D 4632	lbs	75
Grab Elongation (MD)	ASTM D 4632	%	90(min)
Puncture	ASTM D 4833	lbs	65

**Marshall O. Gaddy**

Marshall O. Gaddy  
Quality Control Manager

DATB: 8/20/01

TNS MILLS, INC.  
NONWOVEN QUALITY DATA  
FOR BOL# 000801573

ROLL #	STYL	WDT	LG	FAER WCHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BHST STRG	FLOW RATE	PERK -ABL	PERM -ITY	AOS
300074497	N060	192	135	6.7	176	87	93	102	133			70			.000	.00	
300074498	N060	192	135	6.7	176	87	93	102	133			70			.000	.00	
300074499	N060	192	135	6.7	176	87	93	102	133			70			.000	.00	
300074513	N060	192	135	6.7	170	90	122	120	111			75			.000	.00	
300074514	N060	192	135	6.6	169	87	123	115	116			79			.000	.00	
300074519	N060	192	135	6.7	173	91	121	115	120			80			.000	.00	
300074521	N060	192	135	6.5	165	85	118	105	122			76			.000	.00	
300074525	N060	192	135	6.2	162	87	106	115	118			68			.000	.00	
300074528	N060	192	135	6.2	162	87	106	115	118			68			.000	.00	
300074542	N060	192	135	6.4	166	85	117	114	125			75			.000	.00	

TOTAL NUMBER OF ROLLS 10



9855 Greenville Highway  
Building F  
Spartanburg, SC 29301  
800-867-5181  
fax: 864-949-6222

September 13, 2001  
REF: TNS N060  
Quantity Shipped: 15 rolls  
BOL#: 000801908  
Location: Fairmount GA

***Fairmount Cetco***  
234 Gordon Street  
Fairmount GA 30139

Dear Sir/Madam:

This is to certify that TNS N060 is a 100% polypropylene, nonwoven, needle-punched fabric. TNS N060 is resistant to degradation due to ultraviolet exposure and resists commonly encountered soil chemicals, insects, mildew, and is non-biodegradable. Polypropylene is stable within a pH range of 2 to 13. TNS N060 conforms to the physical properties listed in the following table:

<u>FABRIC PROPERTY</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>M.A.R.V</u>
Weight	ASTM D 5261	oz/sy	6.0
Thickness	ASTM D 5199	mils	120
Grab Tensile	ASTM D 4632	lbs	75
Grab Elongation (MD)	ASTM D 4632	%	90(min)
Puncture	ASTM D 4833	lbs	55

***Marshall O. Gaddy***  
Marshall O. Gaddy  
Quality Control Manager



DATE: 9/13/01

TNS MILLS, INC.  
NONWOVEN QUALITY DATA  
FOR BOL# 000801908

PAGE: 1  
INQD001R

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
300075597	N060	192	135	6.6	172	92	98	103	121			78			.000	.00	
300075623	N060	192	135	6.3	164	106	89	105	127			59			.000	.00	
300075632	N060	192	135	6.6	170	98	94	92	116			71			.000	.00	
300075641	N060	192	135	6.6	170	97	94	100	114			67			.000	.00	
300075642	N060	192	135	6.6	170	97	94	100	114			67			.000	.00	
300075653	N060	192	135	6.4	166	89	103	103	119			67			.000	.00	
300075859	N060	192	135	6.7	151	124	139	105	120			68			.000	.00	
300075860	N060	192	135	6.7	151	124	139	105	120			68			.000	.00	
300075861	N060	192	135	6.6	157	101	141	112	117			86			.000	.00	
300075876	N060	192	135	6.6	173	105	111	105	125			90			.000	.00	
300075878	N060	192	135	6.6	166	111	128	116	123			90			.000	.00	
300075879	N060	192	135	6.6	166	111	128	116	123			90			.000	.00	
300075883	N060	192	135	6.5	164	93	118	106	123			84			.000	.00	
300075886	N060	192	135	6.6	165	96	122	107	125			86			.000	.00	
300075887	N060	192	135	6.6	165	96	122	107	125			86			.000	.00	

TOTAL NUMBER OF ROLLS 15

## BNMAT6OZ Certification



Cetco  
234 Gordon Gordon Street  
Fairmount, GA 30139

Order#: 83224

Fax#: 706-337-7334

This is to certify that BNMAT6OZ is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. BNMAT6OZ is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

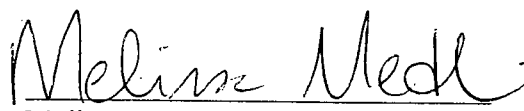
Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	.29 (65)	.29 (65)
Grab Tensile Elongation	ASTM D 4632	%	90	90
Puncture Strength	ASTM D 4833	kN (lbs)	.27 (60)	
Thickness	ASTM D 5199	mils	3.0 (120)	
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	203 (6.0)	

\* Certification based on independent lab testing.

Sworn and subscribed before me this 22<sup>nd</sup> day of May, 2001

  
Linda Evans

My commission expires December 8, 2001

  
Melissa Medlin

Quality Manager

Unless specified separately in writing, material results apply only to items tested. No portion of this document may be reproduced whole or in part without the expressed written consent of TC Mirafi. TC Mirafi warrants our products and services to be free from defects in material and workmanship when delivered to TC Mirafi's customers and that our products meet our published specifications.





*MBM*

### Geotextile Properties

Roll#	Style	Weight ASTM D5261	Grab Tensile MD ASTM D4632	Elongation MD ASTM D4632	Grab Tensile XMD ASTM D4632	Elongation XMD ASTM D4632	Trap Tear MD ASTM D4533	Trap Tear XMD ASTM D4533	Puncture ASTM D4833	Burst ASTM D3786	AOS ASTM D4751	Thickness ASTM D5199	Flow Rate ASTM D4491	Permeability ASTM D4491	Permittivity ASTM D4491
		Oz/Sy	lbs	%	lbs	%	lbs	lbs	lbs	psi	US Std Sieve	mils	gal/ min/ sf	cm/sec	sec-1
9115111764	BNMAT6OZ	6.7	96	104	150	126			89			140			
9115111765	BNMAT6OZ	6.7	96	104	150	126			89			140			
9115111766	BNMAT6OZ	6.7	96	104	150	126			89			140			
9115111767	BNMAT6OZ	6.5	109	91	161	113			88			135			
9115111769	BNMAT6OZ	6.5	109	91	161	113			88			135			
9115111773	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111774	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111775	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111776	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111777	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111778	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111779	BNMAT6OZ	6.7	105	99	158	139			84			140			
9115111780	BNMAT6OZ	7.0	112	100	172	124			90			153			
9115111788	BNMAT6OZ	6.5	110	104	173	130			84			144			
9115111789	BNMAT6OZ	6.5	110	104	173	130			84			144			
9115111796	BNMAT6OZ	6.5	110	104	173	130			84			144			

**Rolls with roll numbers ending in "A", "B", "C", etc. are final "put-up" rolls taken from a single master roll and having identical properties and test data.**

**Results may only be available for tested rolls.**

Unless specified separately in writing, material results apply only to items tested. No portion of this document may be reproduced whole or in part without the expressed written consent of TC Mirafi. TC Mirafi warrants our products and services to be free from defects in material and workmanship when delivered to TC Mirafi's customers and that our products meet our published specifications.

Order#

83224

Page 1 of 1



8/24/2001

American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80119856 PO 4357  
Ref:

This is to certify that Product GEOTEX 650, a nonwoven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level. This geotextile has been continuously inspected for the presence of needles and none were detected.

<u>Physical Property</u>	<u>Test Method</u>	<u>US Units</u>		<u>SI Unit</u>	
Mass Per Unit Area	ASTM D-5261	6.0	oz/yd <sup>2</sup>	(203.4)	g/m <sup>2</sup>
Thickness	ASTM D-5199	120	mils	(3.048)	mm
Tensile Strength	ASTM D-4632	45	lbs	(200.25)	N
Elongation	ASTM D-4632	90	%	90	%
Trapezoidal Tear	ASTM D-4533	25	lbs	(111.25)	N
Mullen Burst	ASTM D-3786	190	psi	(1309.8)	kPa
Puncture Strength	ASTM D-4833	50	lbs	(222.5)	N
A.O.S.	ASTM D-4751		Sieve		mm
Permittivity	ASTM D-4491		sec-1		sec-1
Permeability	ASTM D-4491		cm/sec		cm/sec
Water Flow Rate	ASTM D-4491		gpm/ft <sup>2</sup>	( )	lpm/m <sup>2</sup>
UV Resistance	ASTM D-4355		%		%

Strength Retained after 500 hours exposure in Xenon Arc Weatherometer

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

1/23/2001

**Individual Roll Data**  
**Bill of Lading 80119856**

Roll #	Style	Batch	Weight	Thick	Tensile		Elongation		T.Tear		Burst	Punct
			Osyl	mils	MD	XMD	MD	XMD	MD	XMD		
			D5261	D5199	lbs	lbs	%	%	lbs	lbs	psi	lbs
					D4632	D4632	D4632	D4632	D4533	D4533	D3786	D4833
A529736A	650	51583	6.8	129	83	130	121	108	32	34	233	57
A529755A	650	51583	7.6	133	72	179	116	98	32	50	237	99
A529760A	650	51583	7.1	133	78	129	117	114	36	47	224	88

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX nonwoven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our nonwoven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of nonwoven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped and rolls listed may or may not be the actual rolls tested. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



901 S. Delphine Ave.  
Waynesboro, Va. 22980

August 22, 2001

Colloid Environmental Technologies Co.

**Attn: Kelly Miller**  
PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 528018

Dear Kelly:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Jz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*22<sup>nd</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



		ASTM D-4632	ASTM D-4632	ASTM D-5261
		Grab Tensile	Elongation	
		(LBS) Warp	% Warp	oz/per sq. yd.
<u>Roll Number</u>				
<b>14802</b>				
1.	80007354	120.50	25.02	3.62
2.	80007356	123.50	26.59	3.56
3.	80007357	129.20	25.99	3.61
4.	80007358	126.00	26.48	3.83
5.	80007359	120.20	27.28	3.63
6.	80007360	121.30	27.07	3.58
7.	80007361	122.70	25.94	3.58
8.	80007362	118.30	25.92	3.36
9.	80007364	122.90	25.84	3.63
10.	80007365	127.40	25.14	3.57
11.	80007366	122.40	26.47	3.54
12.	80007367	118.80	26.87	3.54
13.	80007368	119.80	28.23	3.60
14.	80007369	120.00	26.17	3.57
15.	80007370	118.80	29.72	3.63
16.	80007371	119.90	27.31	3.54
17.	80007372	121.40	25.01	3.58
18.	80007373	129.50	26.36	3.59
19.	80007374	122.70	25.87	3.57
20.	80007376	120.60	26.33	3.63
21.	80007377	126.30	26.88	3.60
22.	80007378	125.30	24.62	3.62
23.	80007379	118.80	26.11	3.57
24.	80007380	123.40	25.58	3.42



901 S. Delphine Ave.  
Waynesboro, Va. 22980

**Wayn-Tex Inc.**®



August 16, 2001

Colloid Environmental Technologies Co.

**Attn: Cynthia Willix**

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527973

Dear Cynthia:

This is to certify that Styles 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

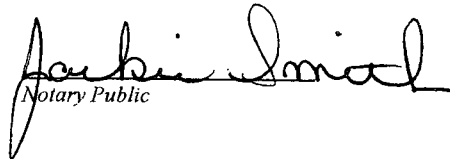
Sincerely,

*Phyllis M. Colvin*

*Commonwealth of Virginia  
City of Waynesboro*

*Given under my hand this  
16<sup>th</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.





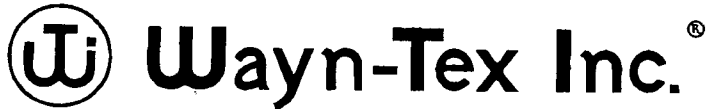
		ASTM D-4632 Grab Tensile	ASTM D-4632 Elongation	ASTM D-5261
<u>14802</u>				
1.	01836044	112.00	25.40	3.58
2.	01843873	115.60	23.44	3.83
3.	01867870	114.00	24.00	3.92
4.	01868259	122.37	28.38	3.91
5.	01868526	117.23	29.88	3.60
6.	01870676	114.10	25.06	3.57
7.	01872187	114.00	24.00	3.29
8.	01877023	116.74	24.93	3.67
9.	01883078	124.00	28.00	4.10
10.	01893755	126.87	26.83	3.63
11.	01895289	122.37	28.38	3.91
12.	18100761	113.80	23.09	3.47
13.	18321911	118.30	24.56	3.64
14.	18336371	115.10	24.00	3.80
15.	18338861	111.50	23.84	3.59
16.	18469501	125.70	25.24	3.73
17.	18509631	120.10	26.04	3.61
18.	18605941	123.20	27.16	3.59
19.	18625301	115.00	26.00	3.61
20.	18631531	116.00	27.00	3.74
21.	18631871	116.00	26.00	3.54
22.	18657711	124.00	28.00	4.10
23.	18670851	121.20	29.18	3.62
24.	18671671	112.00	25.00	3.54
25.	18686461	117.73	25.24	3.76
26.	18698651	112.00	24.00	3.51
27.	18707181	114.00	24.00	3.56
28.	18738281	118.70	25.29	3.72
29.	18742131	123.50	27.29	3.45
30.	18896601	126.00	25.00	3.37
31.	18944091	127.03	26.61	3.70
32.	18949861	115.60	26.52	3.60
33.	18950361	122.77	25.24	3.70



**Wayn-Tex Inc.®**



34.	18954641	120.70	30.82	3.54
35.	18957141	123.00	26.00	3.41
36.	18957151	109.60	25.00	3.45
37.	18957291	114.27	25.36	3.50
38.	18962661	124.73	24.61	3.56
39.	18963281	134.30	25.61	3.50



901 S. Delphine Ave.  
Waynesboro, Va. 22980

March 8, 2001—Revised 8/17/01

Colloid Environmental Technologies Co.

Attn: Cynthia Willix  
PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 526880

Dear Cynthia:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*17<sup>th</sup> day of August 2001.*

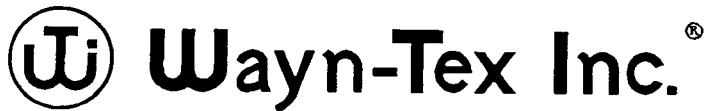
Phyllis M. Colvin  
Quality Systems Administrator

\_\_\_\_\_  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



	<u>Roll Number</u>	<u>ASTM D-4632 Grab Tensile (LBS) Warp</u>	<u>ASTM D-4632 Elongation % Warp</u>	<u>ASTM D-5261 oz/per sq. yd.</u>
<b><u>14700</u></b>				
1.	18457311	128.00	26.29	3.67
2.	18466381	122.50	24.70	3.37
3.	18473131	126.90	25.82	3.67
4.	18499321	137.00	27.33	3.76
5.	18506251	132.80	25.28	3.49
<b><u>14802</u></b>				
6.	01843548	111.53	23.85	3.59*
7.	01846052	120.90	23.93	3.47*
8.	18301921	118.03	24.99	3.57*
9.	18302171	115.43	24.80	3.75
10.	18307471	115.70	24.85	3.80*
11.	18337251	123.50	23.33	3.76*
12.	18373871	121.43	26.00	3.52*
13.	18437111	111.53	23.85	3.59*
14.	18458491	122.73	25.64	3.70*
15.	18459421	123.17	25.45	3.79*
16.	18459601	117.80	24.26	3.42*
17.	18461621	126.90	24.69	3.83*
18.	18464721	124.90	25.60	3.78*
19.	18467801	125.00	27.00	3.70
20.	18468821	117.90	23.91	3.27
21.	18469321	123.50	25.29	3.34
22.	18478521	120.00	24.00	3.61
23.	18478721	125.00	25.00	3.50
24.	18484091	122.00	25.73	3.40
25.	18484641	120.70	26.17	3.57
26.	18487301	117.60	27.39	3.54
27.	18487501	132.40	28.76	3.75



901 S. Delphine Ave.  
Waynesboro, Va. 22980



August 29, 2001

Colloid Environmental Technologies Co.

Attn: Kelly Miller  
PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 528082

Dear Kelly:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

**PHYSICAL PROPERTY**

TENSILE STRENGTH

ELONGATION

2/Sq. Yd

**TEST METHOD**

ASTM D-4632

ASTM D-4632

ASTM D-5261

**US UNITS**

109 LBS

20%

3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

Commonwealth of Virginia  
City of Waynesboro

Given under my hand this  
29<sup>th</sup> day of August 2001.

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

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# Wayn-Tex Inc.®



<u>Roll Number</u>		ASTM D-4632 Grab Tensile (LBS) Warp	ASTM D-4632 Elongation % Warp	ASTM D-5261 oz/per sq. yd.
<u>14802</u>				
1.	18975171	115.90	24.46	3.40
2.	18982641	117.00	25.00	3.59
3.	18982771	114.00	25.00	3.69
4.	18997031	119.00	24.00	3.70



901 S. Delphine Ave.  
Waynesboro, Va. 22980

October 1, 2001

Colloid Environmental Technologies Co.

Attn: Kelly Miller  
PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 528324

Dear Kelly:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

Commonwealth of Virginia  
City of Waynesboro

Given under my hand this  
1<sup>st</sup> day of October 2001.

Phyllis M. Colvin  
Quality Manager

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



	<u>Roll Number</u>	<u>ASTM D-4632</u> <u>Grab Tensile</u> <u>(LBS) Warp</u>	<u>ASTM D-4632</u> <u>Elongation</u> <u>% Warp</u>	<u>ASTM D-5261</u> <u>oz/per sq. yd.</u>
<u>14802</u>				
1.	19039141	125.00	26.00	3.60
2.	19039501	115.90	22.96	3.54
3.	19041491	123.00	24.00	3.70
4.	1904379	115.70	23.89	3.54
5.	1904521	119.90	25.48	3.81
6.	19047431	113.00	22.00	3.66
7.	1904845	118.00	25.50	3.53
8.	19049511	116.00	26.00	3.57
9.	19050121	117.00	24.00	3.42
10.	19051301	122.70	26.83	3.41
11.	19052541	116.00	25.00	3.49
12.	19053231	123.00	25.00	4.07
13.	19058521	117.50	26.40	3.40
14.	19058731	116.00	25.00	3.71
15.	19059201	119.70	24.84	3.63
16.	19059261	122.37	25.11	3.40
17.	19059421	125.00	27.00	3.71
18.	19061651	122.00	27.00	3.63
19.	19062981	119.00	26.00	3.82
20.	19064231	119.00	27.00	3.99
21.	19066191	117.00	25.00	3.70
22.	19066611	119.00	24.00	3.78
23.	19066871	119.00	25.00	3.48
24.	19067181	119.00	23.00	3.68
25.	19067221	118.00	26.00	3.45
26.	19067931	114.00	24.72	3.65
27.	19068621	117.30	25.29	3.65





901 S. Delphine Ave.  
Waynesboro, Va. 22980

**Wayn-Tex Inc.**®



August 16, 2001

Colloid Environmental Technologies Co.

**Attn: Cynthia Willix**

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527973

Dear Cynthia:

This is to certify that Styles 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

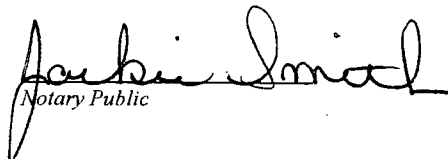
Sincerely,

*Phyllis M. Colvin*

*Commonwealth of Virginia  
City of Waynesboro*

*Given under my hand this  
16<sup>th</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

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		ASTM D-4632 Grab Tensile	ASTM D-4632 Elongation	ASTM D-5261
<u>14802</u>				
1.	01836044	112.00	25.40	3.58
2.	01843873	115.60	23.44	3.83
3.	01867870	114.00	24.00	3.92
4.	01868259	122.37	28.38	3.91
5.	01868526	117.23	29.88	3.60
6.	01870676	114.10	25.06	3.57
7.	01872187	114.00	24.00	3.29
8.	01877023	116.74	24.93	3.67
9.	01883078	124.00	28.00	4.10
10.	01893755	126.87	26.83	3.63
11.	01895289	122.37	28.38	3.91
12.	18100761	113.80	23.09	3.47
13.	18321911	118.30	24.56	3.64
14.	18336371	115.10	24.00	3.80
15.	18338861	111.50	23.84	3.59
16.	18469501	125.70	25.24	3.73
17.	18509631	120.10	26.04	3.61
18.	18605941	123.20	27.16	3.59
19.	18625301	115.00	26.00	3.61
20.	18631531	116.00	27.00	3.74
21.	18631871	116.00	26.00	3.54
22.	18657711	124.00	28.00	4.10
23.	18670851	121.20	29.18	3.62
24.	18671671	112.00	25.00	3.54
25.	18686461	117.73	25.24	3.76
26.	18698651	112.00	24.00	3.51
27.	18707181	114.00	24.00	3.56
28.	18738281	118.70	25.29	3.72
29.	18742131	123.50	27.29	3.45
30.	18896601	126.00	25.00	3.37
31.	18944091	127.03	26.61	3.70
32.	18949861	115.60	26.52	3.60
33.	18950361	122.77	25.24	3.70



**Wayn-Tex Inc.**®



34.	18954641	120.70	30.82	3.54
35.	18957141	123.00	26.00	3.41
36.	18957151	109.60	25.00	3.45
37.	18957291	114.27	25.36	3.50
38.	18962661	124.73	24.61	3.56
39.	18963281	134.30	25.61	3.50



901 S. Delphine Ave.  
Waynesboro, Va. 22980

August 2, 2001 ---Revised 8/17/01

Colloid Environmental Technologies Co.

Attn: Cynthia Willix

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527857

Dear Cynthia:

This is to certify that Styles 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*17<sup>th</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes so warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



		ASTM D-4632 Grab Tensile	ASTM D-4632 Elongation	ASTM D-5261
<b>14802</b>				
1.	18040461	124.47	21.64	3.23*
2.	18351501	121.43	26.00	3.52*
3.	18351751	125.80	27.29	4.01*
4.	18361961	115.07	24.70	3.80*
5.	18386051	115.90	28.13	3.70*
6.	18386111	121.43	26.00	3.52*
7.	18510961	117.90	26.98	3.66
8.	18511531	126.80	27.26	3.72
9.	18627811	113.00	25.00	3.61
10.	18645751	112.53	23.99	3.48
11.	18671341	119.00	26.93	3.74
12.	18691951	112.70	25.69	3.89
13.	18693001	118.00	25.00	3.54
14.	18710831	116.00	29.00	3.75
15.	18711431	117.00	27.00	3.67
16.	18711891	113.00	26.00	3.76
17.	18717251	117.00	26.00	3.65
18.	18721251	117.00	27.00	3.65
19.	18729301	122.00	27.00	3.69
20.	18737291	112.27	24.57	3.51
21.	18742891	111.80	27.90	3.44
22.	18744261	118.00	25.00	3.56
23.	18761101	115.00	25.00	3.70
24.	18914011	113.10	22.93	3.59
25.	18914911	120.00	25.00	3.76
26.	18915591	110.10	25.60	3.71
27.	18921691	123.20	25.77	3.68
28.	18922041	121.26	26.00	3.53
29.	18922921	119.10	26.29	3.45



901 S. Delphine Ave.  
Waynesboro, Va. 22980

July 9, 2001

Colloid Environmental Technologies Co.

Attn: Alisa Fiendley

PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527679

Dear Alisa:

This is to certify that Styles 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*9<sup>th</sup> day of July 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes so warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



<u>14802</u>		ASTM D-4632 Grab Tensile	ASTM D-4632 Elongation	ASTM D-5261
1.	01872024	117.80	27.23	3.49
2.	18498061	130.60	26.30	3.61
3.	18569721	116.00	25.00	3.59
4.	18571731	122.00	26.00	4.24
5.	18575301	114.30	25.17	3.37
6.	18576481	124.13	26.07	3.61
7.	18576511	120.30	25.98	3.61
8.	18576731	114.40	25.91	3.83
9.	18576971	116.60	25.59	3.56
10.	18580001	122.30	25.97	3.70
11.	18582211	124.20	26.61	3.73
12.	18583971	119.00	25.00	3.49
13.	18583991	114.00	24.00	3.65
14.	18587141	120.00	26.00	3.61
15.	18587921	118.70	24.31	3.75
16.	18605141	124.70	27.54	3.45
17.	18624991	127.00	26.00	3.76
18.	18628421	122.00	27.00	3.69
19.	18640781	114.00	22.00	3.26
20.	18643771	112.00	23.00	3.62
21.	18669541	112.00	24.00	3.49
22.	18684961	117.20	29.88	3.60
23.	18685421	113.00	26.00	3.47
24.	18707111	111.00	26.00	3.52
25.	18715041	114.00	26.00	3.57
26.	18716341	119.00	27.00	3.54
27.	18721371	117.00	26.00	3.61
28.	18784971	122.00	25.00	3.36
29.	18792861	112.70	26.56	3.53
30.	18828161	117.00	28.00	3.74
31.	18831901	114.00	24.00	3.62
32.	18835091	115.00	26.00	3.36

• VALUES PER RANDOM SAMPLES



901 S. Delphine Ave.  
Waynesboro, Va. 22980

**Wayn-Tex Inc.**®



May 4, 2001--- Revised 8/17/01

Colloid Environmental Technologies Co.

Attn: Kelly Miller

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527305

Dear Kelly:

This is to certify that Style 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*17<sup>th</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes so warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.





# Wayn-Tex Inc.®



<u>Roll Number</u>		ASTM D-4632 Grab Tensile (LBS) Warp	ASTM D-4632 Elongation % Warp	ASTM D-5261 oz/per sq. yd.
<b>14802</b>				
1.	01863761	121.00	24.00	3.69
2.	<b>18054251</b>	<b>112.50</b>	<b>25.33</b>	<b>3.65*</b>
3.	<b>18122781</b>	<b>112.50</b>	<b>25.33</b>	<b>3.65*</b>
4.	18529571	115.00	25.00	3.78
5.	18530451	127.00	27.00	3.79
6.	18616411	114.60	22.99	3.83
7.	18621541	119.00	26.00	4.00
8.	18632831	124.70	26.39	3.67
9.	18633761	109.00	27.00	3.56
10.	18634491	119.00	26.00	3.76
11.	18636181	116.00	24.00	3.53
12.	18636841	119.00	26.00	3.83
13.	18637601	117.00	24.00	3.56
14.	18637651	116.00	25.00	3.54
15.	18638711	116.00	24.00	3.60
16.	18643321	120.00	26.00	3.56
17.	18644821	114.20	24.24	3.77
18.	18646421	117.30	24.43	3.63
19.	18649951	113.00	22.00	3.52
20.	18653481	122.00	25.22	3.64
21.	18654711	109.30	26.37	3.61
22.	18657621	113.00	25.00	3.51
23.	18661031	119.20	27.18	3.90
24.	18661121	114.20	27.80	3.70
25.	18661831	117.00	26.00	3.81
26.	18662311	117.10	24.78	3.51
27.	18662631	113.60	26.11	3.61
28.	18662921	115.00	23.80	3.49
29.	18663941	115.20	27.63	3.78
30.	18668581	110.10	23.33	3.50

• VALUES PER RANDOM SAMPLES



**Wayn-Tex Inc.**®

901 S. Delphine Ave.  
Waynesboro, Va. 22980

June 26, 2001

Colloid Environmental Technologies Co.

**Attn: Alisa Fiendley**

PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 527649

Dear Alisa:

This is to certify that Styles 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*26<sup>th</sup> day of June 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes so warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



<u>14802</u>		ASTM D-4632 Grab Tensile	ASTM D-4632 Elongation	ASTM D-5261
1.	18569241	118.00	26.00	3.48
2.	18615521	115.60	25.77	3.56
3.	18625581	112.00	27.00	3.38
4.	18628141	119.00	27.00	3.40
5.	18629561	110.80	26.91	3.63
6.	18635331	115.90	26.92	3.77
7.	18637961	112.00	25.00	3.69
8.	18663121	110.90	23.33	3.35
9.	18673741	115.00	25.00	3.62
10.	18675241	116.00	22.00	3.62
11.	18675811	112.00	24.00	3.83
12.	18677971	120.00	26.00	3.78
13.	18678091	112.00	25.00	3.63
14.	18678171	116.00	24.00	3.54
15.	18679411	113.60	25.32	3.58
16.	18681081	114.00	27.00	3.52
17.	18682211	115.60	26.52	3.53
18.	18702351	124.00	27.79	3.43
19.	18717381	110.00	24.00	3.48
20.	18718751	117.10	26.18	3.72
21.	18721151	114.00	26.00	3.45
22.	18730601	118.00	26.00	3.73
23.	18737661	115.50	26.68	3.56
24.	18738731	115.20	26.23	3.62
25.	18767461	121.00	27.00	3.61
26.	18768061	119.60	27.20	3.60
27.	18768211	115.00	25.00	3.65
28.	18783421	122.00	26.00	3.66
29.	18818181	122.00	26.00	3.83
30.	18826771	109.00	23.00	3.65

• VALUES PER RANDOM SAMPLES



901 S. Delphine Ave.  
Waynesboro, Va. 22980

August 28, 2001

Colloid Environmental Technologies Co.

Attn: Kelly Miller  
PO. Box 88

234 Gordon Street  
Fairmount, GA 30139

RE: Bill of Lading 528070

Dear Kelly:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*28<sup>th</sup> day of August 2001.*

Phyllis M. Colvin  
Quality Systems Administrator

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



<u>Roll Number</u>		ASTM D-4632 Grab Tensile (LBS) Warp	ASTM D-4632 Elongation % Warp	ASTM D-5261 oz/per sq. yd.
<b>14802</b>				
1.	01875275	121.00	27.00	3.36
2.	01898673	116.40	25.92	3.65
3.	18974581	118.00	24.00	3.32
4.	18976421	112.77	25.43	3.49
5.	18979681	120.20	24.47	3.71
6.	18984141	119.50	25.98	3.80
7.	1898456	114.00	25.00	3.20
8.	1898464	117.00	24.00	3.68
9.	1898477	125.15	26.53	3.80
10.	1898509	114.00	26.01	3.64
11.	1898521	115.50	25.47	3.85
12.	1898563	118.70	26.27	3.66
13.	1898608	114.00	25.00	3.32
14.	1898611	118.00	26.01	3.57
15.	1898615	118.50	25.50	3.41
16.	1898700	117.50	27.00	3.66
17.	18991671	112.50	24.23	3.51
18.	18992251	114.00	26.27	3.36
19.	18996551	118.00	26.85	3.81
20.	18996981	114.00	25.00	3.62
21.	18998141	110.60	26.18	3.59
22.	18998601	110.00	25.44	3.50
23.	18998671	112.70	26.97	3.66
24.	18998981	113.00	25.00	3.51
25.	19000061	120.00	26.00	3.81
26.	19000481	122.00	26.00	3.40
27.	19000541	118.00	27.00	3.73
28.	1900055	110.00	25.00	3.59
29.	1900063	117.00	24.00	3.53



901 S. Delphine Ave.  
Waynesboro, Va. 22980

September 5, 2001

Colloid Environmental Technologies Co.

**Attn: Kelly Miller**  
PO. Box 88

**234 Gordon Street**  
Fairmount, GA 30139

RE: Bill of Lading 528148

Dear Kelly:

This is to certify that Style 14700 and 14802 a woven polypropylene fabric produced by Wayn-Tex, Inc., will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 95 percent confidence level.

<u>PHYSICAL PROPERTY</u>	<u>TEST METHOD</u>	<u>US UNITS</u>
TENSILE STRENGTH	ASTM D-4632	109 LBS
ELONGATION	ASTM D-4632	20%
Oz/Sq. Yd	ASTM D-5261	3.20 min.

\* VALUES PER RANDOM SAMPLES

Sincerely,

*Commonwealth of Virginia*  
*City of Waynesboro*

*Given under my hand this*  
*5<sup>th</sup> day of September 2001.*

Phyllis M. Colvin  
Quality Manager

  
Notary Public

Enclosure: 1

cc: G. Foster

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than that it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND, TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes so warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this product and is subject to change without notice.



	<u>Roll Number</u>	<u>ASTM D-4632</u> <u>Grab Tensile</u> <u>(LBS) Warp</u>	<u>ASTM D-4632</u> <u>Elongation</u> <u>% Warp</u>	<u>ASTM D-5261</u> <u>oz/per sq. yd.</u>
<b>14802</b>				
1.	01901002	120.80	24.93	3.66
2.	01901120	117.20	25.04	3.60
3.	19006691	120.00	23.00	3.49
4.	19006951	122.00	26.00	3.78
5.	19007251	110.00	25.00	3.54
6.	19008091	112.00	23.00	3.54
7.	19008541	121.00	24.00	3.66
8.	19008981	114.00	25.00	3.40
9.	19009991	115.00	26.00	3.49
10.	19010111	120.00	26.00	3.69
11.	19010161	112.00	26.00	3.62
12.	19011941	117.00	26.00	3.66
13.	19014031	119.10	23.91	3.62
14.	19014641	116.10	25.88	3.41
15.	19016551	109.00	22.00	3.79
16.	19016601	113.00	27.00	3.47
17.	19016671	119.00	25.00	3.57



American Colloid-Fairmount, GA  
 Kelly Miller  
 P.O. Box 88  
 Fairmont GA 30139  
 BOL 80123490 PO  
 Ref:

9/19/2001

This is to certify that Product **82TEX**, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd <sup>2</sup> - (g/m <sup>2</sup> )	3.20	(108.48)
Thickness	ASTM D-5199 mils - (m)	16	(0.4064)
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	155 X 135	(689.75) X (600.75)
Elongation	ASTM D-4632 %	15 X 15	
Trapezoidal Tear	ASTM D-4533 lb - (N)	45 X 45	(200.25) X (200.25)
Mullen Burst	ASTM D-3786 psi - (Kpa)	265	(1826.91)
Puncture Strength	ASTM D-4833 lb - (N)	70	(311.5)
AOS	ASTM D-4751 US Sieve - (mm)	40	0.425
Permittivity	ASTM D-4491 SEC-1	0.08	
Permeability -	ASTM D-4491 cm - (sec)	0.004	
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m <sup>2</sup> )	6	(244.4682)
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
 Regional Engineer  
 SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supercedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

11/1/2000



**Synthetic Industries**  
**Individual Roll Data**  
**Bill of Lading 80123490**

Page 1

Roll #	Style	Weight	Tensile		Elongation		T.Tear		Burst
		Osy	W	F	W	F	W	F	
		D5261	lbs	lbs	%	%	lbs	lbs	
			D4632	D4632	D4632	D4632	D4533	D4533	
8703215	82TEX	3.4	155	143	16	15	61	82	350

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX nonwoven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our nonwoven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

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OCT-02-2001 12:30

S I CORP

1423 553 2108

P.04



American Colloid-Fairmount, GA  
Alisa Findley  
P.O. Box 88  
Fairmont GA 30139  
BOL 80109618 PO 0-OCW-31354  
Ref:

6/22/2001

This is to certify that Product 82TEX, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	3.20	(108.48)
Thickness	ASTM D-5199 mils - (m)	16	(0.4064)
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	135 X 135	(600.75 X (600.75)
Elongation	ASTM D-4632 %	15 X 15	
Trapezoidal Tear	ASTM D-4533 lb - (N)	45 X 45	(200.25 X (200.25)
Mullen Burst	ASTM D-3786 psi - (Kpa)	265	(1826.9
Puncture Strength	ASTM D-4833 lb - (N)	70	(311.5)
AOS	ASTM D-4751 US Sieve - (mm)	40	0.425
Permittivit	ASTM D-4491 SEC-1	0.08	
Permeability -	ASTM D-4491 cm - (sec	0.004	
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)	6	(244.46
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

Frank P. Pace, P.E.  
Manager - Engineering Services  
SI Geosolutions

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6/22/2001

Synthetic Industries

Page

**Individual Roll Data**  
**Bill of Lading 80109618**

Roll #	Style	Weight	Tensile		Elongation		T.Tear		Burst
			W	F	W	F	W	F	
		Osy D5261	lbs D4632	lbs D4632	% D4632	% D4632	lbs D4533	lbs D4533	
8484798	82TEX	3.6	166	151	23	15	84	118	373
8485309	82TEX	3.6	152	148	20	34	71	69	357
8485357	82TEX	3.8	161	147	22	15	72	91	383
8493931	82TEX	3.7	173	145	22	15	95	123	387

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX nonwoven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our nonwoven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

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Bill Of Lading # 80109618

Roll #	ASTM D-4632 GRAB TENSILE (LBS) W X F	ASTM D-4632 GRAB ELONGATION (%) W X F	ASTM D-3786 MULLEN BURST PSI	ASTM D-4533 TRAP TEAR (LBS) W X F	ASTM D-5261 MASS/UNIT AREA OZ/SQ YD	LOT #
<b>Product : 82TEX</b>						
8414136	165 X 166	21 X 16	363	70 X 82	3.72	10172816
8423930	151 X 145	19 X 16	343	67 X 75	3.45	10142215
8424582	148 X 142	19 X 17	332	58 X 63	3.5	10142810
8437746	154 X 157	20 X 17	347	59 X 74	3.43	10144095
8437793	164 X 154	21 X 15	367	73 X 84	3.93	10144364
8437794	166 X 146	21 X 15	350	73 X 64	3.42	10144364
8443243	157 X 147	22 X 17	383	60 X 76	3.6	10144670
8443539	172 X 140	22 X 15	338	76 X 78	3.48	10144668
8443540	163 X 165	22 X 16	357	69 X 81	3.63	10144668
8444236	177 X 158	24 X 18	337	83 X 85	3.63	10144669
8444237	169 X 155	25 X 23	360	75 X 83	3.58	10144669
8445144	161 X 143	21 X 17	353	70 X 67	3.47	10144094
8445145	169 X 150	22 X 24	372	67 X 74	3.52	10144094
8445798	163 X 141	23 X 18	352	70 X 76	3.58	10144671
8447089	158 X 162	21 X 16	355	69 X 76	3.67	10144731
8447090	161 X 136	21 X 16	353	65 X 69	3.59	10144731
8448161	176 X 157	23 X 15	363	74 X 77	3.58	10144363
8449037	167 X 130	24 X 16	333	79 X 71	3.57	10144734
9038	166 X 147	21 X 16	327	70 X 77	3.58	10144734
8449110	175 X 170	23 X 16	367	74 X 84	3.71	10144733
8449111	172 X 144	23 X 18	360	72 X 71	3.51	10144733
8449115	163 X 146	22 X 15	372	76 X 73	3.6	10144733
8449495	168 X 169	22 X 15	367	72 X 86	3.55	10144732
8449907	151 X 136	21 X 15	345	70 X 64	3.43	10144093
8458331	165 X 162	20 X 15	363	73 X 79	3.56	10146136
8470665	159 X 139	20 X 15	355	66 X 72	3.69	10146138
8477401	169 X 157	22 X 17	385	73 X 70	3.81	10147273
8482252	172 X 149	21 X 15	387	72 X 68	3.64	10146139



## Geosynthetic Products Division

12/29/2000

American Colloid-Fairmount, GA  
Alisa Findley  
P.O. Box 88  
Fairmont GA 30139  
BOL 80083607 PO 0/0CW/29984  
Ref:

This is to certify that Product 82TEX, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd <sup>2</sup> - (g/m <sup>2</sup> )	3.20	(108.48)
Thickness	ASTM D-5199 mils - (mm)	16	(0.4064)
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	135 X 135	(600.75 X (600.75))
Elongation	ASTM D-4632 %	15 X 15	
Trapezoidal Tear	ASTM D-4533 lb - (N)	45 X 45	(200.25 X (200.25))
Mullen Burst	ASTM D-3786 psi - (Kpa)	265	(1826.9)
Puncture Strength	ASTM D-4833 lb - (N)	70	(311.5)
AOS	ASTM D-4751 US Sieve - (mm)	40	(1.5748)
Permittivity	ASTM D-4491 SEC-1	0.08	
Permeability -	ASTM D-4491 cm - (sec)	0.004	
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m <sup>2</sup> )	6	(244.46)
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

Patti Weaver  
Technical Manager  
Geosynthetics Products Division

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**Synthetic Industries, Inc.**

4019 Industry Drive • Chattanooga, Tennessee • 37416 • USA  
Telephone • 423-899-0444 • Fax • 423-899-7619 • 1-800-621-0444

Bill Of Lading # 80083607

Roll #	ASTM D-4632 GRAB TENSILE (LBS) W X F	ASTM D-4632 GRAB ELONGATION (%) W x F	ASTM D-3786 MULLEN BURST PSI	ASTM D-4533 TRAP TEAR (LBS) W X F	ASTM D-4833 PUNCTURE STRENGTH LBS	ASTM D-5261 MASS/UNIT AREA OZ/SQ YARD
<b>Product : 82TEX</b>						
8392815	166 x 163	22 x 16	370	71 x 85	94	3.73
8395036	172 x 135	21 x 18	357	71 x 79	92.5	3.33
8400322	169 x 140	24 x 17	370	77 x 80	92	3.43
8400323	175 x 161	23 x 18	367	66 x 77	102.5	3.62
8403229	164 x 156	21 x 16	343	65 x 78	101.5	3.66
8403722	164 x 140	25 x 15	370	73 x 80	89.75	3.62
8405091	155 x 140	20 x 18	335	69 x 68	96.5	3.46
8405092	160 x 138	22 x 18	357	69 x 73	101.5	3.47
8407005	145 x 166	18 x 15	360	67 x 80	93	3.66
8409064	164 x 153	22 x 15	380	72 x 82	95.75	3.74
8409066	160 x 149	21 x 15	355	71 x 77	94.25	3.72
8411155	170 x 151	23 x 16	358	71 x 71	98.25	3.77
8411156	167 x 147	24 x 24	367	63 x 78	94.5	3.58
8411158	163 x 137	22 x 15	340	85 x 55	92.25	3.6
8411680	163 x 141	22 x 18	357	69 x 85	98.75	3.48
8412041	174 x 153	23 x 25	353	70 x 82	94	3.78
8412044	171 x 138	22 x 17	353	75 x 77	93	3.47
8412049	171 x 163	22 x 16	365	71 x 88	96.75	3.71
8412743	154 x 143	20 x 15	360	63 x 69	96.75	3.62
8412744	159 x 143	22 x 15	370	68 x 73	95.25	3.6
8412746	161 x 160	22 x 15	380	70 x 74	96	3.84
8412747	156 x 142	21 x 15	363	73 x 77	105.25	3.73
8414049	162 x 141	21 x 16	348	66 x 72	90.25	3.54
8414050	160 x 146	21 x 15	363	71 x 82	93	3.53
8414131	141 x 136	19 x 18	357	60 x 64	97.25	3.41
8414133	163 x 138	22 x 15	360	71 x 79	99.75	3.63
8416087	167 x 164	21 x 15	373	72 x 85	102.25	3.65
8416089	163 x 157	21 x 16	373	75 x 85	95.25	3.76
8421023	149 x 156	19 x 16	330	57 x 75	93.25	3.69
8421157	168 x 160	21 x 16	372	74 x 83	96.25	3.88
8421405	160 x 151	21 x 16	370	67 x 77	106	3.57



American Colloid-Fairmount, GA  
Alisa Findley  
P.O. Box 88  
Fairmont GA 30139  
BOL 80109618 PO 0-OCW-31354  
Ref:

6/22/2001

This is to certify that Product 82TEX, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	3.20	(108.48)
Thickness	ASTM D-5199 mils - (m)	16	(0.4064)
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	135 X 135	(600.75 X (600.75))
Elongation	ASTM D-4632 %	15 X 15	
Trapezoidal Tear	ASTM D-4533 lb - (N)	45 X 45	(200.25 X (200.25))
Mullen Burst	ASTM D-3786 psi - (Kpa)	265	(1826.9)
Puncture Strength	ASTM D-4833 lb - (N)	70	(311.5)
AOS	ASTM D-4751 US Sieve - (mm)	40	0.425
Permittivit	ASTM D-4491 SEC-1	0.08	
Permeability -	ASTM D-4491 cm - (sec)	0.004	
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)	6	(244.46)
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

Frank P. Pace, P.E.  
Manager - Engineering Services  
SI Geosolutions

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6/22/2001

## Synthetic Industries

Pa

Individual Roll Data  
Bill of Lading 80109618

Roll #	Style	Weight	Tensile		Elongation		T.Tear		Burst
		Osy	W	F	W	F	W	F	
		D5261	lbs	lbs	%	%	lbs	lbs	
			D4632	D4632	D4632	D4632	D4533	D4533	
									psi
									D3786
8484798	82TEX	3.6	166	151	23	15	84	118	373
8485309	82TEX	3.6	152	148	20	34	71	69	357
8485357	82TEX	3.8	161	147	22	15	72	91	383
8493931	82TEX	3.7	173	145	22	15	95	123	387

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8/15/2001

American Colloid-Fairmount, GA  
Kelly Miller

P.O. Box 88

Fairmont GA 30139

BOL 80112861 PO

Ref:

This is to certify that Product GEOTEX 650, a nonwoven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level. This geotextile has been continuously inspected for the presence of needles and none were detected.

<u>Physical Property</u>	<u>Test Method</u>	<u>US Units</u>		<u>SI Unit</u>	
Mass Per Unit Area	ASTM D-5261	6.0	oz/yd <sup>2</sup>	(203.4)	g/m <sup>2</sup>
Thickness	ASTM D-5199	120	mils	(3.048)	mm
Tensile Strength	ASTM D-4632	45	lbs	(200.25)	N
Elongation	ASTM D-4632	90	%	90	%
Trapezoidal Tear	ASTM D-4533	25	lbs	(111.25)	N
Mullen Burst	ASTM D-3786	190	psi	(1309.8)	kPa
Puncture Strength	ASTM D-4833	50	lbs	(222.5)	N
A.O.S.	ASTM D-4751		Sieve		mm
Permittivity	ASTM D-4491		sec-1		sec-1
Permeability	ASTM D-4491		cm/sec		cm/sec
Water Flow Rate	ASTM D-4491		gpm/ft <sup>2</sup>		lpm/m <sup>2</sup>
UV Resistance	ASTM D-4355		%	( )	%

Strength Retained after 500 hours exposure in Xenon Arc Weatherometer

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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1/23/2001

**Individual Roll Data**  
**Bill of Lading 80112861**

Roll #	Style	Batch	Weight	Thick	Tensile		Elongation		T.Tear		Burst	Punct
					MD	XMD	MD	XMD	MD	XMD		
			Osy	mils	lbs	lbs	%	%	lbs	lbs	psi	lbs
			D5261	D5199	D4632	D4632	D4632	D4632	D4533	D4533	D3786	D4633
B873470A	650	80483	6.2	157	72	73	112	116	29	16	230	53
B873490A	650	80483	8.3	173	99	178	139	111	57	66	313	96
B873543A	650	80483	6.9	153	66	117	153	127	32	46	229	50

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX nonwoven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our nonwoven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

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8/16/2001

American Colloid-Fairmount, GA

Kelly Miller

P.O. Box 88

Fairmont GA 30139

BOL 80117950 PO

Ref:

This is to certify that Product GEOTEX 650, a nonwoven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level. This geotextile has been continuously inspected for the presence of needles and none were detected.

<u>Physical Property</u>	<u>Test Method</u>	<u>US Units</u>		<u>SI Unit</u>	
Mass Per Unit Area	ASTM D-5261	6.0	oz/yd <sup>2</sup>	(203.4)	g/m <sup>2</sup>
Thickness	ASTM D-5199	120	mils	(3.048)	mm
Tensile Strength	ASTM D-4632	45	lbs	(200.25)	N
Elongation	ASTM D-4632	90	%	90	%
Trapezoidal Tear	ASTM D-4533	25	lbs	(111.25)	N
Mullen Burst	ASTM D-3786	190	psi	(1309.8)	kPa
Puncture Strength	ASTM D-4833	50	lbs	(222.5)	N
A.O.S.	ASTM D-4751		Sieve		mm
Permittivity	ASTM D-4491		sec-1		sec-1
Permeability	ASTM D-4491		cm/sec		cm/sec
Water Flow Rate	ASTM D-4491		gpm/ft <sup>2</sup>	( )	lpm/m <sup>2</sup>
UV Resistance	ASTM D-4355		%		%

Strength Retained after 500 hours exposure in Xenon Arc Weatherometer

Sincerely

John D. Cannon, P.E.

Regional Engineer

SI Geosolutions

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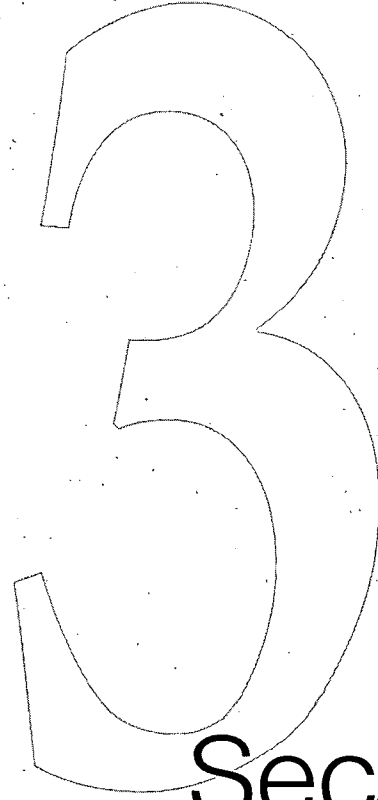
1/23/2001

**Individual Roll Data**  
**Bill of Lading 80117950**

Roll #	Style	Batch	Weight	Thick	Tensile		Elongation		T.Tear		Burst	Punct
					MD	XMD	MD	XMD	MD	XMD		
			Osy	mils	lbs	lbs	%	%	lbs	lbs	psi	lbs
			D5261	D5199	D4632	D4632	D4632	D4632	D4533	D4533	D3786	D4833
A529704A	650	51583	7	134	94	156	124	112	41	54	259	79
A529720A	650	51583	6.5	133	72	118	122	99	28	49	217	70

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX nonwoven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our nonwoven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of nonwoven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped and rolls listed may or may not be the actual rolls tested. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



# Section Three

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.

2306 Gravel Drive

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

6 print(s) each of the following Submittal: D-02275-015-A (QA/QC Roll Certificates: Claymax 200R  
(Set 1 of 4) (143 rolls))

which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

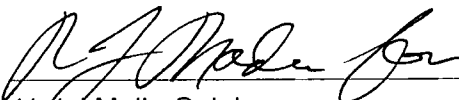
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By

  
Abdul Mulla-Saleh

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527


Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-19-01Submittal Identifier: D-02275-015-A

Original Submittal

☐ SupplementSubmitted: November 19, 2001No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: QA/QC Roll Certificates: Claymax 200R (Set 1 of 4) (143 rolls)Specification Identifier: 01300, 02275 Section 1.03A.1 (e)Manufacturer: CETCO Lining Technologies, Inc.Installer: COMANCO Environmental Corporation**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
ENGINEER'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved <input type="checkbox"/> Rejected <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequence or procedures of construction and performing his work in a safe manner. CAMP DRESSER &amp; MCKEE INC.</p>	
By <u>AMS</u>	Date <u>12/3/01</u>



# GEOSYNTHETIC CLAY LINER

## MANUFACTURING

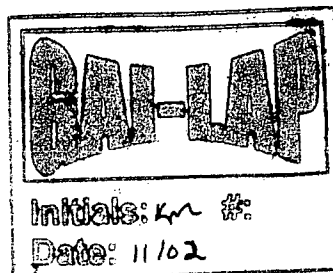
## QA/QC DATA PACKAGE

PROJECT NAME: GSE/Pasco County LF.

PREPARED FOR: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

PREPARED BY: Kelly Miller  
CETCO  
234 Gordon St. S.E.  
Fairmount, GA 30139

TELEPHONE: (706) 337-5316  
FAX: (706) 337-2215







# GEOSYNTHETIC CLAY LINER

## DAILY MANUFACTURING QA/QC DATA

FOR ALL GCL MANUFACTURED ON:

GSE/PASCO COUNTY LF.  
SPRING HILL, FL  
PURCHASE ORDER # 3256-000-OD  
CETCO ORDER(S) #148671-148679

### CONTENTS:

1. DAILY GCL PRODUCTION CERTIFICATION
2. GCL MANUFACTURING CERTIFICATON AND TEST RESULTS
3. GCL MQA TRACKING FORM





# **DAILY GEOSYNTHETIC CLAY LINER PRODUCTION CERTIFICATION**





## GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

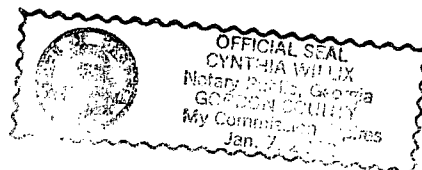
CETCO JOB:	GSE/PASCO COUNTY LF.
DATE:	NOVEMBER 2, 2001
ORDER#(S):	148671-148679
PRODUCT:	CLAYMAX200R

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the Geosynthetic Clay Liner (GCL) manufactured in this lot achieves the physical and chemical criteria listed on the attached sheets.

Kelly Miller  
Quality Analysis Coordinator  
CETCO-Colloid Environmental Technologies CO

Subscribed and sworn to before me this 2 day of Nov., 2001.

Notary Public





# CLAYMAX 200R MANUFACTURING CERTIFICATION

TO: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

ORDER # 148671-148679

CETCO hereby affirms and certifies that Claymax 200R material supplied to this project will meet the physical and chemical criteria listed below:

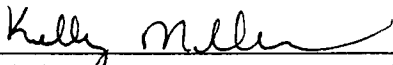
PROPERTY	TEST METHOD	REQUIRED VALUE
<i>Bentonite</i>		
Free Swell	ASTM D 5890	24 min.
Fluid Loss	ASTM D 5891	18 max.
<i>Finished Product</i>		
Bentonite Mass/Area	ASTM D 5993	0.75 lb/sq. ft. min.
Grab Strength	ASTM D 4632	90 lbs. MARV
Index Flux	ASTM D 5887	$1 \times 10^{-8}$ m <sup>3</sup> /m <sup>2</sup> /sec (max.)
Permeability	ASTM D 5084	max. $5 \times 10^{-9}$ cm/sec

\* Reported at 0% moisture content.

GAI Lab Accredited Test Methods were followed during conformance testing for :

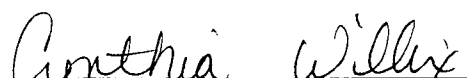
ASTM D 5993 - Bentonite Mass/Area

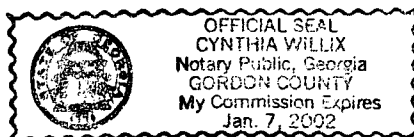
ASTM D 4632 - Grab Strength and Grab Elongation



CETCO-Colloid Environmental Technologies Co.

Subscribed and sworn to before me this 2 day of Nov, 20 01

  
Notary Public

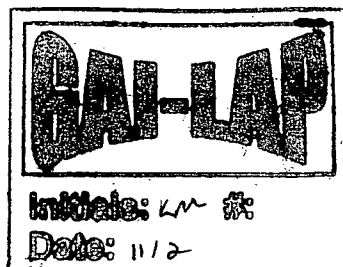




# **GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS**



QCG#FT2 QCT#FT2  
11/02/01 9:27:43



CETCO

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148671

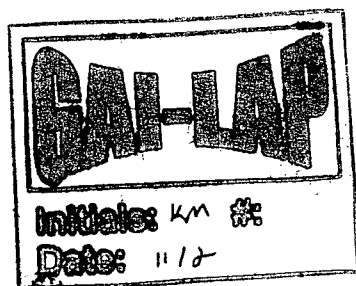
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb max ASTM D 4632
FA-CLAYMAX200R	200141FA	00001268	.89	194.20
FA-CLAYMAX200R	200141FA	00001224	.82	190.10
FA-CLAYMAX200R	200141FA	00001185	.81	190.10
FA-CLAYMAX200R	200141FA	00001182	.81	190.10
FA-CLAYMAX200R	200141FA	00001170	.86	198.60
FA-CLAYMAX200R	200141FA	00001169	.86	198.60
FA-CLAYMAX200R	200140FA	00001112	.79	214.90
FA-CLAYMAX200R	200140FA	00001094	.78	214.90
FA-CLAYMAX200R	200140FA	00001090	.78	214.90
FA-CLAYMAX200R	200140FA	00001083	.78	214.90
FA-CLAYMAX200R	200140FA	00001079	.78*	214.90*
FA-CLAYMAX200R	200140FA	00001069	.91	224.00
FA-CLAYMAX200R	200132FA	00001033	.90	200.30
FA-CLAYMAX200R	200132FA	00000970	.91*	191.00
FA-CLAYMAX200R	200132FA	00000928	.96	221.90

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#F72 QCT#F72  
11/02/01 9:31:05



FAIRMOUNT CETCO

CETCO

PAGE: 1

GCL QUALITY DATA

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER # 000148672

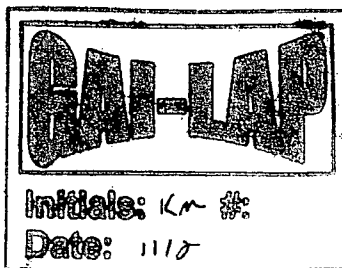
MATERIAL	LOT #	ROLL NO	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	STRENGTH 75 lb merv ASTM D 4632
FA-CLAYMAX200R	200144FA	00001666	.80	182.80
FA-CLAYMAX200R	200141FA	00001258	.77	190.10
FA-CLAYMAX200R	200141FA	00001207	.80	190.10
FA-CLAYMAX200R	200141FA	00001204	.80	190.10
FA-CLAYMAX200R	200141FA	00001203	.80	190.10
FA-CLAYMAX200R	200141FA	00001200	.80	190.10
FA-CLAYMAX200R	200141FA	00001180	.81	190.10
FA-CLAYMAX200R	200141FA	00001178	.81	190.10
FA-CLAYMAX200R	200141FA	00001175	.81	190.10
FA-CLAYMAX200R	200140FA	00001160	.86	198.60
FA-CLAYMAX200R	200140FA	00001151	.84	198.60
FA-CLAYMAX200R	200140FA	00001123	.79	214.90
FA-CLAYMAX200R	200140FA	00001078	.91	224.00
FA-CLAYMAX200R	200140FA	00001063	.79	224.00
FA-CLAYMAX200R	200140FA	00001060	.79	224.00
FA-CLAYMAX200R	200129FA	00000843	1.00	197.50

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:29:56



CETCO

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148673

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GPAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001594	.80	182.80
FA-CLAYMAX200R	200142FA	00001593	.80	182.80
FA-CLAYMAX200R	200142FA	00001592	.80	182.80
FA-CLAYMAX200R	200142FA	00001588	.84	182.80
FA-CLAYMAX200R	200142FA	00001587	.84	182.80
FA-CLAYMAX200R	200142FA	00001586	.84	182.80
FA-CLAYMAX200R	200142FA	00001585	.84	182.80
FA-CLAYMAX200R	200142FA	00001584	.84	182.80
FA-CLAYMAX200R	200142FA	00001579	.84	182.80
FA-CLAYMAX200R	200142FA	00001578	.84	182.80
FA-CLAYMAX200R	200142FA	00001577	.84	182.80
FA-CLAYMAX200R	200142FA	00001576	.84	182.80
FA-CLAYMAX200R	200142FA	00001574	.84*	182.80*
FA-CLAYMAX200R	200142FA	00001567	.81	207.80
FA-CLAYMAX200R	200142FA	00001566	.81	207.80
FA-CLAYMAX200R	200142FA	00001557	.81	207.80

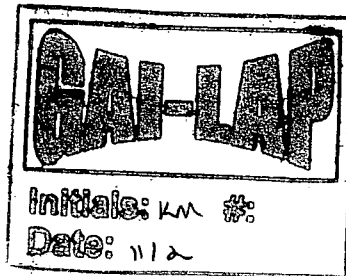
NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*



QCG#FT2 QCT#FT2  
11/02/01 9:29:04



CETCO

GCL QUALITY DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148674

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA: .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001596	.80	182.80
FA-CLAYMAX200R	200142FA	00001590	.84	182.80
FA-CLAYMAX200R	200142FA	00001583	.84	182.80
FA-CLAYMAX200R	200142FA	00001582	.84	182.80
FA-CLAYMAX200R	200142FA	00001575	.84	182.80
FA-CLAYMAX200R	200142FA	00001573	.81	207.80
FA-CLAYMAX200R	200142FA	00001572	.81	207.80
FA-CLAYMAX200R	200142FA	00001555	.88	207.80
FA-CLAYMAX200R	200142FA	00001554	.88	207.80
FA-CLAYMAX200R	200142FA	00001550	.88	207.80
FA-CLAYMAX200R	200142FA	00001548	.88	207.80
FA-CLAYMAX200R	200142FA	00001547	.88	207.80
FA-CLAYMAX200R	200142FA	00001546	.88	207.80
FA-CLAYMAX200R	200142FA	00001539	.88*	207.80
FA-CLAYMAX200R	200142FA	00001538	.83	207.80
FA-CLAYMAX200R	200142FA	00001537	.83	207.80

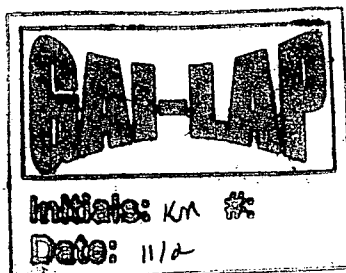
NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:28:07

FAIRMOUNT CETCO



CETCO

GCL QUALITY DATA

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148675

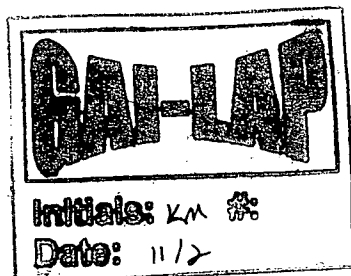
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001376	.63	204.60
FA-CLAYMAX200R	200142FA	00001368	.61	204.60
FA-CLAYMAX200R	200142FA	00001367	.61	204.60
FA-CLAYMAX200R	200142FA	00001363	.61	204.60
FA-CLAYMAX200R	200142FA	00001359	.61	204.60
FA-CLAYMAX200R	200142FA	00001358	.61	204.60
FA-CLAYMAX200R	200142FA	00001357	.61	204.60
FA-CLAYMAX200R	200142FA	00001356	.61	204.60
FA-CLAYMAX200R	200142FA	00001349	.63	204.60
FA-CLAYMAX200R	200142FA	00001348	.63	204.60
FA-CLAYMAX200R	200142FA	00001346	.63	204.60
FA-CLAYMAX200R	200142FA	00001332	.62	204.60
FA-CLAYMAX200R	200142FA	00001324	.62	204.60
FA-CLAYMAX200R	200142FA	00001308	.64	204.60
FA-CLAYMAX200R	200142FA	00001302	.64*	204.60
FA-CLAYMAX200R	200142FA	00001300	.65	204.60

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:28:30



CETCO

GCL QUALITY DATA

PAGE: 1

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER # 000148676

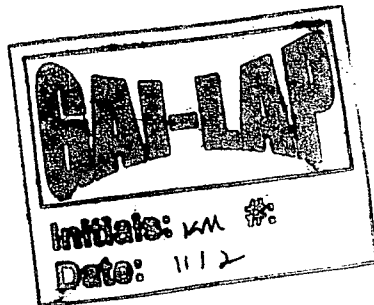
MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb max ASTM D 4632
FA-CLAYMAX200R	200141FA	00001238	.84	190.10
FA-CLAYMAX200R	200140FA	00001150	.84	198.60
FA-CLAYMAX200R	200140FA	00001143	.84*	198.60*
FA-CLAYMAX200R	200140FA	00001129	.86	214.90
FA-CLAYMAX200R	200140FA	00001127	.86*	214.90
FA-CLAYMAX200R	200140FA	00001124	.79	214.90
FA-CLAYMAX200R	200140FA	00001120	.79	214.90
FA-CLAYMAX200R	200140FA	00001113	.79	214.90
FA-CLAYMAX200R	200140FA	00001108	.79	214.90
FA-CLAYMAX200R	200140FA	00001101	.79	214.90
FA-CLAYMAX200R	200140FA	00001100	.79	214.90
FA-CLAYMAX200R	200140FA	00001099	.79	214.90
FA-CLAYMAX200R	200140FA	00001097	.79	214.90
FA-CLAYMAX200R	200140FA	00001096	.79	214.90
FA-CLAYMAX200R	200140FA	00001061	.79	224.00
FA-CLAYMAX200R	200129FA	00000865	1.00	197.50

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:31:46



CETCO

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000146677

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA: .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200141FA	00001266	.89	194.20
FA-CLAYMAX200R	200141FA	00001265	.89	194.20
FA-CLAYMAX200R	200141FA	00001259	.77	190.10
FA-CLAYMAX200R	200141FA	00001253	.77	190.10
FA-CLAYMAX200R	200141FA	00001217	.82	190.10
FA-CLAYMAX200R	200141FA	00001214	.82	190.10
FA-CLAYMAX200R	200141FA	00001212	.82	190.10
FA-CLAYMAX200R	200141FA	00001210	.82	190.10
FA-CLAYMAX200R	200141FA	00001206	.80	190.10
FA-CLAYMAX200R	200141FA	00001205	.80	190.10
FA-CLAYMAX200R	200141FA	00001202	.80	190.10
FA-CLAYMAX200R	200141FA	00001199	.80	190.10
FA-CLAYMAX200R	200141FA	00001184	.81	190.10
FA-CLAYMAX200R	200141FA	00001181	.81	190.10
FA-CLAYMAX200R	200141FA	00001179	.81	190.10
FA-CLAYMAX200R	200129FA	00000844	1.00	197.50

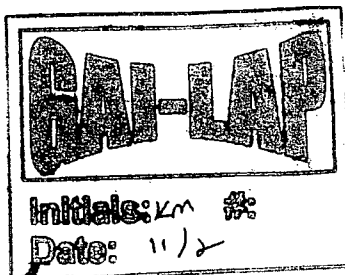
NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:30:38

FAIRMOUNT CETCO



CETCO

GCL QUALITY DATA

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER # 000146678

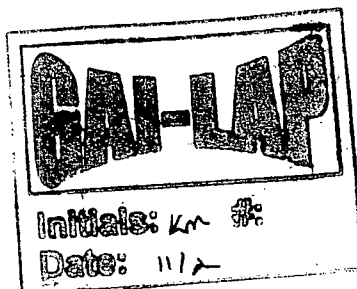
ITEM#	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001595	.80	182.80
FA-CLAYMAX200R	200142FA	00001395	.79	207.80
FA-CLAYMAX200R	200142FA	00001347	.83	204.60
FA-CLAYMAX200R	200142FA	00001325	.82	204.60
FA-CLAYMAX200R	200142FA	00001323	.82	204.60
FA-CLAYMAX200R	200142FA	00001317	.84	204.60
FA-CLAYMAX200R	200142FA	00001309	.84	204.60
FA-CLAYMAX200R	200141FA	00001267	.89	194.20
FA-CLAYMAX200R	200141FA	00001257	.77	190.10
FA-CLAYMAX200R	200141FA	00001201	.80	190.10
FA-CLAYMAX200R	200141FA	00001172	.86	196.60
FA-CLAYMAX200R	200140FA	00001155	.84	196.60
FA-CLAYMAX200R	200140FA	00001103	.79	214.90
FA-CLAYMAX200R	200132FA	00001030	.90	200.30
FA-CLAYMAX200R	200129FA	00000857	1.00	197.50
FA-CLAYMAX200R	200129FA	00000848	1.00	197.50

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/02/01 9:27:19



CETC0

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETC0

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER # 000148679

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001580	.84	182.80
FA-CLAYMAX200R	200142FA	00001568	.81	207.80
FA-CLAYMAX200R	200142FA	00001552	.88	207.80
FA-CLAYMAX200R	200142FA	00001551	.88	207.80
FA-CLAYMAX200R	200142FA	00001549	.88	207.80
FA-CLAYMAX200R	200142FA	00001544	.88	207.80
FA-CLAYMAX200R	200142FA	00001542	.88	207.80
FA-CLAYMAX200R	200142FA	00001541	.88	207.80
FA-CLAYMAX200R	200142FA	00001540	.88	207.80
FA-CLAYMAX200R	200142FA	00001536	.83	207.80
FA-CLAYMAX200R	200142FA	00001535	.83	207.80
FA-CLAYMAX200R	200142FA	00001534	.83	207.80
FA-CLAYMAX200R	200142FA	00001532	.83	207.80
FA-CLAYMAX200R	200142FA	00001531	.83	207.80
FA-CLAYMAX200R	200142FA	00001530	.83	207.80
FA-CLAYMAX200R	200142FA	00001522	.83*	207.80

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*



# **GEOSYNTHETIC CLAY LINER MQA TRACKING FORMS**



QCG#TF1 QCT#TF1  
11/02/01 9:27:43

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148671  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200132FA									
00000928	FA-CLAYMAX200R	150	2175	3350	8550749		8533106		453204
00000970	FA-CLAYMAX200R	150	2175	3300	8534995		8550754		422519
00001033	FA-CLAYMAX200R	150	2175	3189	8518318		8535786		422519
LOT# 200140FA									
00001069	FA-CLAYMAX200R	150	2175	2932	8673216		8680238		453302
00001079	FA-CLAYMAX200R	150	2175	2750	8673216		8680238		453302
00001083	FA-CLAYMAX200R	150	2175	2752	8673216		8680238		453302
00001090	FA-CLAYMAX200R	150	2175	2719	8673216		8680238		453302
00001094	FA-CLAYMAX200R	150	2175	2976	8663272		8681810		453302
00001112	FA-CLAYMAX200R	150	2175	2865	8663272		8681810		453302
LOT# 200141FA									
00001169	FA-CLAYMAX200R	150	2175	2821	8695431		8688608		455975
00001170	FA-CLAYMAX200R	150	2175	2892	8695431		8688608		455975
00001182	FA-CLAYMAX200R	150	2175	2798	8695431		8688608		455975
00001185	FA-CLAYMAX200R	150	2175	2816	8695431		8688608		455975
00001224	FA-CLAYMAX200R	150	2175	2672	8581417		8681804		455975
00001268	FA-CLAYMAX200R	150	2175	2820	8578517		8563578		420127

TOTAL SQUARE FEET.....

321625



QCG#TF1 QCT#TF1  
11/02/01 9:31:05

CETCO  
GCL M&A/M&C TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148672  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA 00000843	FA-CLAYMAX200R	150	2175	3273	8547096		8563585		421014
LOT# 200140FA 00001060	FA-CLAYMAX200R	150	2175	3294	8673216		8680238		453302
00001063	FA-CLAYMAX200R	150	2175	3250	8673216		8680238		453302
00001078	FA-CLAYMAX200R	150	2175	2914	8673216		8680238		453302
00001123	FA-CLAYMAX200R	150	2175	2918	8663272		8681810		453302
00001151	FA-CLAYMAX200R	150	2175	2793	8663272		8679752		455975
00001160	FA-CLAYMAX200R	150	2175	2832	8663272		8679752		455975
LOT# 200141FA 00001175	FA-CLAYMAX200R	150	2175	2839	8695431		8688608		455975
00001178	FA-CLAYMAX200R	150	2175	2796	8695431		8688608		455975
00001180	FA-CLAYMAX200R	150	2175	2877	8695431		8688608		455975
00001200	FA-CLAYMAX200R	150	2175	2877	8695431		8681804		455975
00001203	FA-CLAYMAX200R	150	2175	2750	8581417		8681804		455975
00001204	FA-CLAYMAX200R	150	2175	2779	8581417		8681804		455975
00001207	FA-CLAYMAX200R	150	2175	2692	8581417		8681804		455975
00001258	FA-CLAYMAX200R	150	2175	2892	8578517		8563578		420127
LOT# 200144FA 00001666	FA-CLAYMAX200R	150	2175	2879	8634508		8610697		423457

TOTAL SQUARE FEET.....

34,800

QCG#TF1 QCT#TF1  
11/02/01 9:29:56

CETCO  
GCL M&A/M&C TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148673  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200142FA									
00001557	FA-CLAYMAX200R	150	2175	2890	8533105		8501425		453791
00001566	FA-CLAYMAX200R	150	2175	2986	8533105		8501425		453791
00001567	FA-CLAYMAX200R	150	2175	2993	8533105		8501425		453791
00001574	FA-CLAYMAX200R	150	2175	3117	8680236		8566827		453791
00001576	FA-CLAYMAX200R	150	2175	2993	8680236		8566827		453791
00001577	FA-CLAYMAX200R	150	2175	3026	8680236		8566827		453791
00001578	FA-CLAYMAX200R	150	2175	3003	8680236		8566827		420719
00001579	FA-CLAYMAX200R	150	2175	2998	8680236		8566827		420719
00001584	FA-CLAYMAX200R	150	2175	2989	8680236		8566827		420719
00001585	FA-CLAYMAX200R	150	2175	2993	8680236		8566827		420719
00001586	FA-CLAYMAX200R	150	2175	3001	8680236		8566827		420719
00001587	FA-CLAYMAX200R	150	2175	2920	8680236		8566827		420719
00001588	FA-CLAYMAX200R	150	2175	2922	8680236		8566827		420719
00001592	FA-CLAYMAX200R	150	2175	2928	8680236		8566827		420719
00001593	FA-CLAYMAX200R	150	2175	2918	8680236		8566827		420719
00001594	FA-CLAYMAX200R	150	2175	2926	8680236		8566827		420719

TOTAL SQUARE FEET.....

34.800

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/02/01 9:29:03

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148674  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200142FA									
00001537	FA-CLAYMAX200R	150	2175	2936	8533105		8629800		453791
00001538	FA-CLAYMAX200R	150	2175	2886	8533105		8629800		453791
00001539	FA-CLAYMAX200R	150	2175	2904	8533105		8629800		453791
00001546	FA-CLAYMAX200R	150	2175	2842	8533105		8629800		453791
00001547	FA-CLAYMAX200R	150	2175	2869	8533105		8629800		453791
00001548	FA-CLAYMAX200R	150	2175	2858	8533105		8629800		453791
00001550	FA-CLAYMAX200R	150	2175	2962	8516137		8629800		453791
00001554	FA-CLAYMAX200R	150	2175	2874	8533105		8629800		453791
00001555	FA-CLAYMAX200R	150	2175	2879	8533105		8501425		453791
00001572	FA-CLAYMAX200R	150	2175	3012	8680236		8566827		453791
00001573	FA-CLAYMAX200R	150	2175	2972	8680236		8566827		453791
00001575	FA-CLAYMAX200R	150	2175	2989	8680236		8566827		453791
00001582	FA-CLAYMAX200R	150	2175	2972	8680236		8566827		420719
00001583	FA-CLAYMAX200R	150	2175	2973	8680236		8566827		420719
00001590	FA-CLAYMAX200R	150	2175	2918	8680236		8566827		420719
00001596	FA-CLAYMAX200R	150	2175	2906	8680236		8566827		420719

TOTAL SQUARE FEET.....

34,800

QCG#TF1 QCT#TF1  
11/02/01 9:28:07

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148675  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200142FA									
00001300	FA-CLAYMAX200R	150	2175	2786	8595180		8592719		420127
00001302	FA-CLAYMAX200R	150	2175	2743	8595180		8592719		420127
00001308	FA-CLAYMAX200R	150	2175	2848	8595174		8592719		420127
00001324	FA-CLAYMAX200R	150	2175	2810	8595174		8638757		422542
00001332	FA-CLAYMAX200R	150	2175	2869	8595174		8638757		422542
00001346	FA-CLAYMAX200R	150	2175	2912	8566826		8638757		422542
00001348	FA-CLAYMAX200R	150	2175	2903	8566826		8610890		422542
00001349	FA-CLAYMAX200R	150	2175	2908	8566826		8610890		422542
00001356	FA-CLAYMAX200R	150	2175	2982	8566826		8610890		422542
00001357	FA-CLAYMAX200R	150	2175	2902	8566826		8610890		422542
00001358	FA-CLAYMAX200R	150	2175	2891	8566826		8610890		422542
00001359	FA-CLAYMAX200R	150	2175	2895	8566826		8610890		422542
00001363	FA-CLAYMAX200R	150	2175	3000	8566826		8610890		422542
00001367	FA-CLAYMAX200R	150	2175	2911	8566826		8610890		422542
00001368	FA-CLAYMAX200R	150	2175	2893	8566826		8610890		422542
00001376	FA-CLAYMAX200R	150	2175	2900	8566826		8610890		422542

TOTAL SQUARE FEET.....

34,800

QCG#TFL QCT#TFL  
11/02/01 9:28:30

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148676  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA 00000865	FA-CLAYMAX200R	150	2175	3218	8534998		8519352		421014
LOT# 200140FA 00001061	FA-CLAYMAX200R	150	2175	3374	8673216		8680238		453302
00001096	FA-CLAYMAX200R	150	2175	2823	8663272		8681810		453302
00001097	FA-CLAYMAX200R	150	2175	2817	8663272		8681810		453302
00001099	FA-CLAYMAX200R	150	2175	2783	8663272		8681810		453302
00001100	FA-CLAYMAX200R	150	2175	2757	8663272		8681810		453302
00001101	FA-CLAYMAX200R	150	2175	2763	8663272		8681810		453302
00001108	FA-CLAYMAX200R	150	2175	2841	8663272		8681810		453302
00001113	FA-CLAYMAX200R	150	2175	2798	8663272		8681810		453302
00001120	FA-CLAYMAX200R	150	2175	2852	8663272		8681810		453302
00001124	FA-CLAYMAX200R	150	2175	2908	8663272		8681810		453302
00001127	FA-CLAYMAX200R	150	2175	2879	8663272		8679752		453302
00001129	FA-CLAYMAX200R	150	2175	2892	8663272		8679752		453302
00001143	FA-CLAYMAX200R	150	2175	2824	8663272		8679752		455975
00001150	FA-CLAYMAX200R	150	2175	2749	8663272		8679752		455975
LOT# 200141FA 00001238	FA-CLAYMAX200R	150	2175	2736	8578517		8563578		420127

TOTAL SQUARE FEET.....

34,800

QCG#TF1 QCT#TF1  
11/02/01 9:31:46

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148677  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA 00000844	FA-CLAYMAX200R	150	2175	3274	8547096		8563585		421014
LOT# 200141FA 00001179	FA-CLAYMAX200R	150	2175	2928	8695431		8688608		455975
00001181	FA-CLAYMAX200R	150	2175	2852	8695431		8688608		455975
00001184	FA-CLAYMAX200R	150	2175	2936	8695431		8688608		455975
00001199	FA-CLAYMAX200R	150	2175	2892	8695431		8688608		455975
00001202	FA-CLAYMAX200R	150	2175	2753	8581417		8681804		455975
00001205	FA-CLAYMAX200R	150	2175	2752	8581417		8681804		455975
00001206	FA-CLAYMAX200R	150	2175	2750	8581417		8681804		455975
00001210	FA-CLAYMAX200R	150	2175	2683	8581417		8681804		455975
00001212	FA-CLAYMAX200R	150	2175	2686	8581417		8681804		455975
00001214	FA-CLAYMAX200R	150	2175	2776	8581417		8681804		455975
00001217	FA-CLAYMAX200R	150	2175	2678	8581417		8681804		455975
00001253	FA-CLAYMAX200R	150	2175	2785	8578517		8563578		420127
00001259	FA-CLAYMAX200R	150	2175	2853	8578517		8563578		420127
00001265	FA-CLAYMAX200R	150	2175	2842	8578517		8563578		420127
00001266	FA-CLAYMAX200R	150	2175	2890	8578517		8563578		420127

TOTAL SQUARE FEET.....

34,800

QCG#TFL 11/02/01  
QCT#TFL 9:30:38

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148678  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA									
00000848	FA-CLAYMAX200R	150	2175	3258	8534998		8563585		421014
00000857	FA-CLAYMAX200R	150	2175	3258	8534998		8519352		421014
LOT# 200132FA									
00001030	FA-CLAYMAX200R	150	2175	3220	8518318		8535786		422519
LOT# 200140FA									
00001103	FA-CLAYMAX200R	150	2175	2784	8663272		8681810		453302
00001155	FA-CLAYMAX200R	150	2175	2813	8663272		8679752		455975
LOT# 200141FA									
00001172	FA-CLAYMAX200R	150	2175	2862	8695431		8688608		455975
00001201	FA-CLAYMAX200R	150	2175	2763	8581417		8681804		455975
00001257	FA-CLAYMAX200R	150	2175	2792	8578517		8563578		420127
00001267	FA-CLAYMAX200R	150	2175	2878	8578517		8563578		420127
LOT# 200142FA									
00001309	FA-CLAYMAX200R	150	2175	2855	8595174		8638757		420127
00001317	FA-CLAYMAX200R	150	2175	2811	8595174		8638757		422542
00001323	FA-CLAYMAX200R	150	2175	2812	8595174		8638757		422542
00001325	FA-CLAYMAX200R	150	2175	2813	8595174		8638757		422542
00001347	FA-CLAYMAX200R	150	2175	2999	8566826		8610890		422542
00001395	FA-CLAYMAX200R	150	2175	3046	8680242		8579960		422542
00001595	FA-CLAYMAX200R	150	2175	2921	8680236		8566827		420719

TOTAL SQUARE FEET.....

34,800

QCT#TF1 11/02/01  
QCT#TF1 9:27:19

CETCO  
GCL M&A/M&C TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148679  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200142FA									
00001522	FA-CLAYMAX200R	150	2175	2998	8533105		8629800		453791
00001530	FA-CLAYMAX200R	150	2175	2962	8533105		8629800		453791
00001531	FA-CLAYMAX200R	150	2175	2918	8533105		8629800		453791
00001532	FA-CLAYMAX200R	150	2175	2906	8533105		8629800		453791
00001534	FA-CLAYMAX200R	150	2175	2869	8533105		8629800		453791
00001535	FA-CLAYMAX200R	150	2175	3051	8533105		8629800		453791
00001536	FA-CLAYMAX200R	150	2175	2906	8533105		8629800		453791
00001540	FA-CLAYMAX200R	150	2175	2898	8533105		8629800		453791
00001541	FA-CLAYMAX200R	150	2175	2899	8533105		8629800		453791
00001542	FA-CLAYMAX200R	150	2175	2872	8533105		8629800		453791
00001544	FA-CLAYMAX200R	150	2175	2848	8533105		8629800		453791
00001549	FA-CLAYMAX200R	150	2175	2873	8533105		8629800		453791
00001551	FA-CLAYMAX200R	150	2175	2933	8533105		8629800		453791
00001552	FA-CLAYMAX200R	150	2175	2948	8533105		8629800		453791
00001568	FA-CLAYMAX200R	150	2175	2989	8533105		8501425		453791
00001580	FA-CLAYMAX200R	150	2175	3009	8680236		8566827		420719

TOTAL SQUARE FEET.....

34,800





American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80097947 PO  
Ref:

5/24/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80097947		MD	XMD	MD	XMD
8501430	864A	2.93	80.2	40.1	24.0	34.6
8516145	864A	2.93	59.5	41.7	25.0	37.2
8518313	864A	3.20	62.6	43.7	23.3	38.3
8518317	864A	3.19	67.4	41.2	26.0	39.7
8519350	864A	3.02	63.5	40.2	25.6	36.6
8519352	864A	2.86	46.8	38.2	23.7	37.7
8519356	864A	3.03	61.7	35.7	25.1	37.3
8533100	864A	3.00	44.3	42.2	26.0	34.0
8533102	864A	3.05	68.8	84.5	26.6	62.8
8533107	864A	3.05	46.3	39.4	28.9	39.0
8534991	864A	2.99	82.0	89.5	34.6	61.8
8535786	864A	2.91	88.4	37.6	33.6	37.4

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of woven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80128021 PO

10/15/2001

Ref:

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80127262		MD	XMD	MD	XMD
			D4632	D4632	D4632	D4632
8592722	864A	2.75	68.0	35.4	23.7	37.2
8595171	864A	3.00	73.1	41.6	24.9	35.4
8592713	864A	3.04	80.8	48.0	25.3	35.3
8595173	864A	3.00	79.8	40.6	26.2	37.2
8562497	864A	3.03	50.8	39.1	34.8	41.5
8503602	864A	2.95	42.0	45.3	27.6	37.2



American Colloid Celco WY

10/4/2001

Noe Garcia

PO Box 428

Lovell

WY

82431

BOL 80125655 PO OCW-32374

Ref:

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mls - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivity	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.

Regional Engineer

SI Geosolutions

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11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80125655		MD	XMD	MD	XMD
8563583	864A184	2.9	58	43	26	37
8579959	864A184	3.0	55	30	26	39
8581417	864A184	3	83	42	27	36



American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80103182 PO O-OCW-31055  
Ref:

5/11/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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11/1/2000

Roll#	Batch	Weight	Tensile		Elongation	
BOL# 'S	80103182		MD	XMD	MD	XMD
8533102	864A	3.05	68.8	26.6	84.5	62.8
8534994	864A	3.10	77.5	23.1	39.7	35.1
8535786	864A	2.91	88.4	33.6	37.6	37.4
8550748	864A	2.98	79.2	26.4	47.0	36.1
8562497	864A	3.03	50.8	39.1	34.8	41.5

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of woven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.





American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80103162 PO O-OCW-31055  
Ref:

5/11/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mills - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80103162		MD	XMD	MD	XMD
8503602	864A	2.95	42.0	45.3	27.6	37.2
8534991	864A	2.99	82.0	89.5	34.6	61.8
8535782	864A	3.01	63.6	74.9	26.2	49.6
8547496	864A	3.09	68.4	39.4	27.0	40.9
8550751	864A	2.98	31.8	38.9	23.9	39.6
8562497	864A	3.03	50.8	34.8	39.1	41.5
8563583	864A	2.90	58.3	43.0	25.9	37.1
8563585	864A	2.92	44.1	35.7	26.4	38.8

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of woven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80096408 PO

5/24/2001

Ref:

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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11/1/2000

Roll#	Batch	Style	Thick	Weight	Tensile		Elongation		Trap Tear		Burst	Punct
BOL# 'S	80096408				MD	XMD	MD	XMD	MD	XMD		
8501430		864A184		2.93	80.19667	40.1325	23.97333	34.6125				
8516140		864A184		3.07	46.2725	42.31	29.36	36.4475				
8518321		864A184		3.08	40.03333	38.5275	30.98333	38.895				

Bill Of Lading # 80096408

Roll #	ASTM D-4632 GRAB TENSILE (LBS) W X F	GRAB ELONGATION ASTM D-4632 (%) W x F	ASTM D-5261 MASS/UNIT AREA OZ/SQ YARD
Product : 864A 8501425	75 x 45	28 x 37	2.95

TOTAL P.02



# SYNTHETIC INDUSTRIES

## Geosynthetic Products Division

American Colloid-Fairmount, G  
Alisa Findley  
P.O. Box 88  
Fairmont GA 30139  
BOL 80097569 PO O-OCW-30799  
Ref:

4/11/2001

This is to certify that Product GEOTEX 864A, a nonwoven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level. This geotextile has been continuously inspected for the presence of needles and none were detected.

<u>Physical Property</u>	<u>Test Method</u>	<u>US Units</u>		<u>SI Unit</u>	
Mass Per Unit Area	ASTM D-5261	2.8	oz/yd <sup>2</sup>	(94.92)	g/m <sup>2</sup>
Thickness	ASTM D-5199		mils	( )	mm
Tensile Strength	ASTM D-4632	75	lbs	(333.75)	N
Elongation	ASTM D-4632	16	%	16	%
Trapezoidal Tear	ASTM D-4533		lbs	( )	N
Mullen Burst	ASTM D-3786	170	psi	(1171.9)	kPa
Puncture Strength	ASTM D-4833		lbs	( )	N
A.O.S.	ASTM D-4751		Sieve		mm
Permittivity	ASTM D-4491		sec-1		sec-1
Permeability	ASTM D-4491		cm/sec		cm/sec
Water Flow Rate	ASTM D-4491		gpm/ft <sup>2</sup>	( )	lpm/m <sup>2</sup>
UV Resistance	ASTM D-4355	90	%	90	%

Strength Retained after 500 hours exposure in Xenon Arc Weatherometer

Sincerely,

Sid Weiser  
Product Manager  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

11/1/2000

**Synthetic Industries, Inc.**

4019 Industry Drive • Chattanooga, Tennessee • 37416 • USA  
Telephone • 423-899-0444 • Fax • 423-899-7619 • 1-800-621-0444

Roll Num	Style	Weight	Tensile		Elongation	
			W	F	W	F
8501430	864A	2.93	80.2	40.1	24.0	34.6
8503602	864A	2.95	42.0	45.3	27.6	37.2
8516139	864A	3.05	86.8	38.3	25.0	38.9
8518317	864A	3.20	62.6	43.7	23.3	38.3
8519351	864A	2.86	46.8	38.2	23.7	37.7
8533101	864A	2.97	55.9	41.6	24.5	39.2

BOL 80097569



American Colloid-Fairmount, GA  
Alisa Findley  
P.O. Box 88  
Fairmont GA 30139  
BOL 80096408 PO  
Ref:

5/24/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75 X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.9
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

Frank P. Pace, P.E.  
Manager - Engineering Services  
SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is 11/1/2000



rollno	fabwht	wtensl	welong	ftensl	felong
8501430	2.93	80.2	24.0	40.1	34.6
8501431	3.11	73.1	22.1	41.6	36.2
8503598	3.05	92.8	25.1	44.7	36.9
8503602	2.95	42.0	27.6	45.3	37.2
8516136	3.03	75.3	28.3	41.2	38.4
8516139	3.05	86.8	25.0	38.3	38.9
8516140	3.07	46.3	29.4	42.3	36.4
8516143	3.09	35.3	29.9	44.6	37.1
8516145	2.93	59.5	25.0	41.7	37.2
8518317	3.20	62.6	23.3	43.7	38.3
8518317	3.19	67.4	26.0	41.2	39.7
8518321	3.08	40.0	31.0	38.5	38.9
8519350	3.02	63.5	25.6	40.2	36.6
8519351	2.86	46.8	23.7	38.2	37.7
8519356	3.03	61.7	25.1	35.7	37.3
8519359	3.15	41.4	27.2	40.4	39.8
8533100	3.00	44.3	26.0	42.2	34.0
8533101	2.97	55.9	24.5	41.6	39.2
8533102	3.05	68.8	26.6	84.5	62.8
8533106	3.05	46.3	28.9	39.4	39.0
8534991	2.99	82.0	34.6	89.5	61.8
8534994	3.10	77.5	23.1	39.7	35.1
8534997	3.05	86.3	28.6	84.0	72.2
8535782	3.01	63.6	26.2	74.9	49.6
8535786	2.91	88.4	33.6	37.6	37.4
8547087	3.24	63.5	26.2	32.5	40.6
8547088	3.09	0.0	0.0	0.0	0.0
8547088	3.09	62.6	23.3	43.7	38.4
8547089	2.79	42.9	24.2	37.5	42.1
8547095	3.17	85.6	30.4	36.9	35.8
8547096	3.25	37.3	31.9	37.8	39.2
8547494	3.14	66.2	27.2	35.5	38.0
8547496	3.09	68.4	27.0	39.4	40.9
8547498	3.28	106.4	28.2	77.5	30.7
8547501	3.00	158.4	37.3	110.6	27.1
8550748	2.98	79.2	26.4	47.0	36.1
8550751	2.98	31.8	23.9	38.9	39.6
8550754	2.91	76.5	28.0	37.8	42.0
8550757	2.98	63.5	26.2	32.5	40.6
8562490	3.03	85.2	27.4	37.4	38.6
8562492	3.04	50.9	25.2	36.3	42.2
8562497	3.03	50.8	39.1	34.8	41.5
8562498	3.00	76.4	28.2	43.9	35.1
8563583	2.90	58.3	25.9	43.0	37.1
8563585	2.92	44.1	26.4	35.7	38.8
8563586	3.05	70.4	24.7	38.8	39.3
8578510	3.15	72.1	24.4	39.3	38.5
8578516	2.92	62.9	27.9	32.1	36.5
8578517	2.99	60.2	26.0	30.3	32.0

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422519  
as requested on your order no.

17-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	7.2
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442244

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 453302  
as requested on your order no.

17-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	8.4
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	12.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 450330

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 455975  
as requested on your order no.

30-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	1
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	27
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455004

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 420127  
as requested on your order no.

07-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455015

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 423457  
as requested on your order no.

20-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	13.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455019

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 453791  
as requested on your order no.

04-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455010

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 420719  
as requested on your order no.

18-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	9.6
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	13.6

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455016



# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422542  
as requested on your order no.

31-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455005

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 453204  
as requested on your order no.

15-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	9.2
FREE SWELL	ASTM D 5890	24 MIN.	25
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442240

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 02-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 421014  
as requested on your order no.

20-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.3
MOISTURE	ASTM D 2216	12.0% MAX.	9
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442213

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.  
2306 Gravel Drive

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

6 print(s) each of the following Submittal: D-02275-016-A (QA/QC Roll Certificates: Claymax 200R  
(Set 2 of 4) (45 rolls))

which are:

- |    |                                  |                                     |
|----|----------------------------------|-------------------------------------|
| 1. | APPROVED .....                   | <input checked="" type="checkbox"/> |
| 2. | APPROVED AS NOTED .....          | <input type="checkbox"/>            |
| 3. | APPROVED AS NOTED/CONFIRM .....  | <input type="checkbox"/>            |
| 4. | APPROVED AS NOTED/RESUBMIT ..... | <input type="checkbox"/>            |
| 5. | NOT APPROVED .....               | <input type="checkbox"/>            |
| 6. | COMMENTS ATTACHED .....          | <input type="checkbox"/>            |
| 7. | FOR YOUR INFORMATION .....       | <input type="checkbox"/>            |
| 8. | FOR YOUR REVIEW .....            | <input type="checkbox"/>            |

Comments: \_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-19-01

Submittal Identifier:	<u>D-02275-016-A</u>	<input checked="" type="checkbox"/> Original Submittal	<input type="checkbox"/> Supplement
Submitted:	<u>November 19, 2001</u>	<input type="checkbox"/> Resubmittal	<input type="checkbox"/> Information Only
No. of Copies:	<u>8</u>		

Submittal Description: QA/QC Roll Certificates: Claymax 200R (Set 2 of 4) (45 rolls)

Specification Identifier: 01300, 02275 Section 1.03A.1 (e)

Manufacturer: CETCO Lining Technologies, Inc.

Installer: COMANCO Environmental Corporation

**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:	<input type="checkbox"/> Code 1 - Approved	<input type="checkbox"/> Code 4 - Approved As Noted, Resubmit
	<input type="checkbox"/> Code 2 - Approved As Noted	<input type="checkbox"/> Code 5 - Not Approved
	<input type="checkbox"/> Code 3 - Approved As Noted, Confirm	<input type="checkbox"/> Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b>	<b>RESPONSE REQUIRED OF CONTRACTOR</b>
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>
Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>
The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.	
By <u>AMS</u>	Date <u>12/3/01</u>

# **GEOSYNTHETIC CLAY LINER**

## **MANUFACTURING QA / QC DATA PACKAGE**

<b>PROJECT NAME:</b>	<b>Pasco County Landfill Spring Hill, FL. 34610</b>
<b>CUSTOMER P.O.:</b>	<b>3256-000-OD</b>
<b>PREPARED FOR:</b>	<b>GSE Lining Technology, Inc. 19103 Gundle Road Houston TX. 77073</b>
<b>Telephone # :</b>	<b>800-435-2008</b>
<b>PREPARED BY:</b>	<b>NOE GARCIA Quality Assurance Coordinator CETCO P.O. Box 428 92 Hwy. 37 Lovell, Wy. 82431</b>
<b>Telephone #:</b>	<b>800-322-1149 ( Ext. 423 )</b>
<b>Fax #:</b>	<b>(307)548-6927, (307)548-6413</b>
<b>E-Mail:</b>	<b>ngarc@cetco.com</b>

# **GEOSYNTHETIC CLAY LINER**

## **MANUFACTURING QA / QC DATA**

### **FOR ALL GCL MANUFACTURED ON:**

Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150065, 150066, 150067
Ship Date:	12/5

## **CONTENTS:**

1. PACKING LIST
2. DAILY CLAYMAX PRODUCTION CERTIFICATION
3. BENTONITE CLAY CERTIFICATION
4. CLAYMAX MANUFACTURING CERTIFICATION AND TEST RESULTS
5. CLAYMAX MQA TRACKING FORM

**GEOSYNTHETIC CLAY LINER  
MANUFACTURING CERTIFICATION**

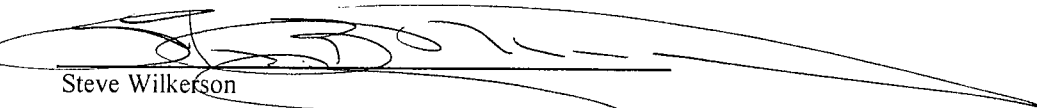


# GEOSYNTHETIC CLAY LINER

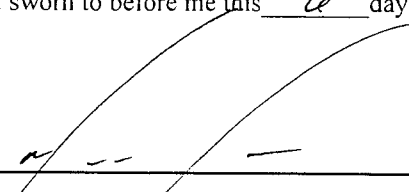
## MANUFACTURING CERTIFICATION

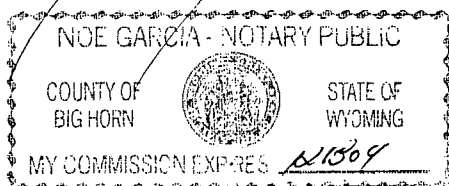
Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150065, 150066, 150067
Ship Date:	5-Dec

**Colloid Environmental Technologies Company ( CETCO )** hereby affirms and certifies that all of the Claymax 200R manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

  
Steve Wilkerson  
Plant Manager

Subscribed and sworn to before me this 6 day of November 2001.

  
\_\_\_\_\_  
Notary-Public



# **BENTONITE CLAY CERTIFICATIONS**

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**TECHNICAL DATA SHEET**

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**ORIGIN INFORMATION**

**BENTONITE**

Manufacturer: **AMERICAN COLLOID COMPANY**

**PRODUCTION**

Facility: **AMERICAN COLLOID COMPANY  
92 HWY. 37  
Lovell, WY 82431**

Contact: **Moses Briseno  
Quality Assurance Coordinator  
(800)-322-1160**

Brand Name: **CG 50**

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID

92 HWY. 37  
LOVELL, WY 82431

TO: CETCO - LOVELL PLANT  
P.O. BOX 428  
92 HWY 37  
LOVELL, WY. 82431

DATE: 31-Oct-01

ATTN: NOE GARCIA

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on 103101B  
in TANK A  
as requested on your order no. VERBAL

sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0 PERCENT	0
Passing 200 Mesh	ASTM D 421	1 % ( Max )	0.5
Moisture	ASTM D 2216	12.0 % ( MAX )	8.4
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	24.0
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )	12.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M., D.M., C.L., I.G.

Approved By: MOSES BRISENO  
ACC

In any correspondence regarding this shipment, please refer to our  
Order Number NA

# BENTONITE CERTIFICATE OF ANALYSIS

## AMERICAN COLLOID

92 HWY. 37  
LOVELL, WY 82431

TO: CETCO - LOVELL PLANT  
P.O. BOX 428  
92 HWY 37  
LOVELL, WY. 82431

DATE: 31-Oct-01

ATTN: NOE GARCIA

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on 103101C  
in TANK A  
as requested on your order no. VERBAL

sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0 PERCENT	0
Passing 200 Mesh	ASTM D 421	1 % ( Max )	0.7
Moisture	ASTM D 2216	12.0 % ( MAX )	6.8
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	24.0
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )	12.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M., D.M., C.L., I.G.

Approved By: MOSES BRISENO  
ACC

In any correspondence regarding this shipment, please refer to our  
der Number NA

# **GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS**

# GEOSYNTHETIC CLAY LINER

## MANUFACTURING CERTIFICATION

Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150065, 150066, 150067
Ship Date:	5-Dec

CETCO hereby affirms and certifies that the Claymax 200R material supplied to this project will meet the physical and chemical criteria listed below.

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>MINIMUM VALUE</u>
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )
Bentonite Mass / Area	ASTM D 5993	* .75 lb/sq.ft. (Min.)
Grab Strength	ASTM D 4632	150 lbs. MARV (machine direction)
Grab Elongation	ASTM D 4632	15 Percent Typical
Permeability	ASTM D 5084	5 x 10 ( -9 ) cm/sec. ( Max )
Index Flux	ASTM D 5887	1.0 x 10 (-8) m(3)/m(2)/sec. (max. )

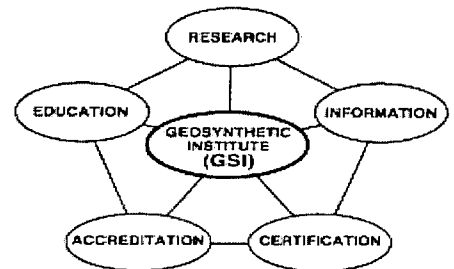
\* Reported at 0 % moisture content.

GAI Lab Accredited Test Methods were followed during conformance testing for:

ASTM D 4632 - Grab Strength and Grab Elongation.

ASTM D 5887 - Index Flux.

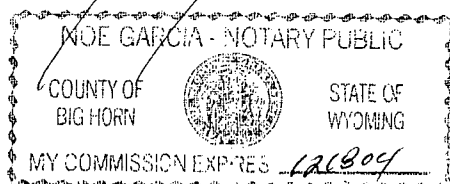
ASTM D 5993 - Bentonite Mass/Area.



Colloid Environmental Technologies Co. (CETCO)

Subscribed and sworn to before me this 4 day of November 2001.

Notary-Public



QCG#FT2 QCT#FT2  
11/06/01 11:27:17

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150065

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00002048	.95	245.00
LO-CLAYMAX200R	200144LO	00002047	.95	245.00
LO-CLAYMAX200R	200144LO	00002046	.95	245.00
LO-CLAYMAX200R	200144LO	00002045	.95	245.00
LO-CLAYMAX200R	200144LO	00002044	.95	245.00
LO-CLAYMAX200R	200144LO	00002043	.95	245.00
LO-CLAYMAX200R	200144LO	00002042	.95	245.00
LO-CLAYMAX200R	200144LO	00002041	.95	245.00
LO-CLAYMAX200R	200144LO	00002040	.95	245.00
LO-CLAYMAX200R	200144LO	00002039	.95	245.00
LO-CLAYMAX200R	200144LO	00002038	.95	245.00
LO-CLAYMAX200R	200144LO	00002037	.95	245.00
LO-CLAYMAX200R	200144LO	00002036	.95*	245.00
LO-CLAYMAX200R	200144LO	00002021	.95	245.00
LO-CLAYMAX200R	200144LO	00002019	.95*	245.00

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*



QCG#FT2 QCI#FT2  
11/06/01 11:28:05

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150066

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00002007	.93	245.00
LO-CLAYMAX200R	200144LO	00002001	.93	245.00
LO-CLAYMAX200R	200144LO	00002000	.93	245.00
LO-CLAYMAX200R	200144LO	00001999	.93	245.00
LO-CLAYMAX200R	200144LO	00001998	.93	245.00
LO-CLAYMAX200R	200144LO	00001997	.93	245.00
LO-CLAYMAX200R	200144LO	00001996	.93	245.00
LO-CLAYMAX200R	200144LO	00001995	.93	245.00
LO-CLAYMAX200R	200144LO	00001994	.93	245.00
LO-CLAYMAX200R	200144LO	00001993	.93	245.00
LO-CLAYMAX200R	200144LO	00001990	.93	245.00
LO-CLAYMAX200R	200144LO	00001989	.93	245.00
LO-CLAYMAX200R	200144LO	00001987	.93	245.00
LO-CLAYMAX200R	200144LO	00001986	.93	245.00
LO-CLAYMAX200R	200144LO	00001985	.93*	245.00

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*

QCG#FT2 OCT#FT2  
11/06/01 11:28:54

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150067

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00002024	.95	245.00
LO-CLAYMAX200R	200144LO	00002018	.93	245.00
LO-CLAYMAX200R	200144LO	00002017	.93	245.00
LO-CLAYMAX200R	200144LO	00002016	.93	245.00
LO-CLAYMAX200R	200144LO	00002015	.93	245.00
LO-CLAYMAX200R	200144LO	00002014	.93	245.00
LO-CLAYMAX200R	200144LO	00002013	.93	245.00
LO-CLAYMAX200R	200144LO	00002012	.93	245.00
LO-CLAYMAX200R	200144LO	00002011	.93	245.00
LO-CLAYMAX200R	200144LO	00002010	.93	245.00
LO-CLAYMAX200R	200144LO	00002006	.93	245.00
LO-CLAYMAX200R	200144LO	00002005	.93	245.00
LO-CLAYMAX200R	200144LO	00002004	.93	245.00
LO-CLAYMAX200R	200144LO	00002003	.93	245.00
LO-CLAYMAX200R	200144LO	00002002	.93*	245.00

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*

# **GEOSYNTHETIC CLAY LINER MQA TRACKING FORMS**

QCG#TF1 QCT#TF1  
11/06/01 11:27:17

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000150065  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00002019	LO-CLAYMAX200R	150	2250	3017	8610898		8681806		103101B
00002021	LO-CLAYMAX200R	150	2250	3033	8610898		8681806		103101B
00002036	LO-CLAYMAX200R	150	2250	3055	8610898		8680235		103101C
00002037	LO-CLAYMAX200R	150	2250	3053	8610898		8680235		103101C
00002038	LO-CLAYMAX200R	150	2250	3047	8610898		8680235		103101C
00002039	LO-CLAYMAX200R	150	2250	3061	8694475		8680235		103101C
00002040	LO-CLAYMAX200R	150	2250	3096	8694475		8680235		103101C
00002041	LO-CLAYMAX200R	150	2250	3047	8694475		8680235		103101C
00002042	LO-CLAYMAX200R	150	2250	3039	8694475		8680235		103101C
00002043	LO-CLAYMAX200R	150	2250	3036	8694475		8680235		103101C
00002044	LO-CLAYMAX200R	150	2250	3031	8694475		8680235		103101C
00002045	LO-CLAYMAX200R	150	2250	3034	8694475		8680235		103101C
00002046	LO-CLAYMAX200R	150	2250	3025	8694475		8680235		103101C
00002047	LO-CLAYMAX200R	150	2250	3026	8694475		8680235		103101C
00002048	LO-CLAYMAX200R	150	2250	3035	8694475		8680235		103101C

TOTAL SQUARE FEET.....

33.750

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/06/01 11:28:05

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000150066  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00001985	LO-CLAYMAX200R	150	2250	3059	8534991		8648579		103101B
00001986	LO-CLAYMAX200R	150	2250	3046	8534991		8648579		103101B
00001987	LO-CLAYMAX200R	150	2250	3049	8534991		8648579		103101B
00001989	LO-CLAYMAX200R	150	2250	3023	8534991		8648579		103101B
00001990	LO-CLAYMAX200R	150	2250	3046	8534991		8648579		103101B
00001993	LO-CLAYMAX200R	150	2250	3041	8534991		8681806		103101B
00001994	LO-CLAYMAX200R	150	2250	3042	8534991		8681806		103101B
00001995	LO-CLAYMAX200R	150	2250	3049	8534991		8681806		103101B
00001996	LO-CLAYMAX200R	150	2250	3050	8534991		8681806		103101B
00001997	LO-CLAYMAX200R	150	2250	3040	8534991		8681806		103101B
00001998	LO-CLAYMAX200R	150	2250	3039	8534991		8681806		103101B
00001999	LO-CLAYMAX200R	150	2250	3026	8534991		8681806		103101B
00002000	LO-CLAYMAX200R	150	2250	3019	8534991		8681806		103101B
00002001	LO-CLAYMAX200R	150	2250	3021	8534991		8681806		103101B
00002007	LO-CLAYMAX200R	150	2250	3032	8534991		8681806		103101B

TOTAL SQUARE FEET.....

33.750

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/06/01 11:28:54

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000150067  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00002002	LO-CLAYMAX200R	150	2250	3026	8534991		8681806		103101B
00002003	LO-CLAYMAX200R	150	2250	3010	8534991		8681806		103101B
00002004	LO-CLAYMAX200R	150	2250	3011	8534991		8681806		103101B
00002005	LO-CLAYMAX200R	150	2250	3012	8534991		8681806		103101B
00002006	LO-CLAYMAX200R	150	2250	3026	8534991		8681806		103101B
00002010	LO-CLAYMAX200R	150	2250	3049	8610898		8681806		103101B
00002011	LO-CLAYMAX200R	150	2250	3022	8610898		8681806		103101B
00002012	LO-CLAYMAX200R	150	2250	3046	8610898		8681806		103101B
00002013	LO-CLAYMAX200R	150	2250	3044	8610898		8681806		103101B
00002014	LO-CLAYMAX200R	150	2250	3045	8610898		8681806		103101B
00002015	LO-CLAYMAX200R	150	2250	3039	8610898		8681806		103101B
00002016	LO-CLAYMAX200R	150	2250	3027	8610898		8681806		103101B
00002017	LO-CLAYMAX200R	150	2250	3015	8610898		8681806		103101B
00002018	LO-CLAYMAX200R	150	2250	3015	8610898		8681806		103101B
00002024	LO-CLAYMAX200R	150	2250	3037	8610898		8681806		103101B

TOTAL SQUARE FEET.....

33,750

TOTAL PAGES 1

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.  
2306 Gravel Drive

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

6 print(s) each of the following Submittal: D-02275-017-A (QA/QC Roll Certificates: Claymax 200R  
(Set 3 of 4) (15 rolls))

which are:

- |    |                                  |                                     |
|----|----------------------------------|-------------------------------------|
| 1. | APPROVED .....                   | <input checked="" type="checkbox"/> |
| 2. | APPROVED AS NOTED .....          | <input type="checkbox"/>            |
| 3. | APPROVED AS NOTED/CONFIRM .....  | <input type="checkbox"/>            |
| 4. | APPROVED AS NOTED/RESUBMIT ..... | <input type="checkbox"/>            |
| 5. | NOT APPROVED .....               | <input type="checkbox"/>            |
| 6. | COMMENTS ATTACHED .....          | <input type="checkbox"/>            |
| 7. | FOR YOUR INFORMATION .....       | <input type="checkbox"/>            |
| 8. | FOR YOUR REVIEW .....            | <input type="checkbox"/>            |

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527


Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-19-01Submittal Identifier: D-02275-017-A

Original Submittal

Supplement

Submitted: November 19, 2001No. of Copies: 8

Resubmittal

Information Only

Submittal Description: QA/QC Roll Certificates: Claymax 200R (Set 3 of 4) (15 rolls)Specification Identifier: 01300, 02275 Section 1.03A.1 (c)Manufacturer: CETCO Lining Technologies, Inc.Installer: COMANCO Environmental Corporation**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

Code 1 - Approved

Code 4 - Approved As Noted, Resubmit

Code 2 - Approved As Noted

Code 5 - Not Approved

Code 3 - Approved As Noted, Confirm

Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
ENGINEER'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/> Approved as Noted <input type="checkbox"/> Not Approved <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.</p> <p>By <u>AMC</u> Date <u>12/3/01</u></p>	





# GEOSYNTHETIC CLAY LINER

## MANUFACTURING

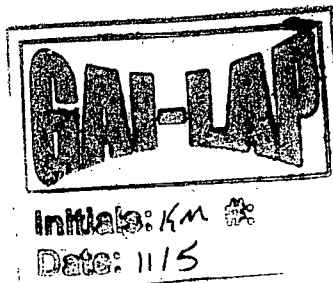
## QA/QC DATA PACKAGE

PROJECT NAME: GSE/Pasco County LF.

PREPARED FOR: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

PREPARED BY: Kelly Miller  
CETCO  
234 Gordon St. S.E.  
Fairmount, GA 30139

TELEPHONE: (706) 337-5316  
FAX: (706) 337-2215





# GEOSYNTHETIC CLAY LINER

## DAILY MANUFACTURING QA/QC DATA

FOR ALL GCL MANUFACTURED ON:

GSE/PASCO COUNTY LF.  
SPRING HILL, FL  
PURCHASE ORDER # 3256-000-OD  
CETCO ORDER(S) #148680

### CONTENTS:

1. DAILY GCL PRODUCTION CERTIFICATION
2. GCL MANUFACTURING CERTIFICATION AND TEST RESULTS
3. GCL MQA TRACKING FORM





# **DAILY GEOSYNTHETIC CLAY LINER PRODUCTION CERTIFICATION**





## GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

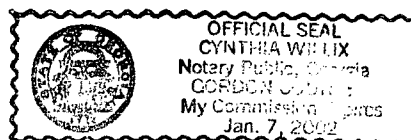
CETCO JOB:	GSE/PASCO COUNTY LF.
DATE:	NOVEMBER 5, 2001
ORDER#(S):	148680
PRODUCT:	CLAYMAX200R

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the Geosynthetic Clay Liner (GCL) manufactured in this lot achieves the physical and chemical criteria listed on the attached sheets.

Kelly Miller  
Quality Analysis Coordinator  
CETCO-Colloid Environmental Technologies CO

Subscribed and sworn to before me this 5 day of Nov., 2001.

Notary Public





# CLAYMAX 200R MANUFACTURING CERTIFICATION

TO: Ms. Sherri Sim-Connell  
GSE  
19103 Gundle Rd.  
Houston, TX 77073

ORDER # 148680

CETCO hereby affirms and certifies that Claymax 200R material supplied to this project will meet the physical and chemical criteria listed below:

PROPERTY	TEST METHOD	REQUIRED VALUE
<i>Bentonite</i>		
Free Swell	ASTM D 5890	24 min.
Fluid Loss	ASTM D 5891	18 max.
<i>Finished Product</i>		
Bentonite Mass/Area	ASTM D 5993	0.75 lb/sq.ft. min.
Grab Strength	ASTM D 4632	90 lbs. MARV
Index Flux	ASTM D 5887	1 x 10 <sup>(-8)</sup> m3/m2/sec (max.)
Permeabilty	ASTM D 5084	max. 5 x 10 <sup>(-9)</sup> cm/sec

\* Reported at 0% moisture content.

GAI Lab Accredited Test Methods were followed during conformance testing for :

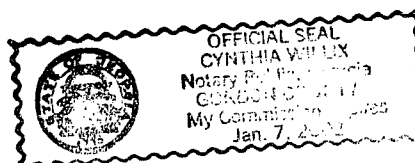
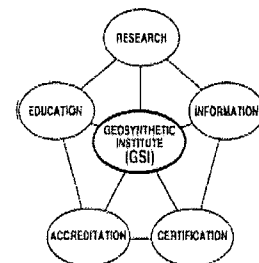
ASTM D 5993 - Bentonite Mass/Area

ASTM D 4632 - Grab Strength and Grab Elongation

Kelly Miller  
CETCO-Colloid Environmental Technologies Co.

Subscribed and sworn to before me this 5 day of Nov., 2001

Cynthia Wilcox  
Notary Public

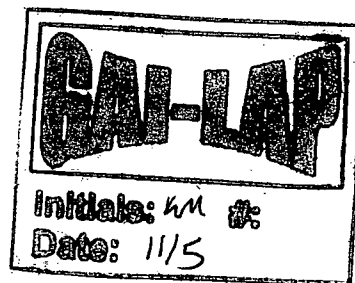




# **GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS**



QCG#FT2 QCT#FT2  
11/05/01 9:23:32



CETCO

PAGE: 1

GCL QUALITY DATA

FAIRMOUNT CETCO

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

O R D E R # 000148680

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75 lb marv ASTM D 4632
FA-CLAYMAX200R	200142FA	00001508	.75	207.80
FA-CLAYMAX200R	200142FA	00001343	.83	204.60
FA-CLAYMAX200R	200142FA	00001316	.84	204.60
FA-CLAYMAX200R	200142FA	00001285	.85	204.60
FA-CLAYMAX200R	200142FA	00001280	.89	194.20
FA-CLAYMAX200R	200141FA	00001273	.89	194.20
FA-CLAYMAX200R	200141FA	00001234	.84	190.10
FA-CLAYMAX200R	200140FA	00001153	.84	198.60
FA-CLAYMAX200R	200138FA	00001058	.86	200.30
FA-CLAYMAX200R	200132FA	00001053	.86	200.30
FA-CLAYMAX200R	200132FA	00001031	.90	200.30
FA-CLAYMAX200R	200132FA	00001020	.88	200.30
FA-CLAYMAX200R	200129FA	00000897	.87	197.50
FA-CLAYMAX200R	200129FA	00000810	.99	171.40
FA-CLAYMAX200R	200129FA	00000795	.83	229.70

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Mass Area and Moisture content are tested a minimum of every 40,000sf.  
Grab Strength is tested a minimum of every 200,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Elongation is tested a minimum of every 200,000sf.

\*\*\* End of Report \*\*\*



# **GEOSYNTHETIC CLAY LINER MQA TRACKING FORMS**





QCG#TF1 QCT#TF1  
11/05/01 9:23:32

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000148680  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200129FA 00000795	FA-CLAYMAX200R	150	2175	4000	8547094		8503600		454241
00000810	FA-CLAYMAX200R	150	2175	3424	8547094		8503600		454241
00000897	FA-CLAYMAX200R	150	2175	3100	8550754		8519352		421014
LOT# 200132FA 00001020	FA-CLAYMAX200R	150	2175	3269	8518318		8535786		422519
00001031	FA-CLAYMAX200R	150	2175	3265	8518318		8535786		422519
00001053	FA-CLAYMAX200R	150	2175	3033	8550750		8547497		422519
LOT# 200138FA 00001058	FA-CLAYMAX200R	150	2175	3201	8550750		8547497		422519
LOT# 200140FA 00001153	FA-CLAYMAX200R	150	2175	2802	8663272		8679752		455975
LOT# 200141FA 00001234	FA-CLAYMAX200R	150	2175	2688	8578517		8681804		420127
00001273	FA-CLAYMAX200R	150	2175	2855	8595180		8563578		420127
LOT# 200142FA 00001280	FA-CLAYMAX200R	150	2175	2828	8595180		8592719		420127
00001285	FA-CLAYMAX200R	150	2175	2820	8595180		8592719		420127
00001316	FA-CLAYMAX200R	150	2175	2871	8595174		8638757		422542
00001343	FA-CLAYMAX200R	150	2175	2869	8566826		8638757		422542
00001508	FA-CLAYMAX200R	150	2175	2843	8503603		8581416		453791

TOTAL SQUARE FEET.....

321625



American Colloid Cetco WY

10/4/2001

Noe Garcia

PO Box 428

Lovell WY 82431

BOL 80125655 PO OCW-32374

Ref:

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd <sup>2</sup> - (g/m <sup>2</sup> )	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivity	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m <sup>2</sup> )		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.

Regional Engineer

SI Geosolutions

Seller makes no warranty express or implied concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IF IT IS CONTRARY TO THE FOREGOING SENTENCE ANY IMPLIED WARRANTY OF MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by the Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be achieved. If the product does not meet S I Corporation current published specifications, and the Customer gives notice to S I Corporation before installing the product, then S I Corporation will replace the product without charge or refund the purchase price. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice. The effective date for this product data is

11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80125655		MD	XMD	MD	XMD
8563583	864A184	2.9	58	43	26	37
8579959	864A184	3.0	55	30	26	39
8581417	864A184	3	83	42	27	36



**SI Geosolutions**

American Colloid-Fairmount, GA  
 Kelly Miller  
 P.O. Box 88  
 Fairmont GA 30139  
 BOL 80103182 PO O-OCW-31055  
 Ref:

5/11/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
 Regional Engineer  
 SI Geosolutions

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11/1/2000

Roll#	Batch	Weight	Tensile		Elongation	
BOL# 'S	80103182		MD	XMD	MD	XMD
8533102	864A	3.05	68.8	26.6	84.5	62.8
8534994	864A	3.10	77.5	23.1	39.7	35.1
8535786	864A	2.91	88.4	33.6	37.6	37.4
8550748	864A	2.98	79.2	26.4	47.0	36.1
8562497	864A	3.03	50.8	39.1	34.8	41.5

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of woven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80128021 PO

10/15/2001

Ref:

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80127262		MD	XMD	MD	XMD
			D4632	D4632	D4632	D4632
8592722	864A	2.75	68.0	35.4	23.7	37.2
8595171	864A	3.00	73.1	41.6	24.9	35.4
8592713	864A	3.04	80.8	48.0	25.3	35.3
8595173	864A	3.00	79.8	40.6	26.2	37.2
8562497	864A	3.03	50.8	39.1	34.8	41.5
8503602	864A	2.95	42.0	45.3	27.6	37.2



**SI Geosolutions**

American Colloid-Fairmount, GA  
 Kelly Miller  
 P.O. Box 88  
 Fairmont GA 30139  
 BOL 80097947 PO  
 Ref:

5/24/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
 Regional Engineer  
 SI Geosolutions

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11/1/2000



Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80097947		MD	XMD	MD	XMD
8501430	864A	2.93	80.2	40.1	24.0	34.6
8516145	864A	2.93	59.5	41.7	25.0	37.2
8518313	864A	3.20	62.6	43.7	23.3	38.3
8518317	864A	3.19	67.4	41.2	26.0	39.7
8519350	864A	3.02	63.5	40.2	25.6	36.6
8519352	864A	2.86	46.8	38.2	23.7	37.7
8519356	864A	3.03	61.7	35.7	25.1	37.3
8533100	864A	3.00	44.3	42.2	26.0	34.0
8533102	864A	3.05	68.8	84.5	26.6	62.8
8533107	864A	3.05	46.3	39.4	28.9	39.0
8534991	864A	2.99	82.0	89.5	34.6	61.8
8535786	864A	2.91	88.4	37.6	33.6	37.4

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

Once rolls of woven geotextiles are produced, inspected and the test results from the frequency stated above indicates that materials produced during the production run meets our published minimum average roll values, approved rolls are shipped for storage until an order requires the material to be shipped. Since rolls are loaded at the warehouse independent of production sequence test results listed above may include data from rolls which were not shipped. However, the data provided is from the same production run as the rolls actually shipped on this bill of lading.



American Colloid-Fairmount, GA  
Kelly Miller  
P.O. Box 88  
Fairmont GA 30139  
BOL 80103162 PO O-OCW-31055  
Ref:

5/11/2001

This is to certify that Product 864A, a woven polypropylene geotextile produced by S I Corporation, will meet the following certifiable minimum average values when tested in accordance with the proper ASTM test methods. A minimum average roll value is calculated as the mean minus two standard deviations, yielding a 97.5 percent confidence level.

<u>Physical Property</u>	<u>Test Method</u>	<u>MARV</u>	<u>SI Units</u>
Mass Per Unit Area	ASTM D-5261 oz/yd2 - (g/m2)	2.80	(94.92)
Thickness	ASTM D-5199 mils - (m)		()
Tensile Strength (Grab)	ASTM D-4632 lb - (N)	75 X 30	(333.75) X (133.5)
Elongation	ASTM D-4632 %	16 X 27	
Trapezoidal Tear	ASTM D-4533 lb - (N)	X	() X ()
Mullen Burst	ASTM D-3786 psi - (Kpa)	170	(1171.98)
Puncture Strength	ASTM D-4833 lb - (N)		()
AOS	ASTM D-4751 US Sieve - (mm)		
Permittivit	ASTM D-4491 SEC-1		
Permeability -	ASTM D-4491 cm - (sec)		
Water Flow Rate	ASTM D-4491 gpm/ft - (lpm/m2)		()
UV Resistance-4	ASTM D-4355 % Retained	90	

Sincerely

John D. Cannon, P.E.  
Regional Engineer  
SI Geosolutions

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11/1/2000

Roll#	Style	Weight	Tensile		Elongation	
BOL# 'S	80103162		MD	XMD	MD	XMD
8503602	864A	2.95	42.0	45.3	27.6	37.2
8534991	864A	2.99	82.0	89.5	34.6	61.8
8535782	864A	3.01	63.6	74.9	26.2	49.6
8547496	864A	3.09	68.4	39.4	27.0	40.9
8550751	864A	2.98	31.8	38.9	23.9	39.6
8562497	864A	3.03	50.8	34.8	39.1	41.5
8563583	864A	2.90	58.3	43.0	25.9	37.1
8563585	864A	2.92	44.1	35.7	26.4	38.8

Synthetic Industries' current standard manufacturing quality control (MQC) testing frequency for GEOTEX woven geotextiles is one (1) test per 90,000 sf (8,360 sm) for index properties (mass per unit area, thickness, grab tensile and elongation, trapezoidal tear, mullen burst and puncture resistance) for styles heavier than 601 and one (1) test per 162,000 sf (15,000 sm) for index properties for style 601 and lighter. Although we strive to test our woven geotextiles for apparent opening size (AOS) and Permittivity/permeability/water flow rate approximately once every 540,000 sf (50,160 sm), the actual frequency of testing for performance properties will vary depending upon production schedules, product availability, customer requirements, job specifications or other agreements arranged with Synthetic Industries prior to the time of purchase. If additional testing is needed to meet higher frequencies required by the project specifications, it is the purchaser's responsibility to notify Synthetic Industries and ask for assistance in calculating the costs for the additional tests.

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# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422519  
as requested on your order no.

17-Jul-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.5
MOISTURE	ASTM D 2216	12.0% MAX.	7.2
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: A.J.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442244

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 455975  
as requested on your order no.

30-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	1
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	27
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRIENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455004

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 420127  
as requested on your order no.

07-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15.4

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455015

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 422542  
as requested on your order no.

31-Aug-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455005

# BENTONITE

## CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.  
  
FAIRMOUNT, GA. 30139

ATTN: KELLY MILLER

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 453791  
as requested on your order no.

04-Sep-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.4
MOISTURE	ASTM D 2216	12.0% MAX.	8
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	15

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 455010



# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BNSF 421014  
as requested on your order no.

20-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	0.3
MOISTURE	ASTM D 2216	12.0% MAX.	9
FREE SWELL	ASTM D 5890	24 MIN.	26
FLUID LOSS	ASTM D 5891	18.0 MAX.	14

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442213

# BENTONITE CERTIFICATE OF ANALYSIS

AMERICAN COLLOID  
92 HWY 37  
LOVELL, WYO. 82431

DATE: 05-Nov-01

TO: CETCO  
234 GORDON ST. S.E.

FAIRMOUNT, GA. 30139

ATTN: ALISA FINDLEY

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on  
in BN 454241  
as requested on your order no.

18-Jun-01

VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0% .	0
PASSING 200 MESH	ASTM C 136	1.0 % MAX	1
MOISTURE	ASTM D 2216	12.0% MAX.	8.8
FREE SWELL	ASTM D 5890	24 MIN.	24
FLUID LOSS	ASTM D 5891	18.0 MAX.	14.2

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: C.L.

Approved By: MOSES BRISENO

ACC

In any correspondence regarding this shipment, please refer to our  
Order Number 442211

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.  
2306 Gravel Drive

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

6 print(s) each of the following Submittal: D-02275-018-A (QA/QC Roll Certificates: Claymax 200R  
(Set 4 of 4) (43 rolls))

which are:

- |    |                                  |                                     |
|----|----------------------------------|-------------------------------------|
| 1. | APPROVED .....                   | <input checked="" type="checkbox"/> |
| 2. | APPROVED AS NOTED .....          | <input type="checkbox"/>            |
| 3. | APPROVED AS NOTED/CONFIRM .....  | <input type="checkbox"/>            |
| 4. | APPROVED AS NOTED/RESUBMIT ..... | <input type="checkbox"/>            |
| 5. | NOT APPROVED .....               | <input type="checkbox"/>            |
| 6. | COMMENTS ATTACHED .....          | <input type="checkbox"/>            |
| 7. | FOR YOUR INFORMATION .....       | <input type="checkbox"/>            |
| 8. | FOR YOUR REVIEW .....            | <input type="checkbox"/>            |

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720


**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-19-01Submittal Identifier: D-02275-018-A

Original Submittal

☐ SupplementSubmitted: November 19, 2001No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: QA/QC Roll Certificates: Claymax 200R (Set 4 of 4) (43 rolls)Specification Identifier: 01300, 02275 Section 1.03A.1 (e)Manufacturer: CETCO Lining Technologies, Inc.Installer: COMANCO Environmental Corporation**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b>	<b>RESPONSE REQUIRED OF CONTRACTOR</b>
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>
Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner. CAMP DRESSER &amp; MCKEE INC.</p>	
By <u>AMS</u>	Date <u>12/3/01</u>



**COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY**

P.O. Box 428 • Lovell, Wyoming 82431  
(307) 548-6521 • Fax (307) 548-6413

**Date:** November 7, 2001  
**PO:** 3256-000-OD  
**Order #:** 150062, 150063, 150064

**Sherri Sim-Connell,  
GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston TX. 77073  
800-435-2008**

**Dear Sherri Sim-Connell,**

**Please find enclosed the MQA/MQC Data Package for GCL shipments  
to GSE Lining Technology, Inc.. These shipments left our  
CETCO - Lovell, Wy. plant on November 6, 2001.**

**If you have any questions regarding the enclosed QA/QC information, please contact  
me at (800)322-1149 ext:423.**

**Sincerely,**

  
**NOE GARCIA**

**Quality Assurance Coordinator**



# **GEOSYNTHETIC CLAY LINER**

## **MANUFACTURING QA / QC DATA PACKAGE**

**PROJECT NAME:** Pasco County Landfill  
Spring Hill, FL. 34610

**CUSTOMER P.O.:** 3256-000-OD

**PREPARED FOR:** GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston TX. 77073

**Telephone # :** 800-435-2008

**PREPARED BY:** NOE GARCIA  
Quality Assurance Coordinator  
CETCO  
P.O. Box 428  
92 Hwy. 37  
Lovell, Wy. 82431

**Telephone #:** 800-322-1149 ( Ext. 423 )

**Fax #:** (307)548-6927, (307)548-6413

**E-Mail:** ngarc@cetco.com

# GEOSYNTHETIC CLAY LINER

## MANUFACTURING QA / QC DATA

### FOR ALL GCL MANUFACTURED ON:

Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150062, 150063, 150064
Ship Date:	11/6

## CONTENTS:

1. PACKING LIST
2. DAILY CLAYMAX PRODUCTION CERTIFICATION
3. BENTONITE CLAY CERTIFICATION
4. CLAYMAX MANUFACTURING CERTIFICATION AND TEST RESULTS
5. CLAYMAX MQA TRACKING FORM

# **GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION**



# GEOSYNTHETIC CLAY LINER

## MANUFACTURING CERTIFICATION

Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150062, 150063, 150064
Ship Date:	6-Nov

**Colloid Environmental Technologies Company ( CETCO )** hereby affirms and certifies that all of the Claymax 200R manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

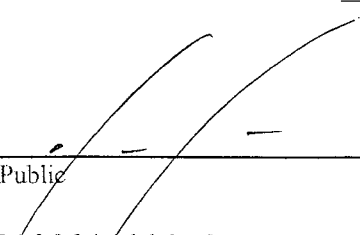
  
\_\_\_\_\_  
Steve Wilkerson

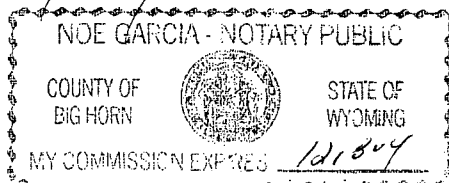
Plant Manager

*Prod. Control*

*Fred Fink*

Subscribed and sworn to before me this 7 day of November 2001.

  
\_\_\_\_\_  
Notary-Public



# **BENTONITE CLAY CERTIFICATIONS**

## TECHNICAL DATA SHEET

### **ORIGIN INFORMATION**

#### **BENTONITE**

Manufacturer: **AMERICAN COLLOID COMPANY**

#### **PRODUCTION**

Facility: **AMERICAN COLLOID COMPANY  
92 HWY. 37  
Lovell, WY 82431**

Contact: **Moses Briseno  
Quality Assurance Coordinator  
(800)-322-1160**

Brand Name: **CG 50**

# BENTONITE CERTIFICATE OF ANALYSIS

## AMERICAN COLLOID

92 HWY. 37  
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**  
**P.O. BOX 428**  
**92 HWY 37**  
**LOVELL, WY. 82431**

DATE: **31-Oct-01**

ATTN: **NOE GARCIA**

Dear Sirs:

A shipment of **CG 50**  
left our Lovell, WY plant on **103101A**  
in **TANK A**  
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0 PERCENT	0
Passing 200 Mesh	ASTM D 421	1 % ( Max )	0.5
Moisture	ASTM D 2216	12.0 % ( MAX )	8.4
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	24.0
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )	12.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: **B.M., D.M., C.L., I.G.**

Approved By: **MOSES BRISENO**  
**ACC**

In any correspondence regarding this shipment, please refer to our  
order Number **NA**

# BENTONITE CERTIFICATE OF ANALYSIS

## AMERICAN COLLOID

92 HWY. 37  
LOVELL, WY 82431

TO: CETCO - LOVELL PLANT  
P.O. BOX 428  
92 HWY 37  
LOVELL, WY. 82431

DATE: 31-Oct-01

ATTN: NOE GARCIA

Dear Sirs:

A shipment of CG 50  
left our Lovell, WY plant on 103101B  
in TANK A  
as requested on your order no. VERBAL

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0 PERCENT	0
Passing 200 Mesh	ASTM D 421	1 % ( Max )	0.5
Moisture	ASTM D 2216	12.0 % ( MAX )	8.4
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	24.0
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )	12.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: B.M., D.M., C.L., I.G.

Approved By: MOSES BRIENO  
ACC

In any correspondence regarding this shipment, please refer to our  
Order Number NA

# BENTONITE CERTIFICATE OF ANALYSIS

## AMERICAN COLLOID

92 HWY. 37  
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**  
**P.O. BOX 428**  
**92 HWY 37**  
**LOVELL, WY. 82431**

DATE: **31-Oct-01**

ATTN: **NOE GARCIA**

Dear Sirs:

A shipment of **CG 50**  
left our Lovell, WY plant on **103101C**  
in **TANK A**  
as requested on your order no. **VERBAL**

sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 10 MESH	ASTM C 136	0 PERCENT	0
Passing 200 Mesh	ASTM D 421	1 % ( Max )	0.7
Moisture	ASTM D 2216	12.0 % ( MAX )	6.8
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	24.0
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )	12.8

We hereby certify that the results shown above represent this shipment.  
Tests were conducted using American Standard Test Methods and/or customer  
approved laboratory procedures.  
Product made in the U.S.A.

Tests Conducted By: **B.M., D.M., C.L., I.G.**

Approved By: **MOSES BRIENO**  
**ACC**

In any correspondence regarding this shipment, please refer to our  
der Number **NA**

# **GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS**

# GEOSYNTHETIC CLAY LINER

## MANUFACTURING CERTIFICATION

Project Name:	Pasco County Landfill
Prepared For:	GSE Lining Technology, Inc.
Customer PO:	3256-000-OD
Order Number:	150062, 150063, 150064
Ship Date:	6-Nov

CETCO hereby affirms and certifies that the Claymax 200R material supplied to this project will meet the physical and chemical criteria listed below.

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>MINIMUM VALUE</u>
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.
Bentonite Fluid Loss	ASTM D 5891	18.0 mL ( MAX )
Bentonite Mass / Area	ASTM D 5993	* .75 lb/sq.ft. (Min.)
Grab Strength	ASTM D 4632	150 lbs. MARV (machine direction)
Grab Elongation	ASTM D 4632	15 Percent Typical
Permeability	ASTM D 5084	$5 \times 10^{-9}$ cm/sec. ( Max )
Index Flux	ASTM D 5887	$1.0 \times 10^{-8}$ m(3)/m(2)/sec. (max. )

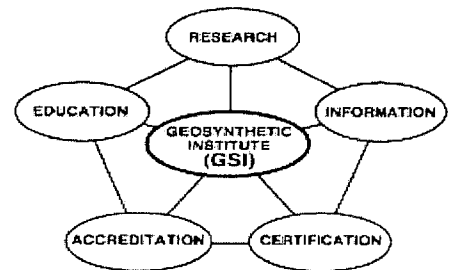
\* Reported at 0 % moisture content.


GAI Lab Accredited Test Methods were followed during conformance testing for:

ASTM D 4632 - Grab Strength and Grab Elongation.

ASTM D 5887 - Index Flux.

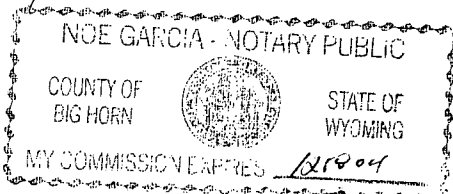
ASTM D 5993 - Bentonite Mass/Area.



  
Colloid Environmental Technologies Co. ( CETCO )

Subscribed and sworn to before me this 7 day of November 2001.

Notary-Public





QCG#FT2 QCT#FT2  
11/07/01 14:57:06

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150062

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00002061	.90	251.50
LO-CLAYMAX200R	200144LO	00002060	.90	251.50
LO-CLAYMAX200R	200144LO	00002059	.90	251.50
LO-CLAYMAX200R	200144LO	00002058	.90	251.50
LO-CLAYMAX200R	200144LO	00002057	.90	251.50
LO-CLAYMAX200R	200144LO	00002056	.90	251.50
LO-CLAYMAX200R	200144LO	00002055	.90	251.50
LO-CLAYMAX200R	200144LO	00002054	.90	251.50
LO-CLAYMAX200R	200144LO	00002053	.90*	251.50*
LO-CLAYMAX200R	200144LO	00002052	.95	245.00
LO-CLAYMAX200R	200144LO	00002035	.95	245.00
LO-CLAYMAX200R	200144LO	00002034	.95	245.00
LO-CLAYMAX200R	200144LO	00002033	.95	245.00
LO-CLAYMAX200R	200144LO	00002032	.95	245.00

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/07/01 14:57:52

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150063

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA ..075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00001992	.93	245.00
LO-CLAYMAX200R	200144LO	00001960	.90	180.40
LO-CLAYMAX200R	200144LO	00001954	.90	180.40
LO-CLAYMAX200R	200144LO	00001952	.90	180.40
LO-CLAYMAX200R	200144LO	00001951	.90*	180.40
LO-CLAYMAX200R	200144LO	00001948	.91	180.40
LO-CLAYMAX200R	200144LO	00001940	.91	180.40
LO-CLAYMAX200R	200144LO	00001939	.91	180.40
LO-CLAYMAX200R	200144LO	00001938	.91	180.40
LO-CLAYMAX200R	200144LO	00001937	.91	180.40
LO-CLAYMAX200R	200144LO	00001936	.91	180.40
LO-CLAYMAX200R	200144LO	00001934	.91*	180.40
LO-CLAYMAX200R	200144LO	00001933	.93	180.40
LO-CLAYMAX200R	200144LO	00001932	.93	180.40
LO-CLAYMAX200R	200144LO	00001931	.93	180.40

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*

QCG#FT2 QCT#FT2  
11/07/01 14:58:39

CETCO

GCL QUALITY DATA

LOVELL CETCO PLANT  
P.O. BOX 428  
LOVELL WY 82431

SHIP TO: PASCO COUN  
COMANCO/HA  
SPRING HIL

O R D E R # 000150054

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .075 lb/sqft ASTM D 5993	GRAB STRENGTH 75lbs marv ASTM D 4632
LO-CLAYMAX200R	200144LO	00002031	.95	245.00
LO-CLAYMAX200R	200144LO	00002030	.95	245.00
LO-CLAYMAX200R	200144LO	00002029	.95	245.00
LO-CLAYMAX200R	200144LO	00002028	.95	245.00
LO-CLAYMAX200R	200144LO	00002027	.95	245.00
LO-CLAYMAX200R	200144LO	00002026	.95	245.00
LO-CLAYMAX200R	200144LO	00002025	.95	245.00
LO-CLAYMAX200R	200144LO	00002009	.93	245.00
LO-CLAYMAX200R	200144LO	00002008	.93	245.00
LO-CLAYMAX200R	200144LO	00001961	.90	180.40
LO-CLAYMAX200R	200144LO	00001957	.90	180.40
LO-CLAYMAX200R	200144LO	00001956	.90	180.40
LO-CLAYMAX200R	200144LO	00001955	.90	180.40
LO-CLAYMAX200R	200144LO	00001953	.90	180.40

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.  
If an asterisk is not present, test results are based on the previous roll tested.  
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.  
Bentonite Mass/Area is reported at 0% moisture content.  
Grab Strength is tested a minimum of every 200,000sf.  
Peel Strength is tested a minimum of every 40,000sf.  
All tensile testing is in the machine direction

\*\*\* End of Report \*\*\*

# **GEOSYNTHETIC CLAY LINER MQA TRACKING FORMS**

QCG#TF1 QCT#TF1  
11/07/01 14:57:06

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000150062  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00002032	LO-CLAYMAX200R	150	2250	3028	8610898		8680235		103101C
00002033	LO-CLAYMAX200R	150	2250	3019	8610898		8680235		103101C
00002034	LO-CLAYMAX200R	150	2250	3025	8610898		8680235		103101C
00002035	LO-CLAYMAX200R	150	2250	3029	8610898		8680235		103101C
00002052	LO-CLAYMAX200R	150	2250	3053	8694475		8680235		103101C
00002053	LO-CLAYMAX200R	150	2250	3067	8694475		8680235		103101C
00002054	LO-CLAYMAX200R	150	2250	3059	8694475		8680235		103101C
00002055	LO-CLAYMAX200R	150	2250	3050	8694475		8680235		103101C
00002056	LO-CLAYMAX200R	150	2250	3045	8694475		8680235		103101C
00002057	LO-CLAYMAX200R	150	2250	3047	8694475		8680235		103101C
00002058	LO-CLAYMAX200R	150	2250	3038	8694475		8680235		103101C
00002059	LO-CLAYMAX200R	150	2250	3041	8694475		8680235		103101C
00002060	LO-CLAYMAX200R	150	2250	3032	8694475		8680235		103101C
00002061	LO-CLAYMAX200R	150	2250	3027	8694475		8680235		103101C

TOTAL SQUARE FEET.....

31.500 /

TOTAL PAGES 1

QCG#TF1 QCT#TF1  
11/07/01 14:57:51

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

ORDER NUMBER 000150063  
-----

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00001931	LO-CLAYMAX200R	150	2250	3102	8688607		8694474		103101A
00001932	LO-CLAYMAX200R	150	2250	3100	8688607		8694474		103101A
00001933	LO-CLAYMAX200R	150	2250	3094	8688607		8694474		103101A
00001934	LO-CLAYMAX200R	150	2250	3080	8688607		8694474		103101A
00001936	LO-CLAYMAX200R	150	2250	3078	8688607		8694474		103101A
00001937	LO-CLAYMAX200R	150	2250	3072	8688607		8694474		103101A
00001938	LO-CLAYMAX200R	150	2250	3069	8688607		8694474		103101A
00001939	LO-CLAYMAX200R	150	2250	3073	8688607		8694474		103101A
00001940	LO-CLAYMAX200R	150	2250	3077	8688607		8694474		103101A
00001948	LO-CLAYMAX200R	150	2250	3047	8694473		8694474		103101B
00001951	LO-CLAYMAX200R	150	2250	3064	8694473		8694474		103101B
00001952	LO-CLAYMAX200R	150	2250	3060	8694473		8694474		103101B
00001954	LO-CLAYMAX200R	150	2250	3040	8694473		8694474		103101B
00001960	LO-CLAYMAX200R	150	2250	3039	8694473		8648579		103101B
00001992	LO-CLAYMAX200R	150	2250	3031	8534991		8648579		103101B

TOTAL SQUARE FEET.....

33,750

TOTAL PAGES 1

QCG#TF1 OCT#TF1  
11/07/01 14:58:38

CETCO  
GCL MQA/MQC TRACKING FORM

PAGE: 1

CETCO  
P.O. BOX 428  
LOVELL

WY 82431

SHIP TO: PASCO COUNTY LF / GSE  
COMANCO/HANDEX  
SPRING HILL FL

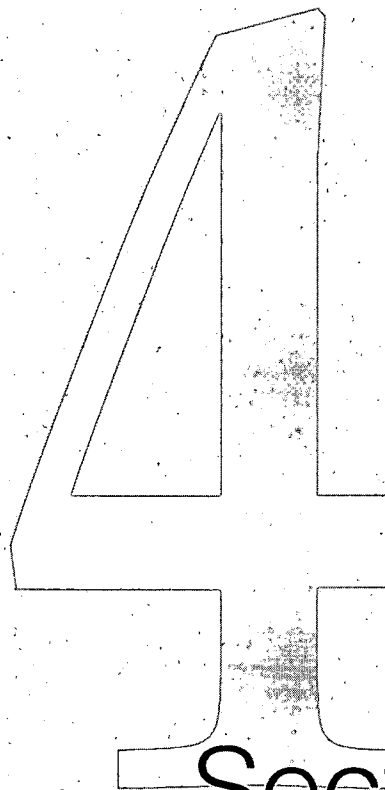
ORDER NUMBER 000150064  
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ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200144LO									
00001953	LO-CLAYMAX200R	150	2250	3050	8694473		8694474		103101B
00001955	LO-CLAYMAX200R	150	2250	3045	8694473		8648579		103101B
00001956	LO-CLAYMAX200R	150	2250	3055	8694473		8648579		103101B
00001957	LO-CLAYMAX200R	150	2250	3065	8694473		8648579		103101B
00001961	LO-CLAYMAX200R	150	2250	3047	8694473		8648579		103101B
00002008	LO-CLAYMAX200R	150	2250	3033	8534991		8681806		103101B
00002009	LO-CLAYMAX200R	150	2250	3036	8610898		8681806		103101B
00002025	LO-CLAYMAX200R	150	2250	3029	8610898		8681806		103101B
00002026	LO-CLAYMAX200R	150	2250	3020	8610898		8681806		103101B
00002027	LO-CLAYMAX200R	150	2250	3019	8610898		8681806		103101B
00002028	LO-CLAYMAX200R	150	2250	3046	8610898		8680235		103101B
00002029	LO-CLAYMAX200R	150	2250	3030	8610898		8680235		103101B
00002030	LO-CLAYMAX200R	150	2250	3038	8610898		8680235		103101B
00002031	LO-CLAYMAX200R	150	2250	3032	8610898		8680235		103101B

TOTAL SQUARE FEET.....

31.500

TOTAL PAGES 1



# Section Four

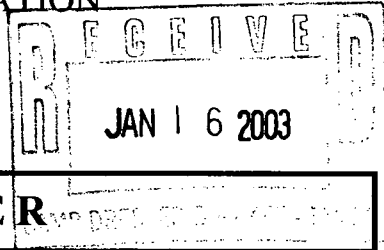


COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33637

Phone (813)988-8829 Fax (813)988-8779

[www.comanco.net](http://www.comanco.net)



**TRANSMITTAL LETTER**

Date: January 15, 2003  
Sent Via: Federal Express Priority Overnight

From: Pablo J. Rivera  
Project Manager

Sent To: Mr. Jack McHugh  
CDM  
1715 North Westshore Blvd, #875  
Tampa, Florida 33607  
Phone: (813)281-2900  
Fax: (813)288-8787

xc:

Subject: West Pasco County Landfill Expansion  
Instructions: URGENT - REVIEW IMMEDIATELY

CEC Project No. 010-848

Message:

Dear Mr. McHugh,

Enclosed please find copies of the MQC Roll Certificates for the 60 mil liner rolls you mentioned.

Please let me know if you need anything else.

Best regards,

-Pablo

**SAFETY**

Landfill Construction and Closures  
Golf Courses and Decorative Ponds  
Primary and Secondary Containments  
Theme Park Waterproofing Systems  
Vertical Barrier Systems  
Fabricated HDPE Products

**QUALITY**

Gypsum Stack Construction and Expansions  
Geomembrane and Geotextile Installation  
Geosynthetic Products and Services  
HDPE Pipe and Fittings  
HDPE Concrete Embedment Products  
Drainage Nets and Geocomposites

**SERVICE**

Concrete Construction  
Concrete Protective Liners  
Temporary Containment  
Chemical and Petrochemical  
Building Construction  
Geogrid Reinforcements



Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111313

## ROLL IDENTIFICATION

Roll Number 104111313  
 Product Name HDT060A000  
 Production Date 11/17/01

## RESIN INFORMATION

Lot Number 8211216  
 Type K306  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,848 pounds  
 1,745 kilograms

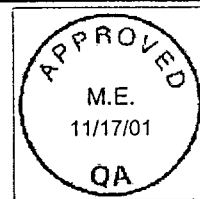
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	149	( 260 )
- MD		every roll	130	( 228 )	148	( 260 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	159	( 278 )
- MD		every roll	90	( 158 )	204	( 357 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		412	
- MD	(51 mm)	every roll	150		550	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111314

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104111314
Product Name	HDT060A000
Production Date	11/17/01

Lot Number	8211216
Type	K306
Supplier	Phillips

## GSE RESIN TEST DATA

Length $\pm$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,912 1,774	pounds kilograms

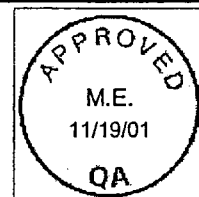
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	146	( 255 )
- MD		every roll	130	( 228 )	147	( 257 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 262 )
- MD		every roll	90	( 158 )	198	( 346 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		471	
- MD	(51 mm)	every roll	150		526	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	95	( 421 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111315

## ROLL IDENTIFICATION

Roll Number 104111315  
 Product Name HDT060A000  
 Production Date 11/17/01

## RESIN INFORMATION

Lot Number 8211216  
 Type K306  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,853 pounds  
 1,748 kilograms

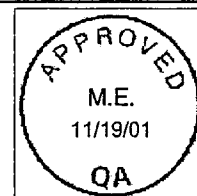
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	155	( 271 )
- MD		every roll	130	( 228 )	146	( 256 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 284 )
- MD		every roll	90	( 158 )	189	( 330 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		472	
- MD	(51 mm)	every roll	150		551	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	95	( 421 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		25	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111316

## ROLL IDENTIFICATION

Roll Number 104111316  
 Product Name HDT060A000  
 Production Date 11/17/01

## RESIN INFORMATION

Lot Number 8211216  
 Type K306  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,842 pounds  
 1,743 kilograms

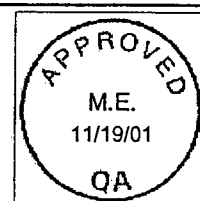
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	157	( 274 )
- MD		every roll	130	( 228 )	154	( 269 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	170	( 297 )
- MD		every roll	90	( 158 )	188	( 329 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		458	
- MD	(51 mm)	every roll	150		495	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	95	( 421 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111317

## ROLL IDENTIFICATION

Roll Number 104111317  
 Product Name HDT060A000  
 Production Date 11/17/01

## RESIN INFORMATION

Lot Number 8211216  
 Type K306  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,870 pounds  
 1,755 kilograms

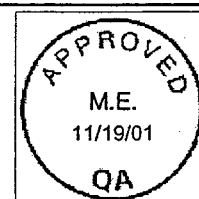
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	153	( 267 )
- MD		every roll	130	( 228 )	147	( 257 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	172	( 300 )
- MD		every roll	90	( 158 )	202	( 354 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		495	
- MD	(51 mm)	every roll	150		566	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 250 )
- MD		every roll	42	( 187 )	56	( 247 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 652 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	95	( 421 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		26	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104111318

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104111318
Product Name	HDT060A000
Production Date	11/17/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,854 pounds 1,748 kilograms

Lot Number	8211216
Type	K306
Supplier	Phillips

## GSE RESIN TEST DATA

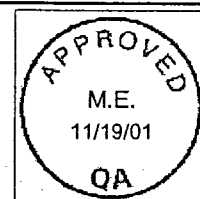
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	152	( 266 )
- MD		every roll	130	( 228 )	150	( 262 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	165	( 289 )
- MD		every roll	90	( 158 )	180	( 315 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		353	
- MD	(51 mm)	every roll	150		503	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 252 )
- MD		every roll	42	( 187 )	53	( 237 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	136	( 605 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	95	( 421 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev - - 07/00



# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

Job: 06104-28936-

To: Handex of Florida, Inc.  
2306 Gravel Drive

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

5 print(s) each of the following Submittal: D-02776-012-A (QA/QC Roll Certificates: 60 mil HDPE  
Textured Liner (Set 1 of 4))


which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments: \_\_\_\_\_

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\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh



# SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Powell</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: \_\_\_\_\_

Date: 11-15-01Submittal Identifier: D-02776-012-A

Original Submittal

Supplement

Submitted: November 15, 2001No. of Copies: 8

Resubmittal

Information Only

Submittal Description: QA/QC Roll Certificates: 60 mil HDPE Textured Liner (Set 1 of 4) (52 rolls)Specification Identifier: 01300, 02776 Section 1.03A.1(d)Manufacturer: GSE Lining Technologies, Inc.Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

Code 1 - Approved

Code 4 - Approved As Noted, Resubmit

Code 2 - Approved As Noted

Code 5 - Not Approved

Code 3 - Approved As Noted, Confirm

Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b> Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments <input type="checkbox"/> Attached <input type="checkbox"/>	<b>RESPONSE REQUIRED OF CONTRACTOR</b> Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.</p> <p>By <u>AMS</u> Date <u>12/2/01</u></p>	



# Roll Test Data Report

Lining Technology, Inc.

Roll No. 103109590

## ROLL IDENTIFICATION

Roll Number	103109590	
Product Name	HDT060A000	
Production Date	3/17/01	
Length $\approx (+/- 1\%)$	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,971 pounds 1,801 kilograms	

## RESIN INFORMATION

Lot Number	8210181
Type	K306
Supplier	Phillips

## GSE RESIN TEST DATA

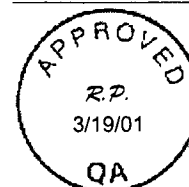
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	179	( 313 )
- MD		every roll	130	( 228 )	185	( 324 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	189	( 330 )
- MD		every roll	90	( 158 )	225	( 394 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		497	
- MD	(51 mm)	every roll	150		547	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	49	( 218 )
- MD		every roll	42	( 187 )	47	( 209 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109593

## ROLL IDENTIFICATION

Roll Number 103109593  
 Product Name HDT060A000  
 Production Date 3/17/01

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,019 pounds  
 1,823 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	187	( 328 )
- MD		every roll	130	( 228 )	178	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	184	( 322 )
- MD		every roll	90	( 158 )	137	( 239 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		14	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		414	
- MD	(51 mm)	every roll	150		380	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		21	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109600

## ROLL IDENTIFICATION

Roll Number 103109600  
 Product Name HDT060A000  
 Production Date 3/18/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,017 pounds  
 1,822 kilograms

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	181	( 316 )
- MD		every roll	130	( 228 )	174	( 304 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	190	( 333 )
- MD		every roll	90	( 158 )	221	( 387 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		513
- MD	(51 mm)	every roll		150		557
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	63	( 280 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	112	( 498 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109601

## ROLL IDENTIFICATION

Roll Number	103109601	
Product Name	HDT060A000	
Production Date	3/18/01	
Length $\approx (+/- 1\%)$	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,952 pounds 1,793 kilograms	

## RESIN INFORMATION

Lot Number	8210138
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	179	( 312 )
- MD		every roll	130	( 228 )	189	( 331 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	202	( 354 )
- MD		every roll	90	( 158 )	208	( 363 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		478	
- MD	(51 mm)	every roll	150		530	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	65	( 289 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	174	( 774 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th.	80	( 356 )	112	( 498 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109602

## ROLL IDENTIFICATION

Roll Number 103109602  
 Product Name HDT060A000  
 Production Date 3/18/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,978 pounds  
 1,804 kilograms

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

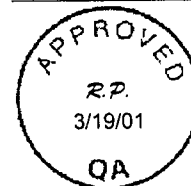
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	65	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	191	( 335 )
- MD		every roll	130	( 228 )	186	( 326 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	172	( 301 )
- MD		every roll	90	( 158 )	231	( 404 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		500	
- MD	(51 mm)	every roll	150		579	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	172	( 765 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	112	( 498 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109603

## ROLL IDENTIFICATION

Roll Number 103109603  
 Product Name HDT060A000  
 Production Date 3/18/01

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,038 pounds  
 1,832 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	187	( 327 )
- MD		every roll	130	( 228 )	191	( 335 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	212	( 371 )
- MD		every roll	90	( 158 )	239	( 419 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		554
- MD	(51 mm)	every roll		150		596
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	63	( 280 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	169	( 752 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	112	( 498 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		15

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109604

## ROLL IDENTIFICATION

Roll Number 103109604  
 Product Name HDT060A000  
 Production Date 3/18/01

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,068 pounds  
 1,845 kilograms

## GSE RESIN TEST DATA

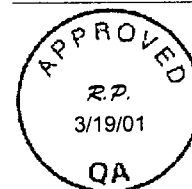
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	65	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	194	( 339 )
- MD		every roll	90	( 158 )	216	( 377 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		541	
- MD	(51 mm)	every roll	150		548	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	92	( 409 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109605

## ROLL IDENTIFICATION

Roll Number	103109605
Product Name	HDT060A000
Production Date	3/18/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	4,047 pounds 1,836 kilograms

## RESIN INFORMATION

Lot Number	8210138
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 304 )
- MD		every roll	130	( 228 )	178	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	199	( 348 )
- MD		every roll	90	( 158 )	149	( 261 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		14	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		542	
- MD	(51 mm)	every roll	150		322	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	92	( 409 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109606

## ROLL IDENTIFICATION

Roll Number	103109606	
Product Name	HDT060A000	
Production Date	3/19/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	4,012 pounds 1,820 kilograms	

## RESIN INFORMATION

Lot Number	8210138
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	179	( 314 )
- MD		every roll	130	( 228 )	172	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 284 )
- MD		every roll	90	( 158 )	182	( 318 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		417	
- MD	(51 mm)	every roll	150		491	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	92	( 409 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945*	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109608

## ROLL IDENTIFICATION

Roll Number	103109608	
Product Name	HDT060A000	
Production Date	3/19/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

## RESIN INFORMATION

Lot Number	8210138
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	65	( 1.7 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 300 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	174	( 305 )
- MD		every roll	90	( 158 )	188	( 329 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		377	
- MD	(51 mm)	every roll	150		474	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	92	( 409 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		27	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 103109609

## ROLL IDENTIFICATION

Roll Number 103109609  
Product Name HDT060A000  
Production Date 3/19/01

Length  $\approx$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 4,004 pounds  
1,816 kilograms

## RESIN INFORMATION

Lot Number 8210138  
Type TR400GS  
Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	65	( 1.7 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	188	( 328 )
- MD		every roll	130	( 228 )	186	( 325 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	185	( 324 )
- MD		every roll	90	( 158 )	173	( 302 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		482	
- MD	(51 mm)	every roll	150		506	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	82	( 365 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109610

## ROLL IDENTIFICATION

Roll Number 103109610  
 Product Name HDT060A000  
 Production Date 3/19/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,060 pounds  
 1,842 kilograms

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 308 )
- MD		every roll	130	( 228 )	168	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	151	( 263 )
- MD		every roll	90	( 158 )	184	( 323 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		370	
- MD	(51 mm)	every roll	150		502	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	82	( 365 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		23	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 103109611

## ROLL IDENTIFICATION

Roll Number 103109611  
 Product Name HDT060A000  
 Production Date 3/19/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,073 pounds  
 1,848 kilograms

## RESIN INFORMATION

Lot Number 8210138  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.09

Physical Property	Test Method	Test Frequency	Customer Minimum		Test Results	
			English	Metric	English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	65	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	190	( 333 )
- MD		every roll	130	( 228 )	181	( 316 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	194	( 340 )
- MD		every roll	90	( 158 )	185	( 324 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		508	
- MD	(51 mm)	every roll	150		471	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	65	( 289 )
- MD		every roll	42	( 187 )	65	( 289 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	82	( 365 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108345

## ROLL IDENTIFICATION

Roll Number 104108345  
 Product Name HDT060A000  
 Production Date 4/10/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,920 pounds  
 1,778 kilograms

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	60	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 308 )
- MD		every roll	130	( 228 )	179	( 314 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	145	( 253 )
- MD		every roll	90	( 158 )	164	( 287 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		470	
- MD	(51 mm)	every roll	150		450	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108346

## ROLL IDENTIFICATION

<b>Roll Number</b>	104108346	
<b>Product Name</b>	HDT060A000	
<b>Production Date</b>	4/10/01	
<b>Length</b> $\approx (+/- 1\%)$	520 feet 158 meters	
<b>Width</b> (Nominal)	22.5 feet 6.9 meters	
<b>Sheet Area</b>	11,700 sq. feet 1,086 sq. meters	
<b>Weight</b>	3,953 pounds 1,793 kilograms	

## RESIN INFORMATION

<b>Lot Number</b>	8210142
<b>Type</b>	TR400GS
<b>Supplier</b>	Phillips

## GSE RESIN TEST DATA

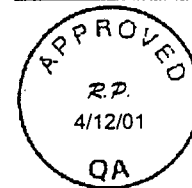
<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	185	( 323 )
- MD		every roll	130	( 228 )	185	( 323 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	195	( 342 )
- MD		every roll	90	( 158 )	175	( 307 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		530	
- MD	(51 mm)	every roll	150		490	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108347

## ROLL IDENTIFICATION

Roll Number 104108347  
 Product Name HDT060A000  
 Production Date 4/10/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

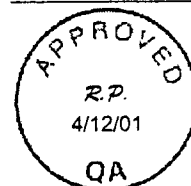
Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,978 pounds  
 1,804 kilograms

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 308 )
- MD		every roll	130	( 228 )	180	( 315 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	143	( 251 )
- MD		every roll	90	( 158 )	194	( 340 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		400	
- MD	(51 mm)	every roll	150		400	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108348

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108348
Product Name	HDT060A000
Production Date	4/11/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	4,011 pounds 1,819 kilograms

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	61	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 287 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	182	( 318 )
- MD		every roll	90	( 158 )	238	( 417 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		528	
- MD	(51 mm)	every roll	150		604	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	162	( 721 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108349

## ROLL IDENTIFICATION

Roll Number	104108349	
Product Name	HDT060A000	
Production Date	4/11/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,974	pounds
	1,803	kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

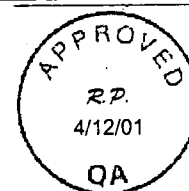
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 304 )
- MD		every roll	130	( 228 )	168	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	196	( 343 )
- MD		every roll	90	( 158 )	230	( 403 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		572	
- MD	(51 mm)	every roll	150		572	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108351

## ROLL IDENTIFICATION

Roll Number	104108351
Product Name	HDT060A000
Production Date	4/11/01
Length $\pm$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,849 pounds 1,746 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	154	( 270 )
- MD		every roll	130	( 228 )	157	( 275 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	233	( 407 )
- MD		every roll	90	( 158 )	230	( 402 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		668	
- MD	(51 mm)	every roll	150		631	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108352

## ROLL IDENTIFICATION

Roll Number 104108352  
 Product Name HDT060A000  
 Production Date 4/11/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,952 pounds  
 1,793 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	161	( 281 )
- MD		every roll	130	( 228 )	164	( 287 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	158	( 277 )
- MD		every roll	90	( 158 )	155	( 271 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		617	
- MD	(51 mm)	every roll	150		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	49	( 218 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108353

## ROLL IDENTIFICATION

Roll Number 104108353  
 Product Name HDT060A000  
 Production Date 4/11/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,944 pounds  
 1,789 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum		Test Results	
			English	Metric	English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	60	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	155	( 270 )
- MD		every roll	130	( 228 )	157	( 275 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	193	( 338 )
- MD		every roll	90	( 158 )	218	( 382 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		586	
- MD	(51 mm)	every roll	150		613	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	70	( 312 )
- MD		every roll	42	( 187 )	48	( 214 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		24	

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 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108354

## ROLL IDENTIFICATION

Roll Number	104108354
Product Name	HDT060A000
Production Date	4/11/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,920 pounds 1,778 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	152	( 266 )
- MD		every roll	130	( 228 )	144	( 253 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	143	( 251 )
- MD		every roll	90	( 158 )	174	( 305 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		595	
- MD	(51 mm)	every roll	150		686	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	47	( 209 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		20	
Average (mils)						

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Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108355

## ROLL IDENTIFICATION

Roll Number 104108355  
 Product Name HDT060A000  
 Production Date 4/11/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,885 pounds  
 1,762 kilograms

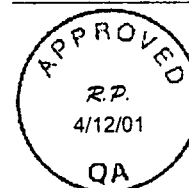
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 305 )
- MD		every roll	130	( 228 )	173	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	130	( 228 )
- MD		every roll	90	( 158 )	141	( 246 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		400	
- MD	(51 mm)	every roll	150		520	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108356

## ROLL IDENTIFICATION

Roll Number	104108356	
Product Name	HDT060A000	
Production Date	4/11/01	
Length $\approx (+/- 1\%)$	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,916 1,776	pounds kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 308 )
- MD		every roll	130	( 228 )	173	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	125	( 218 )
- MD		every roll	90	( 158 )	142	( 248 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		370	
- MD	(51 mm)	every roll	150		520	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108358

## ROLL IDENTIFICATION

Roll Number	104108358	
Product Name	HDT060A000	
Production Date	4/11/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,901 pounds 1,769 kilograms	

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

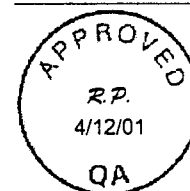
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 297 )
- MD		every roll	130	( 228 )	175	( 307 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	198	( 346 )
- MD		every roll	90	( 158 )	178	( 311 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		550	
- MD	(51 mm)	every roll	150		500	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		14	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108359

## ROLL IDENTIFICATION

Roll Number	104108359	
Product Name	HDT060A000	
Production Date	4/11/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,915 pounds 1,776 kilograms	

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

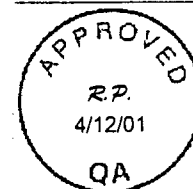
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	60	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	180	( 315 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	166	( 290 )
- MD		every roll	90	( 158 )	153	( 267 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		350	
- MD	(51 mm)	every roll	150		400	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108360

## ROLL IDENTIFICATION

Roll Number	104108360	
Product Name	HDT060A000	
Production Date	4/11/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,911 1,774	pounds kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

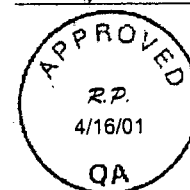
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	172	( 301 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	134	( 234 )
- MD		every roll	90	( 158 )	130	( 227 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		530	
- MD	(51 mm)	every roll	150		330	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		19	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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### ROLL IDENTIFICATION

<i>Roll Number</i>	104108363	
<i>Product Name</i>	HDT060A000	
<i>Production Date</i>	4/12/01	
<hr/>		
<i>Length</i> $\approx (+/- 1\%)$	520	feet
	158	meters
<i>Width</i> ( <i>Nominal</i> )	22.5	feet
	6.9	meters
<i>Sheet Area</i>	11,700	sq. feet
	1,086	sq. meters
<i>Weight</i>	3,977	pounds
	1,804	kilograms

## RESIN INFORMATION

<i>Lot Number</i>	8210142
<i>Type</i>	TR400GS
<i>Supplier</i>	Phillips

### GSE RESIN TEST DATA

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

<i>Physical Property</i>	<i>Test Method</i>	<i>Test Frequency</i>	<i>Customer English</i>	<i>Minimum Metric</i>	<i>Test Results English</i>	<i>Test Results Metric</i>
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 302 )
- MD		every roll	130	( 228 )	162	( 284 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	202	( 354 )
- MD		every roll	90	( 158 )	220	( 385 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		615	
- MD	(51 mm)	every roll	150		611	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

<i>Order No.</i>	20979
<i>Customer Name</i>	PASCO COUNTY LANDFILL
<i>Location</i>	DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108364

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108364
Product Name	HDT060A000
Production Date	4/12/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,848 pounds 1,745 kilograms

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

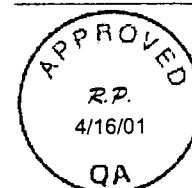
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	161	( 282 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	209	( 365 )
- MD		every roll	90	( 158 )	241	( 421 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		585	
- MD	(51 mm)	every roll	150		640	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108366

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108366
Product Name	HDT060A000
Production Date	4/12/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,911 pounds 1,774 kilograms

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

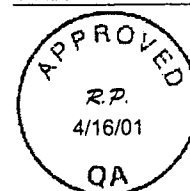
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 302 )
- MD		every roll	130	( 228 )	154	( 270 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	228	( 400 )
- MD		every roll	90	( 158 )	238	( 416 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		616	
- MD	(51 mm)	every roll	150		635	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 104108368

## ROLL IDENTIFICATION

Roll Number 104108368  
Product Name HDT060A000  
Production Date 4/12/01

Length  $\approx$  (+/- 1%) 520 feet  
158 meters

Width (Nominal) 22.5 feet  
6.9 meters

Sheet Area 11,700 sq. feet  
1,086 sq. meters

Weight 3,913 pounds  
1,775 kilograms

## RESIN INFORMATION

Lot Number 8210142  
Type TR400GS  
Supplier Phillips

## GSE RESIN TEST DATA

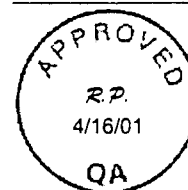
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 300 )
- MD		every roll	130	( 228 )	167	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	134	( 234 )
- MD		every roll	90	( 158 )	136	( 238 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		470	
- MD	(51 mm)	every roll	150		494	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108369

## ROLL IDENTIFICATION

## RESIN INFORMATION

**Roll Number** 104108369  
**Product Name** HDT060A000  
**Production Date** 4/14/01  
**Length**  $\approx (+/- 1\%)$  520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,914 pounds  
1,775 kilograms

**Lot Number** 8210142  
**Type** TR400GS  
**Supplier** Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 280 )
- MD		every roll	130	( 228 )	163	( 286 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	164	( 287 )
- MD		every roll	90	( 158 )	219	( 384 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		22	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		429	
- MD	(51 mm)	every roll	150		600	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108370

## ROLL IDENTIFICATION

Roll Number 104108370  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters

Width (Nominal) 22.5 feet  
 6.9 meters

Sheet Area 11,700 sq. feet  
 1,086 sq. meters

Weight 3,954 pounds  
 1,794 kilograms

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 284 )
- MD		every roll	130	( 228 )	163	( 285 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	184	( 322 )
- MD		every roll	90	( 158 )	180	( 316 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		678	
- MD	(51 mm)	every roll	150		662	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		18	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108371

## ROLL IDENTIFICATION

Roll Number	104108371	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,934 1,784	pounds kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

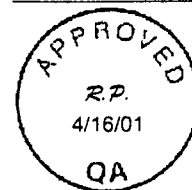
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	168	( 293 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	172	( 302 )
- MD		every roll	90	( 158 )	175	( 307 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		600	
- MD	(51 mm)	every roll	150		658	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108372

## ROLL IDENTIFICATION

Roll Number	104108372
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,937 pounds 1,786 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

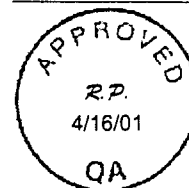
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 285 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	175	( 307 )
- MD		every roll	90	( 158 )	166	( 290 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		642	
- MD	(51 mm)	every roll	150		609	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	163	( 725 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		17	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108373

## ROLL IDENTIFICATION

Roll Number	104108373	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\pm (+/- 1\%)$	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,932	pounds
	1,784	kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 283 )
- MD		every roll	130	( 228 )	165	( 289 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	176	( 309 )
- MD		every roll	90	( 158 )	173	( 302 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		664	
- MD	(51 mm)	every roll	150		641	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108374

## ROLL IDENTIFICATION

Roll Number 104108374  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,924 pounds  
 1,780 kilograms

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

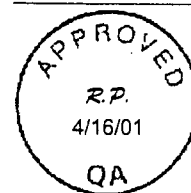
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	153	( 268 )
- MD		every roll	130	( 228 )	162	( 283 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	176	( 308 )
- MD		every roll	90	( 158 )	160	( 281 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		677	
- MD	(51 mm)	every roll	150		620	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	163	( 725 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		19	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108375

## ROLL IDENTIFICATION

<b>Roll Number</b>	104108375	
<b>Product Name</b>	HDT060A000	
<b>Production Date</b>	4/14/01	
<b>Length</b> $\approx$ (+/- 1%)	520	feet
	158	meters
<b>Width</b> (Nominal)	22.5	feet
	6.9	meters
<b>Sheet Area</b>	11,700	sq. feet
	1,086	sq. meters
<b>Weight</b>	3,920	pounds
	1,778	kilograms

## RESIN INFORMATION

<b>Lot Number</b>	8210142
<b>Type</b>	TR400GS
<b>Supplier</b>	Phillips

## GSE RESIN TEST DATA

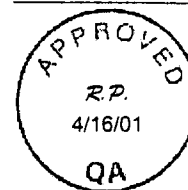
<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 293 )
- MD		every roll	130	( 228 )	155	( 271 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	179	( 312 )
- MD		every roll	90	( 158 )	173	( 303 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		670	
- MD	(51 mm)	every roll	150		667	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		23	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108376

## ROLL IDENTIFICATION

Roll Number 104108376  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,892 pounds  
 1,765 kilograms

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

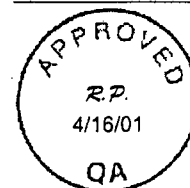
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	161	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	203	( 355 )
- MD		every roll	90	( 158 )	232	( 406 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		587	
- MD	(51 mm)	every roll	150		607	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108377

## ROLL IDENTIFICATION

Roll Number	104108377	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,878 pounds 1,759 kilograms	

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 292 )
- MD		every roll	130	( 228 )	166	( 290 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	219	( 383 )
- MD		every roll	90	( 158 )	225	( 393 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		598	
- MD	(51 mm)	every roll	150		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108378

## ROLL IDENTIFICATION

Roll Number	104108378	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,830 pounds 1,737 kilograms	

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

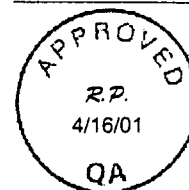
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 280 )
- MD		every roll	130	( 228 )	157	( 276 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	197	( 344 )
- MD		every roll	90	( 158 )	241	( 422 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		579	
- MD	(51 mm)	every roll	150		654	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108379

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108379
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,790 pounds 1,719 kilograms

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 299 )
- MD		every roll	130	( 228 )	165	( 288 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	206	( 360 )
- MD		every roll	90	( 158 )	203	( 356 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		581	
- MD	(51 mm)	every roll	150		579	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion*	ASTM D 5596	every 5th	9		10	
Views in Cat1 - Cat2						
Asperity Height	GRI GM 12	every roll	10		24	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108380

## ROLL IDENTIFICATION

Roll Number	104108380	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,842 1,743	pounds kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

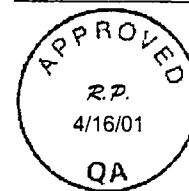
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 284 )
- MD		every roll	130	( 228 )	162	( 284 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	206	( 361 )
- MD		every roll	90	( 158 )	215	( 377 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		590	
- MD	(51 mm)	every roll	150		578	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108382

## ROLL IDENTIFICATION

Roll Number	104108382	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,925 1,780	pounds kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

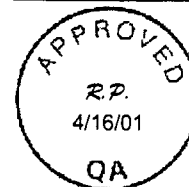
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 293 )
- MD		every roll	130	( 228 )	159	( 278 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	220	( 385 )
- MD		every roll	90	( 158 )	257	( 450 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		625	
- MD	(51 mm)	every roll	150		654	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108383

## ROLL IDENTIFICATION

Roll Number	104108383	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,894	pounds
	1,766	kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 286 )
- MD		every roll	130	( 228 )	165	( 289 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	233	( 407 )
- MD		every roll	90	( 158 )	247	( 432 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		636	
- MD	(51 mm)	every roll	150		635	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108384

## ROLL IDENTIFICATION

Roll Number	104108384
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,856 pounds 1,749 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

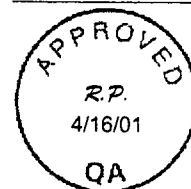
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	164	( 288 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	238	( 416 )
- MD		every roll	90	( 158 )	267	( 466 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		647	
- MD	(51 mm)	every roll	150		674	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108385

## ROLL IDENTIFICATION

Roll Number	104108385
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,920 pounds 1,778 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 288 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	242	( 424 )
- MD		every roll	90	( 158 )	232	( 405 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		618	
- MD	(51 mm)	every roll	150		609	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108386

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 104108386  
 Product Name HDT060A000  
 Production Date 4/14/01

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,880 pounds  
 1,760 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	170	( 298 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	259	( 453 )
- MD		every roll	90	( 158 )	242	( 424 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		673	
- MD	(51 mm)	every roll	150		620	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		20	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00



**ROLL IDENTIFICATION****RESIN INFORMATION**

**Roll Number** 104108387  
**Product Name** HDT060A000  
**Production Date** 4/14/01  
**Length**  $\approx$ (+/- 1%) 520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,888 pounds  
1,764 kilograms

**Lot Number** 8210142  
**Type** TR400GS  
**Supplier** Phillips

**GSE RESIN TEST DATA**

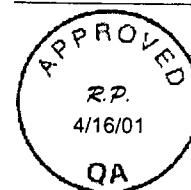
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	170	( 298 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	237	( 415 )
- MD		every roll	90	( 158 )	235	( 411 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		609	
- MD	(51 mm)	every roll	150		614	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108388

## ROLL IDENTIFICATION

Roll Number 104108388  
 Product Name HDT060A000  
 Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

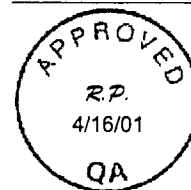
Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,880 pounds  
 1,760 kilograms

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 281 )
- MD		every roll	130	( 228 )	169	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	239	( 418 )
- MD		every roll	90	( 158 )	244	( 427 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		622	
- MD	(51 mm)	every roll	150		625	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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*Linix Technology, Inc.*

# Roll Test Data Report

Roll No. 104108389

## ROLL IDENTIFICATION

Roll Number	104108389
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,787 pounds 1,718 kilograms

## RESIN INFORMATION

Lot Number	8210142
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

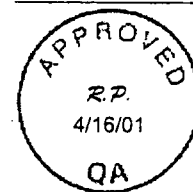
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 301 )
- MD		every roll	130	( 228 )	168	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	257	( 450 )
- MD		every roll	90	( 158 )	243	( 426 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		651	
- MD	(51 mm)	every roll	150		612	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108390

## ROLL IDENTIFICATION

Roll Number 104108390  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,841 pounds  
 1,742 kilograms

## RESIN INFORMATION

Lot Number 8210142  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

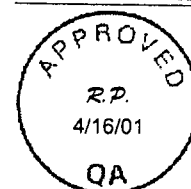
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	249	( 436 )
- MD		every roll	90	( 158 )	254	( 445 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		642	
- MD	(51 mm)	every roll	150		634	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 16, 2001

PSN# 4137-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210138
P.O. Number:	
Date Shipped:	02/16/01
Package:	PSPX 6808
Quantity:	185100 LBS.
Melt Index, ASTM D1238:	.090 G/10 MIN
HLMI Flow Rate, ASTM D1238:	10.3 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	114.
Production Date:	02/08/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	134.000

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 23, 2001

PSN# 4860-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210142
P.O. Number:	
Date Shipped:	02/23/01
Package:	PSPX 6639
Quantity:	184950 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate, ASTM D1238:	11.9 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	149.
Production Date:	02/09/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	110.250

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 27, 2001

PSN# 5206-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlèx\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	K306
Lot Number:	8210181
P.O. Number:	
Date Shipped:	02/27/01
Package:	PSPX 6610
Quantity:	184200 LBS.
HLMI Flow Rate, ASTM D1238:	10.2 G/10 MIN
Density, ASTM D1505:	.937 G/CC

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



# TRANSMITTAL SHEET

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

consulting, engineering,  
construction, operations

# CDM

Date: 12/5/01

Job: 06104-28936-

To: Handex of Florida, Inc.

2306 Gravel Drive

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

6 print(s) each of the following Submittal: D-02776-013-A (QA/QC Roll Certificates: 60 mil Textured  
Liner ( Set 2 of 4))

which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments:

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By

  
Abdul Mulla-Saleh

## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner: <u>Pasco County B.O.C.C.</u>	Project No. <u>01-063</u>	Project Manager: <u>John Powell</u>
Engineer: <u>Camp Dresser &amp; McKee</u>	Project No. <u>6104-28936</u>	Project Manager: <u>Daniel Strobbridge, Q.E.P.</u>
Contractor: <u>Handex of Florida, Inc.</u>	Project No. <u>123477</u>	Project Manager: <u>Gary L. Conaway, P.E.</u>
Subcontractor: <u>COMANCO Environmental Corp.</u>	Project No. <u>010-848</u>	Project Manager: <u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-15-01Submittal Identifier: D-02776-013-A☒ Original Submittal☐ SupplementSubmitted: November 15, 2001No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: QA/QC Roll Certificates: 60 mil HDPE Textured Liner (Set 2 of 4) (52 rolls)Specification Identifier: 01300, 02776 Section 1.03A.1(d)Manufacturer: GSE Lining Technologies, Inc.Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

## SHOP DRAWING REVIEW

ENGINEER'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

By AMSDate 12/3/01



Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108391

## ROLL IDENTIFICATION

Roll Number	104108391
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,878 pounds 1,759 kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

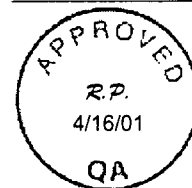
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	160	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	177	( 310 )
- MD		every roll	90	( 158 )	201	( 352 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		19	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		500	
- MD	(51 mm)	every roll	150		527	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108392

## ROLL IDENTIFICATION

Roll Number	104108392
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,934 pounds 1,784 kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	153	( 268 )
- MD		every roll	130	( 228 )	156	( 273 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	190	( 332 )
- MD		every roll	90	( 158 )	209	( 365 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		578
- MD	(51 mm)	every roll		150		581
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	48	( 214 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		21

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108395

## ROLL IDENTIFICATION

Roll Number	104108395	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,900 pounds 1,769 kilograms	

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

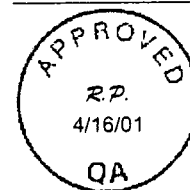
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 290 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 283 )
- MD		every roll	90	( 158 )	233	( 408 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		519	
- MD	(51 mm)	every roll	150		636	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

# Roll Test Data Report

Roll No. 104108396

## ROLL IDENTIFICATION

Roll Number 104108396  
Product Name HDT060A000  
Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210163  
Type TR400GS  
Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

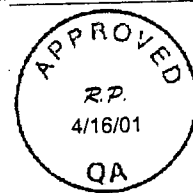
Length  $\approx$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,872 pounds  
1,756 kilograms

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 287 )
- MD		every roll	130	( 228 )	156	( 273 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	174	( 305 )
- MD		every roll	90	( 158 )	185	( 324 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		510
- MD	(51 mm)	every roll		150		523
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108399

## ROLL IDENTIFICATION

Roll Number	104108399	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx (+/- 1\%)$	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,912 pounds 1,774 kilograms	

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	179	( 314 )
- MD		every roll	130	( 228 )	182	( 318 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	190	( 332 )
- MD		every roll	90	( 158 )	144	( 252 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		530	
- MD	(51 mm)	every roll	150		440	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108400

## ROLL IDENTIFICATION

Roll Number	104108400	
Product Name	HDT060A000	
Production Date	4/15/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,888	pounds
	1,764	kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

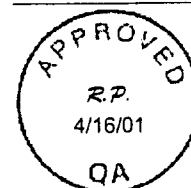
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	201	( 351 )
- MD		every roll	90	( 158 )	179	( 314 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		560	
- MD	(51 mm)	every roll	150		530	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108401

## ROLL IDENTIFICATION

Roll Number 104108401  
 Product Name HDT060A000  
 Production Date 4/15/01

## RESIN INFORMATION

Lot Number 8210163  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,947 pounds  
 1,790 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	182	( 319 )
- MD		every roll	130	( 228 )	173	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	140	( 245 )
- MD		every roll	90	( 158 )	181	( 316 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13			16
- MD	(33 mm)	every roll	13			17
Break Elongation, % - TD	gauge length = 2.0"	every roll	150			327
- MD	(51 mm)	every roll	150			540
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	143	( 636 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940			0.946
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0			2.6
Carbon Black Dispersion	ASTM D 3015	every 5th	A2			A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9			10
Asperity Height Average (mils)	GRI GM 12	every roll	10			18

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108402

## ROLL IDENTIFICATION

Roll Number	104108402	
Product Name	HDT060A000	
Production Date	4/15/01	
Length $\pm$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,943 1,789	pounds kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

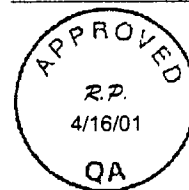
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	182	( 319 )
- MD		every roll	130	( 228 )	183	( 321 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	141	( 246 )
- MD		every roll	90	( 158 )	173	( 302 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		350	
- MD	(51 mm)	every roll	150		460	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108403

## ROLL IDENTIFICATION

Roll Number 104108403  
 Product Name HDT060A000  
 Production Date 4/15/01

## RESIN INFORMATION

Lot Number 8210163  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,896 pounds  
 1,767 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 301 )
- MD		every roll	130	( 228 )	173	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 262 )
- MD		every roll	90	( 158 )	173	( 302 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		470	
- MD	(51 mm)	every roll	150		500	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108404

## ROLL IDENTIFICATION

Roll Number 104108404  
 Product Name HDT060A000  
 Production Date 4/15/01

## RESIN INFORMATION

Lot Number 8210163  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

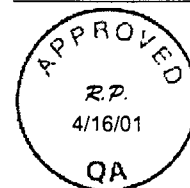
Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,825 pounds  
 1,735 kilograms

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	60	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 284 )
- MD		every roll	130	( 228 )	155	( 271 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	188	( 328 )
- MD		every roll	90	( 158 )	224	( 393 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		575	
- MD	(51 mm)	every roll	150		623	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	64	( 285 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108405

## ROLL IDENTIFICATION

Roll Number	104108405	
Product Name	HDT060A000	
Production Date	4/15/01	
Length $\approx (+/- 1\%)$	500	feet
	152	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,250	sq. feet
	1,045	sq. meters
Weight	3,765	pounds
	1,708	kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

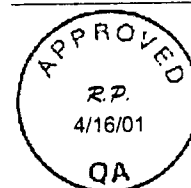
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	158	( 276 )
- MD		every roll	130	( 228 )	156	( 272 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	194	( 339 )
- MD		every roll	90	( 158 )	240	( 420 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		575
- MD	(51 mm)	every roll		150		648
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	48	( 214 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108407

## ROLL IDENTIFICATION

Roll Number	104108407	
Product Name	HDT060A000	
Production Date	4/15/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,872	pounds
	1,756	kilograms

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	159	( 279 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	202	( 353 )
- MD		every roll	90	( 158 )	218	( 382 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		591
- MD	(51 mm)	every roll		150		601
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108408

## ROLL IDENTIFICATION

Roll Number	104108408	
Product Name	HDT060A000	
Production Date	4/15/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,878 pounds 1,759 kilograms	

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

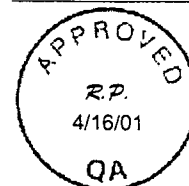
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	158	( 277 )
- MD		every roll	130	( 228 )	152	( 266 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	191	( 334 )
- MD		every roll	90	( 158 )	213	( 373 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		567	
- MD	(51 mm)	every roll	150		592	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108409

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108409
Product Name	HDT060A000
Production Date	4/15/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,894 pounds 1,766 kilograms

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

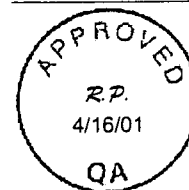
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	157	( 275 )
- MD		every roll	130	( 228 )	160	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	195	( 341 )
- MD		every roll	90	( 158 )	222	( 389 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		571	
- MD	(51 mm)	every roll	150		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108410

## ROLL IDENTIFICATION

Roll Number 104108410  
 Product Name HDT060A000  
 Production Date 4/15/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,936 pounds  
 1,785 kilograms

## RESIN INFORMATION

Lot Number 8210163  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

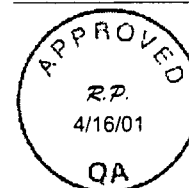
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 286 )
- MD		every roll	130	( 228 )	160	( 279 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	189	( 330 )
- MD		every roll	90	( 158 )	239	( 418 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		632	
- MD	(51 mm)	every roll	150		622	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.7	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		29	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108411

## ROLL IDENTIFICATION

Roll Number 104108411  
 Product Name HDT060A000  
 Production Date 4/15/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,850 pounds  
 1,746 kilograms

## RESIN INFORMATION

Lot Number 8210163  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

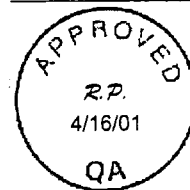
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	219	( 383 )
- MD		every roll	130	( 228 )	222	( 388 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	225	( 393 )
- MD		every roll	90	( 158 )	224	( 391 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		443
- MD	(51 mm)	every roll		150		485
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	76	( 338 )
- MD		every roll	42	( 187 )	74	( 329 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	189	( 841 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.7
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		24

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108412

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number	104108412
Product Name	HDT060A000
Production Date	4/15/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,873 pounds 1,757 kilograms

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 293 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	218	( 382 )
- MD		every roll	90	( 158 )	178	( 311 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		570	
- MD	(51 mm)	every roll	150		480	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.7	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108413

## ROLL IDENTIFICATION

Roll Number	104108413	
Product Name	HDT060A000	
Production Date	4/16/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,847 pounds 1,745 kilograms	

## RESIN INFORMATION

Lot Number	8210163
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

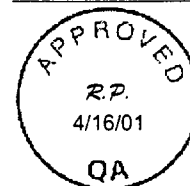
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	168	( 294 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	193	( 337 )
- MD		every roll	90	( 158 )	227	( 398 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		520	
- MD	(51 mm)	every roll	150		600	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.7	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		24	

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108416

## ROLL IDENTIFICATION

Roll Number 104108416  
 Product Name HDT060A000  
 Production Date 4/16/01

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,881 pounds  
 1,760 kilograms

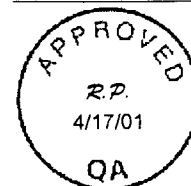
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 297 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	196	( 343 )
- MD		every roll	90	( 158 )	206	( 361 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		500	
- MD	(51 mm)	every roll	150		550	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		23	
Average (mils)						

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108417

## ROLL IDENTIFICATION

Roll Number	104108417	
Product Name	HDT060A000	
Production Date	4/16/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,911 pounds 1,774 kilograms	

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

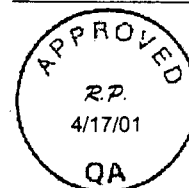
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	168	( 294 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	225	( 394 )
- MD		every roll	90	( 158 )	237	( 415 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		596	
- MD	(51 mm)	every roll	150		617	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108418

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 104108418  
 Product Name HDT060A000  
 Production Date 4/16/01

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,863 pounds  
 1,752 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 288 )
- MD		every roll	130	( 228 )	161	( 283 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	166	( 290 )
- MD		every roll	90	( 158 )	169	( 296 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		471
- MD	(51 mm)	every roll		150		553
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	47	( 209 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.6
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		23

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 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108419

## ROLL IDENTIFICATION

Roll Number	104108419	
Product Name	HDT060A000	
Production Date	4/16/01	
Length $\approx (+/- 1\%)$	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,789 1,719	pounds kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 284 )
- MD		every roll	130	( 228 )	162	( 284 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	176	( 309 )
- MD		every roll	90	( 158 )	216	( 377 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		468	
- MD	(51 mm)	every roll	150		580	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	145	( 645 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

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Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108420

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 104108420  
 Product Name HDT060A000  
 Production Date 4/16/01

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,824 pounds  
 1,735 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 288 )
- MD		every roll	130	( 228 )	160	( 280 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	177	( 309 )
- MD		every roll	90	( 158 )	211	( 369 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		519	
- MD	(51 mm)	every roll	150		578	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	110	( 490 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		25	
Average (mils)						

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 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108421

## ROLL IDENTIFICATION

Roll Number 104108421  
 Product Name HDT060A000  
 Production Date 4/16/01

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,940 pounds  
 1,787 kilograms

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

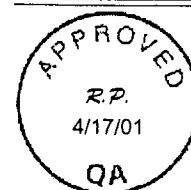
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	164	( 288 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	193	( 339 )
- MD		every roll	90	( 158 )	228	( 400 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		488	
- MD	(51 mm)	every roll	150		609	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	110	( 490 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108422

## ROLL IDENTIFICATION

Roll Number	104108422	
Product Name	HDT060A000	
Production Date	4/16/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,872 pounds 1,756 kilograms	

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

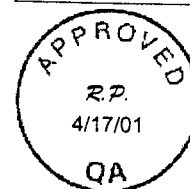
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	151	( 264 )
- MD		every roll	130	( 228 )	163	( 286 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	165	( 289 )
- MD		every roll	90	( 158 )	217	( 379 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		22	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		463	
- MD	(51 mm)	every roll	150		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	49	( 218 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	110	( 490 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108423

## ROLL IDENTIFICATION

Roll Number 104108423  
 Product Name HDT060A000  
 Production Date 4/16/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,872 pounds  
 1,756 kilograms

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

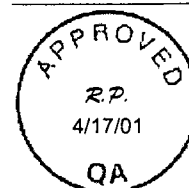
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 280 )
- MD		every roll	130	( 228 )	159	( 279 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	172	( 301 )
- MD		every roll	90	( 158 )	224	( 392 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		563	
- MD	(51 mm)	every roll	150		609	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	110	( 490 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108424

## ROLL IDENTIFICATION

Roll Number 104108424  
 Product Name HDT060A000  
 Production Date 4/16/01

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,797 pounds  
 1,722 kilograms

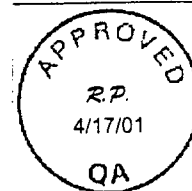
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 280 )
- MD		every roll	130	( 228 )	147	( 257 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	197	( 345 )
- MD		every roll	90	( 158 )	218	( 382 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		18
- MD	(33 mm)	every roll		13		23
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		563
- MD	(51 mm)	every roll		150		614
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	45	( 200 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	144	( 639 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	110	( 490 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.6
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108425

## ROLL IDENTIFICATION

Roll Number	104108425
Product Name	HDT060A000
Production Date	4/16/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,808 pounds 1,727 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	186	( 325 )
- MD		every roll	130	( 228 )	181	( 316 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	138	( 241 )
- MD		every roll	90	( 158 )	172	( 301 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		395	
- MD	(51 mm)	every roll	150		420	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108426

## ROLL IDENTIFICATION

Roll Number	104108426
Product Name	HDT060A000
Production Date	4/16/01
Length $\pm$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,890 pounds 1,765 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	178	( 311 )
- MD		every roll	130	( 228 )	180	( 315 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	152	( 266 )
- MD		every roll	90	( 158 )	162	( 284 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		460
- MD	(51 mm)	every roll		150		530
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		24

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Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108431

## ROLL IDENTIFICATION

Roll Number	104108431	
Product Name	HDT060A000	
Production Date	4/16/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,918	pounds
	1,777	kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

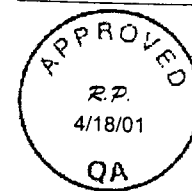
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 287 )
- MD		every roll	130	( 228 )	161	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	234	( 409 )
- MD		every roll	90	( 158 )	233	( 407 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		600	
- MD	(51 mm)	every roll	150		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

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Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108432

## ROLL IDENTIFICATION

Roll Number	104108432
Product Name	HDT060A000
Production Date	4/16/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,914 pounds 1,775 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 280 )
- MD		every roll	130	( 228 )	155	( 271 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	207	( 362 )
- MD		every roll	90	( 158 )	218	( 382 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		610	
- MD	(51 mm)	every roll	150		637	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108433

## ROLL IDENTIFICATION

Roll Number 104108433  
 Product Name HDT060A000  
 Production Date 4/17/01

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,901 pounds  
 1,769 kilograms

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	160	( 280 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	212	( 370 )
- MD		every roll	90	( 158 )	217	( 381 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		592
- MD	(51 mm)	every roll		150		592
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.6
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height Average (mils)	GRI GM 12	every roll		10		23

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 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108435

## ROLL IDENTIFICATION

Roll Number	104108435
Product Name	HDT060A000
Production Date	4/17/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,889 pounds 1,764 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

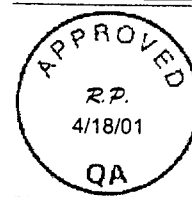
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	157	( 275 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	204	( 358 )
- MD		every roll	90	( 158 )	222	( 389 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		600	
- MD	(51 mm)	every roll	150		600	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		25	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108436

## ROLL IDENTIFICATION

Roll Number 104108436  
 Product Name HDT060A000  
 Production Date 4/17/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,851 pounds  
 1,747 kilograms

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

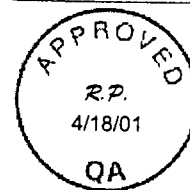
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 279 )
- MD		every roll	130	( 228 )	154	( 270 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	204	( 357 )
- MD		every roll	90	( 158 )	208	( 364 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		604	
- MD	(51 mm)	every roll	150		572	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		25	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108437

## ROLL IDENTIFICATION

Roll Number 104108437  
 Product Name HDT060A000  
 Production Date 4/17/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,904 pounds  
 1,771 kilograms

## RESIN INFORMATION

Lot Number 8210143  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

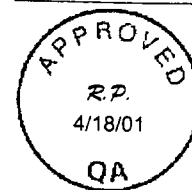
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 281 )
- MD		every roll	130	( 228 )	156	( 273 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	211	( 370 )
- MD		every roll	90	( 158 )	232	( 407 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		20	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		573	
- MD	(51 mm)	every roll	150		597	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108438

## ROLL IDENTIFICATION

Roll Number	104108438
Product Name	HDT060A000
Production Date	4/17/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,980 pounds 1,805 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	160	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	217	( 380 )
- MD		every roll	90	( 158 )	243	( 426 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		587	
- MD	(51 mm)	every roll	150		638	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108439

## ROLL IDENTIFICATION

Roll Number	104108439	
Product Name	HDT060A000	
Production Date	4/17/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,825	pounds
	1,735	kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

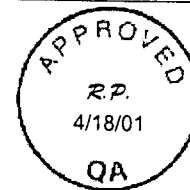
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	152	( 266 )
- MD		every roll	130	( 228 )	149	( 261 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	222	( 389 )
- MD		every roll	90	( 158 )	234	( 409 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		608	
- MD	(51 mm)	every roll	150		616	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	162	( 721 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108440

## ROLL IDENTIFICATION

## RESIN INFORMATION

**Roll Number** 104108440  
**Product Name** HDT060A000  
**Production Date** 4/17/01  
**Length**  $\approx$  (+/- 1%) 520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,867 pounds  
1,754 kilograms

**Lot Number** 8210143  
**Type** TR400GS  
**Supplier** Phillips

## GSE RESIN TEST DATA

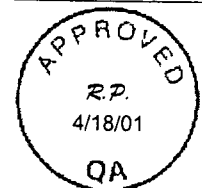
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	152	( 266 )
- MD		every roll	130	( 228 )	155	( 272 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	214	( 374 )
- MD		every roll	90	( 158 )	206	( 361 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		576	
- MD	(51 mm)	every roll	150		567	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	163	( 725 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596	every 5th	9		10	
Views in Cat1 - Cat2						
Asperity Height	GRI GM 12	every roll	10		19	
Average (mils)						

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108441

## ROLL IDENTIFICATION

Roll Number	104108441	
Product Name	HDT060A000	
Production Date	4/17/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,807 pounds 1,727 kilograms	

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	149	( 261 )
- MD		every roll	130	( 228 )	162	( 283 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	215	( 376 )
- MD		every roll	90	( 158 )	240	( 421 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		584	
- MD	(51 mm)	every roll	150		660	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108442

## ROLL IDENTIFICATION

Roll Number	104108442	
Product Name	HDT060A000	
Production Date	4/17/01	
Length $\approx (+/- 1\%)$	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,850	pounds
	1,746	kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

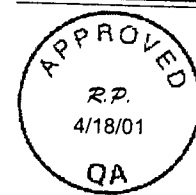
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	152	( 266 )
- MD		every roll	130	( 228 )	153	( 269 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	193	( 338 )
- MD		every roll	90	( 158 )	217	( 380 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		565	
- MD	(51 mm)	every roll	150		620	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		20	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108443

## ROLL IDENTIFICATION

<b>Roll Number</b>	104108443	
<b>Product Name</b>	HDT060A000	
<b>Production Date</b>	4/17/01	
<b>Length</b> $\approx (+/- 1\%)$	520	feet
	158	meters
<b>Width</b> (Nominal)	22.5	feet
	6.9	meters
<b>Sheet Area</b>	11,700	sq. feet
	1,086	sq. meters
<b>Weight</b>	3,854	pounds
	1,748	kilograms

## RESIN INFORMATION

<b>Lot Number</b>	8210143
<b>Type</b>	TR400GS
<b>Supplier</b>	Phillips

## GSE RESIN TEST DATA

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	158	( 276 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	216	( 378 )
- MD		every roll	90	( 158 )	209	( 365 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		611	
- MD	(51 mm)	every roll	150		565	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108444

## ROLL IDENTIFICATION

Roll Number	104108444	
Product Name	HDT060A000	
Production Date	4/17/01	
Length $\pm$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,845	pounds
	1,744	kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	155	( 271 )
- MD		every roll	130	( 228 )	152	( 265 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	216	( 378 )
- MD		every roll	90	( 158 )	192	( 336 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		635	
- MD	(51 mm)	every roll	150		553	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108446

## ROLL IDENTIFICATION

Roll Number	104108446
Product Name	HDT060A000
Production Date	4/17/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,815 pounds 1,730 kilograms

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

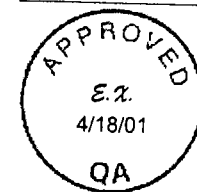
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	149	( 261 )
- MD		every roll	130	( 228 )	153	( 267 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	210	( 367 )
- MD		every roll	90	( 158 )	209	( 365 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		605	
- MD	(51 mm)	every roll	150		599	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108447

## ROLL IDENTIFICATION

## RESIN INFORMATION

**Roll Number** 104108447  
**Product Name** HDT060A000  
**Production Date** 4/18/01  
**Length**  $\approx$ (+/- 1%) 520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,856 pounds  
1,749 kilograms

**Lot Number** 8210143  
**Type** TR400GS  
**Supplier** Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	160	( 279 )
- MD		every roll	130	( 228 )	149	( 262 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	215	( 376 )
- MD		every roll	90	( 158 )	219	( 383 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		608	
- MD	(51 mm)	every roll	150		609	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		24	
Average (mils)						

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108448

## ROLL IDENTIFICATION

Roll Number	104108448	
Product Name	HDT060A000	
Production Date	4/18/01	
Length $\pm$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,878 pounds 1,759 kilograms	

## RESIN INFORMATION

Lot Number	8210143
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	161	( 283 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	205	( 359 )
- MD		every roll	90	( 158 )	218	( 381 )
Yield Elongation, % - TD		every roll				
- MD	gauge length = 1.3"		13		17	
Break Elongation, % - TD	(33 mm)	every roll	13		17	
- MD	gauge length = 2.0"		150		578	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108449

## ROLL IDENTIFICATION

## RESIN INFORMATION

**Roll Number** 104108449  
**Product Name** HDT060A000  
**Production Date** 4/18/01  
**Length**  $\approx (+/- 1\%)$  520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,862 pounds  
1,752 kilograms

**Lot Number** 8210143  
**Type** TR400GS  
**Supplier** Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 286 )
- MD		every roll	130	( 228 )	156	( 274 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	198	( 346 )
- MD		every roll	90	( 158 )	214	( 375 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		564	
- MD	(51 mm)	every roll	150		575	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		16	
Average (mils)						

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108450

## ROLL IDENTIFICATION

Roll Number	104108450	
Product Name	HDT060A000	
Production Date	4/18/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,861	pounds
	1,751	kilograms

## RESIN INFORMATION

Lot Number	8210141
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	163	( 285 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	209	( 366 )
- MD		every roll	90	( 158 )	200	( 349 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		598	
- MD	(51 mm)	every roll	150		551	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108451

## ROLL IDENTIFICATION

Roll Number 104108451  
 Product Name HDT060A000  
 Production Date 4/18/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,864 pounds  
 1,753 kilograms

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	166	( 290 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	223	( 390 )
- MD		every roll	90	( 158 )	244	( 427 )
Yield Elongation, % - TD		every roll	13		17	
- MD		every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0" (51 mm)	every roll	150		609	
- MD		every roll	150		623	
Tear Resistance, lb. (N)						
- TD	ASTM D 1004	every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %		every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		26	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108452

## ROLL IDENTIFICATION

**Roll Number** 104108452  
**Product Name** HDT060A000  
**Production Date** 4/18/01  
**Length**  $\approx (+/- 1\%)$  520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,865 pounds  
1,753 kilograms

## RESIN INFORMATION

**Lot Number** 8210141  
**Type** TR400GS  
**Supplier** Phillips

## GSE RESIN TEST DATA

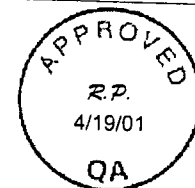
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 297 )
- MD		every roll	130	( 228 )	164	( 287 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	214	( 375 )
- MD		every roll	90	( 158 )	246	( 430 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		589	
- MD	(51 mm)	every roll	150		636	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.6	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		17	
Average (mils)						

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108453

## ROLL IDENTIFICATION

Roll Number	104108453
Product Name	HDT060A000
Production Date	4/18/01
Length $\approx (+/- 1\%)$	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,825 pounds 1,735 kilograms

## RESIN INFORMATION

Lot Number	8210141
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

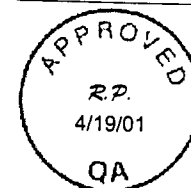
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	155	( 272 )
- MD		every roll	130	( 228 )	160	( 280 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	232	( 406 )
- MD		every roll	90	( 158 )	235	( 411 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		639	
- MD	(51 mm)	every roll	150		635	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		25	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108456

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 104108456  
 Product Name HDT060A000  
 Production Date 4/18/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters

Width (Nominal) 22.5 feet  
 6.9 meters

Sheet Area 11,700 sq. feet  
 1,086 sq. meters

Weight 3,871 pounds  
 1,756 kilograms

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	161	( 282 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	230	( 402 )
- MD		every roll	90	( 158 )	230	( 403 )
Yield Elongation, % - TD		every roll	13		18	
- MD					18	
Break Elongation, % - TD	gauge length = 2.0" (51 mm)	every roll	150		639	
- MD		every roll	150		621	
Tear Resistance, lb. (N)						
- TD	ASTM D 1004	every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height Average (mils)	GRI GM 12	every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108457

## ROLL IDENTIFICATION

Roll Number	104108457	
Product Name	HDT060A000	
Production Date	4/18/01	
Length $\pm$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,872 1,756	pounds kilograms

## RESIN INFORMATION

Lot Number	8210141
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

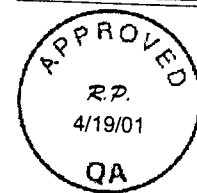
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 283 )
- MD		every roll	130	( 228 )	163	( 285 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	243	( 425 )
- MD		every roll	90	( 158 )	228	( 400 )
Yield Elongation, % - TD		every roll	13		17	
- MD		every roll	13		17	
Break Elongation, % - TD	ASTM D 1004	every roll	150		646	
- MD		every roll	150		629	
Tear Resistance, lb. (N)		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	162	( 721 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		20	
Average (mils)						

Order No.	20979
Customer Name	PASCO COUNTY LANDFILL
Location	DADE CITY, FLORIDA

\*Modified

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Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 26, 2001

PSN# 4859-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210141
P.O. Number:	
Date Shipped:	02/23/01
Package:	PSPX 7123
Quantity:	180100 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate, ASTM D1238:	11.8 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	.08
Production Date:	02/09/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	114.800

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 23, 2001

PSN# 4861-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210143
P.O. Number:	
Date Shipped:	02/23/01
Package:	PSPX 1292
Quantity:	185400 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate, ASTM D1238:	12.2 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	152.
Production Date:	02/09/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	110.250

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630





Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 23, 2001

PSN# 4857-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210163
P.O. Number:	
Date Shipped:	02/23/01
Package:	PSPX 2213
Quantity:	187150 LBS.
Melt Index, ASTM D1238:	.070 G/10 MIN
HLMI Flow Rate, ASTM D1238:	10.2 G/10 MIN
Density, ASTM D1505:	.938 G/CC
HLMI/MI Ratio:	146.
Production Date:	02/13/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	108.500

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

Job: 06104-28936-

To: Handex of Florida, Inc.

2306 Gravel Drive

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

6 print(s) each of the following Submittal: D-02776-014-A (QA/QC Roll Certificates: 60 mil HDPE  
Textured Liner (Set 3 of 4))

which are:

- |    |                                  |                                     |
|----|----------------------------------|-------------------------------------|
| 1. | APPROVED .....                   | <input checked="" type="checkbox"/> |
| 2. | APPROVED AS NOTED .....          | <input type="checkbox"/>            |
| 3. | APPROVED AS NOTED/CONFIRM .....  | <input type="checkbox"/>            |
| 4. | APPROVED AS NOTED/RESUBMIT ..... | <input type="checkbox"/>            |
| 5. | NOT APPROVED .....               | <input type="checkbox"/>            |
| 6. | COMMENTS ATTACHED .....          | <input type="checkbox"/>            |
| 7. | FOR YOUR INFORMATION .....       | <input type="checkbox"/>            |
| 8. | FOR YOUR REVIEW .....            | <input type="checkbox"/>            |

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2

Owner:	Pasco County B.O.C.C.	Project No.	01-063	Project Manager:	John Powell
Engineer:	Camp Dresser & McKee	Project No.	6104-28936	Project Manager:	Daniel Strobridge, Q.E.P.
Contractor:	Handex of Florida, Inc.	Project No.	123477	Project Manager:	Gary L. Conaway, P.E.
Subcontractor:	COMANCO Environmental Corp.	Project No.	010-848	Project Manager:	Pablo J. Rivera

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: 

Date: 11-15-01

Submittal Identifier: D-02776-014-A



Original Submittal

Supplement

Submitted: November 15, 2001

No. of Copies: 8

Resubmittal

Information Only

Submittal Description: QA/QC Roll Certificates: 60 mil HDPE Textured Liner (Set 3 of 4) (52 rolls)

Specification Identifier: 01300, 02776 Section 1.03A.1(d)

Manufacturer: GSE Lining Technologies, Inc.

Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

Code 1 - Approved

Code 4 - Approved As Noted, Resubmit

Code 2 - Approved As Noted

Code 5 - Not Approved

Code 3 - Approved As Noted, Confirm

Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

## SHOP DRAWING REVIEW

ENGINEER'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>
Approved/As Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in the submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

CAMP DRESSER &amp; MCKEE INC.

By

AMS

Date

12/3/01



Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108458

## ROLL IDENTIFICATION

Roll Number 104108458  
 Product Name HDT060A000  
 Production Date 4/18/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,842 pounds  
 1,743 kilograms

## GSE RESIN TEST DATA

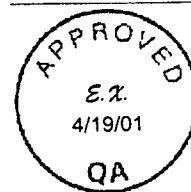
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	163	( 285 )
- MD		every roll	130	( 228 )	168	( 294 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	225	( 393 )
- MD		every roll	90	( 158 )	234	( 409 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		619
- MD	(51 mm)	every roll		150		622
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev - - 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108459

## ROLL IDENTIFICATION

Roll Number 104108459  
 Product Name HDT060A000  
 Production Date 4/18/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,883 pounds  
 1,761 kilograms

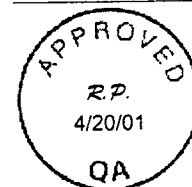
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 297 )
- MD		every roll	130	( 228 )	161	( 281 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	238	( 417 )
- MD		every roll	90	( 158 )	238	( 416 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		644
- MD	(51 mm)	every roll		150		625
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev - - 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108460

## ROLL IDENTIFICATION

Roll Number 104108460  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,834 pounds  
 1,739 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	159	( 278 )
- MD		every roll	130	( 228 )	156	( 273 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	197	( 345 )
- MD		every roll	90	( 158 )	221	( 387 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		586
- MD	(51 mm)	every roll		150		606
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		13

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108462

## ROLL IDENTIFICATION

Roll Number 104108462  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,918 pounds  
 1,777 kilograms

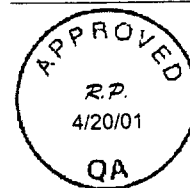
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 299 )
- MD		every roll	130	( 228 )	168	( 294 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	225	( 394 )
- MD		every roll	90	( 158 )	205	( 359 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		567	
- MD	(51 mm)	every roll	150		557	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		16	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108463

## ROLL IDENTIFICATION

Roll Number	104108463
Product Name	HDT060A000
Production Date	4/19/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,858 pounds 1,750 kilograms

## RESIN INFORMATION

Lot Number	8210141
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 292 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	216	( 378 )
- MD		every roll	90	( 158 )	224	( 393 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		588
- MD	(51 mm)	every roll		150		578
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00







Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108464

## ROLL IDENTIFICATION

Roll Number 104108464  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,888 pounds  
 1,764 kilograms

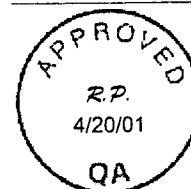
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	172	( 301 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	196	( 343 )
- MD		every roll	90	( 158 )	208	( 364 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		576	
- MD	(51 mm)	every roll	150		548	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		11	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev - - 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108466

## ROLL IDENTIFICATION

Roll Number 104108466  
 Product Name HDT060A000  
 Production Date 4/19/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,938 pounds  
 1,786 kilograms

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	176	( 308 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	133	( 233 )
- MD		every roll	90	( 158 )	131	( 230 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		349	
- MD	(51 mm)	every roll	150		417	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		17	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108468

## ROLL IDENTIFICATION

Roll Number 104108468  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,929 pounds  
 1,782 kilograms

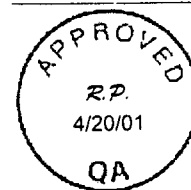
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 304 )
- MD		every roll	130	( 228 )	176	( 307 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	147	( 258 )
- MD		every roll	90	( 158 )	223	( 391 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		18
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		400
- MD	(51 mm)	every roll		150		570
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		16

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108469

## ROLL IDENTIFICATION

Roll Number 104108469  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,900 pounds  
 1,769 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	180	( 315 )
- MD		every roll	130	( 228 )	183	( 320 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	135	( 236 )
- MD		every roll	90	( 158 )	145	( 255 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		18
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		256
- MD	(51 mm)	every roll		150		340
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	164	( 730 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108470

## ROLL IDENTIFICATION

Roll Number 104108470  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,898 pounds  
 1,768 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 307 )
- MD		every roll	130	( 228 )	178	( 311 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	174	( 305 )
- MD		every roll	90	( 158 )	142	( 249 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		15
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		510
- MD	(51 mm)	every roll		150		350
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		26

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108471

## ROLL IDENTIFICATION

Roll Number 104108471  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,853 pounds  
 1,748 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 263 )
- MD		every roll	90	( 158 )	181	( 316 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		430	
- MD	(51 mm)	every roll	150		380	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	107	( 476 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107893

## ROLL IDENTIFICATION

Roll Number 105107893  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,886 pounds  
 1,763 kilograms

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 297 )
- MD		every roll	130	( 228 )	165	( 289 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	166	( 291 )
- MD		every roll	90	( 158 )	180	( 315 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		492
- MD	(51 mm)	every roll		150		488
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		25

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108472

## ROLL IDENTIFICATION

Roll Number 104108472  
 Product Name HDT060A000  
 Production Date 4/19/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,814 pounds  
 1,730 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	177	( 309 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	203	( 356 )
- MD		every roll	90	( 158 )	196	( 343 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		580	
- MD	(51 mm)	every roll	150		490	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 104108473

## ROLL IDENTIFICATION

Roll Number 104108473  
 Product Name HDT060A000  
 Production Date 4/20/01

## RESIN INFORMATION

Lot Number 8210141  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,844 pounds  
 1,744 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum		Test Results	
			English	Metric	English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	173	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	209	( 365 )
- MD		every roll	90	( 158 )	174	( 304 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		600	
- MD	(51 mm)	every roll	150		470	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107690

## ROLL IDENTIFICATION

Roll Number	105107690
Product Name	HDT060A000
Production Date	3/29/01

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

<b>Length</b> $\approx$ (+/- 1%)	520	feet	<b>GSE RESIN TEST DATA</b>		
	158	meters			
<b>Width</b> (Nominal)	22.5	feet	<u>Property</u>	<u>Test Method</u>	<u>Results</u>
	6.9	meters	<b>Density, g/cc</b>	<b>ASTM D 1505</b>	0.940
<b>Sheet Area</b>	11,700	sq. feet	<b>Melt index, g/10 min.</b>	<b>ASTM D 1238 (190/2.16)</b>	0.12
	1,086	sq. meters			
<b>Weight</b>	3,940	pounds			
	1,787	kilograms			

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 290 )
- MD		every roll	130	( 228 )	186	( 326 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	153	( 269 )
- MD		every roll	90	( 158 )	157	( 275 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		431
- MD	(51 mm)	every roll		150		331
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	136	( 605 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 105107692

## ROLL IDENTIFICATION

Roll Number 105107692  
Product Name HDT060A000  
Production Date 3/29/01

## RESIN INFORMATION

Lot Number MT21020421  
Type XL3812  
Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,952 pounds  
1,793 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	180	( 314 )
- MD		every roll	130	( 228 )	176	( 309 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	167	( 293 )
- MD		every roll	90	( 158 )	180	( 314 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		447
- MD	(51 mm)	every roll		150		462
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	67	( 298 )
- MD		every roll	42	( 187 )	62	( 276 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	152	( 676 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	96	( 427 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12	every roll		10		19
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107695

## ROLL IDENTIFICATION

Roll Number 105107695  
 Product Name HDT060A000  
 Production Date 3/29/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,906 pounds  
 1,772 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	153	( 269 )
- MD		every roll	90	( 158 )	141	( 247 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		438
- MD	(51 mm)	every roll		150		448
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	62	( 276 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	96	( 427 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107696

## ROLL IDENTIFICATION

Roll Number	105107696
Product Name	HDT060A000
Production Date	3/29/01

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Length $\approx$ (+/- 1%)		
	520 feet	
	158 meters	
Width (Nominal)		
	22.5 feet	
	6.9 meters	
Sheet Area		
	11,700 sq. feet	
	1,086 sq. meters	
Weight		
	3,918 pounds	
	1,777 kilograms	

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	168	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 283 )
- MD		every roll	90	( 158 )	142	( 248 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		481
- MD	(51 mm)	every roll		150		449
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	139	( 619 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.944
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		18

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107697

## ROLL IDENTIFICATION

Roll Number 105107697  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,927 pounds  
 1,781 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 286 )
- MD		every roll	130	( 228 )	165	( 289 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	156	( 274 )
- MD		every roll	90	( 158 )	140	( 245 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		480	
- MD	(51 mm)	every roll	150		368	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	136	( 605 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		17	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107698

## ROLL IDENTIFICATION

Roll Number 105107698  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,920 pounds  
 1,778 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	60	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 307 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	135	( 237 )
- MD		every roll	90	( 158 )	180	( 316 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		231
- MD	(51 mm)	every roll		150		504
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.944
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height Average (mils)	GRI GM 12	every roll		10		22

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 105107699

## ROLL IDENTIFICATION

Roll Number 105107699  
Product Name HDT060A000  
Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
Type XL3812  
Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,913 pounds  
1,775 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	171	( 299 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 283 )
- MD		every roll	90	( 158 )	151	( 264 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		440
- MD	(51 mm)	every roll		150		393
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.944
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107700

## ROLL IDENTIFICATION

Roll Number	105107700	
Product Name	HDT060A000	
Production Date	3/30/01	
Length $\pm$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,978 1,804	pounds kilograms

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 307 )
- MD		every roll	130	( 228 )	172	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	154	( 270 )
- MD		every roll	90	( 158 )	145	( 254 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		491	
- MD	(51 mm)	every roll	150		350	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	143	( 636 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107701

## ROLL IDENTIFICATION

Roll Number	105107701
Product Name	HDT060A000
Production Date	3/30/01

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

Length $\pm$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,968 pounds 1,800 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 302 )
- MD		every roll	130	( 228 )	176	( 307 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	166	( 290 )
- MD		every roll	90	( 158 )	168	( 294 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		538
- MD	(51 mm)	every roll		150		474
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		28

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107702

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 105107702  
 Product Name HDT060A000  
 Production Date 3/30/01

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,972 pounds  
 1,802 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	178	( 311 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	157	( 275 )
- MD		every roll	90	( 158 )	169	( 297 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		374
- MD	(51 mm)	every roll		150		456
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	161	( 716 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		18

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107703

## ROLL IDENTIFICATION

Roll Number 105107703  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,932 pounds  
 1,784 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	184	( 322 )
- MD		every roll	130	( 228 )	192	( 337 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	155	( 271 )
- MD		every roll	90	( 158 )	178	( 311 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		15
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		388
- MD	(51 mm)	every roll		150		471
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107704

## ROLL IDENTIFICATION

Roll Number 105107704  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,956 pounds  
 1,794 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 299 )
- MD		every roll	130	( 228 )	175	( 306 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 263 )
- MD		every roll	90	( 158 )	178	( 312 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		437	
- MD	(51 mm)	every roll	150		451	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107705

## ROLL IDENTIFICATION

Roll Number 105107705  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,988 pounds  
 1,809 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	185	( 324 )
- MD		every roll	130	( 228 )	182	( 318 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	165	( 288 )
- MD		every roll	90	( 158 )	158	( 276 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		465	
- MD	(51 mm)	every roll	150		385	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107708

## ROLL IDENTIFICATION

**Roll Number** 105107708  
**Product Name** HDT060A000  
**Production Date** 3/30/01  
**Length**  $\approx$  (+/- 1%) 520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,891 pounds  
1,765 kilograms

## RESIN INFORMATION

**Lot Number** MT21020421  
**Type** XL3812  
**Supplier** Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	185	( 324 )
- MD		every roll	130	( 228 )	176	( 309 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	139	( 244 )
- MD		every roll	90	( 158 )	175	( 305 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		420
- MD	(51 mm)	every roll		150		467
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	63	( 280 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	154	( 685 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107709

## ROLL IDENTIFICATION

Roll Number 105107709  
 Product Name HDT060A000  
 Production Date 3/30/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,910 pounds  
 1,774 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	177	( 310 )
- MD		every roll	130	( 228 )	184	( 321 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	176	( 308 )
- MD		every roll	90	( 158 )	179	( 312 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		508
- MD	(51 mm)	every roll		150		487
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		14

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107710

## ROLL IDENTIFICATION

Roll Number	105107710	
Product Name	HDT060A000	
Production Date	3/31/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,890 pounds 1,765 kilograms	

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	178	( 311 )
- MD		every roll	130	( 228 )	172	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	144	( 251 )
- MD		every roll	90	( 158 )	179	( 314 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		281
- MD	(51 mm)	every roll		150		477
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107711

## ROLL IDENTIFICATION

Roll Number 105107711  
 Product Name HDT060A000  
 Production Date 3/31/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,868 pounds  
 1,755 kilograms

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 300 )
- MD		every roll	130	( 228 )	178	( 311 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	167	( 292 )
- MD		every roll	90	( 158 )	186	( 326 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		493	
- MD	(51 mm)	every roll	150		523	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	151	( 672 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 105107712

## ROLL IDENTIFICATION

Roll Number 105107712  
Product Name HDT060A000  
Production Date 3/31/01

Length  $\pm$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,894 pounds  
1,766 kilograms

## RESIN INFORMATION

Lot Number MT21020421  
Type XL3812  
Supplier Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	172	( 302 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 262 )
- MD		every roll	90	( 158 )	177	( 309 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		399	
- MD	(51 mm)	every roll	150		471	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107713

## ROLL IDENTIFICATION

Roll Number 105107713  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,946 pounds  
 1,790 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 308 )
- MD		every roll	130	( 228 )	185	( 324 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	168	( 294 )
- MD		every roll	90	( 158 )	170	( 298 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		14
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		453
- MD	(51 mm)	every roll		150		474
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107714

## ROLL IDENTIFICATION

Roll Number 105107714  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,950 pounds  
 1,792 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 290 )
- MD		every roll	130	( 228 )	169	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 263 )
- MD		every roll	90	( 158 )	192	( 335 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		477	
- MD	(51 mm)	every roll	150		549	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107717

## ROLL IDENTIFICATION

Roll Number	105107717	
Product Name	HDT060A000	
Production Date	3/31/01	
Length $\approx$ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,924 1,780	pounds kilograms

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 304 )
- MD		every roll	130	( 228 )	170	( 298 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	209	( 365 )
- MD		every roll	90	( 158 )	214	( 375 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		590
- MD	(51 mm)	every roll		150		550
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		16

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107715

## ROLL IDENTIFICATION

Roll Number 105107715  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,910 pounds  
 1,774 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	182	( 319 )
- MD		every roll	130	( 228 )	178	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	159	( 278 )
- MD		every roll	90	( 158 )	178	( 312 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		359	
- MD	(51 mm)	every roll	150		429	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	162	( 721 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	103	( 458 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		27	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107716

## ROLL IDENTIFICATION

Roll Number 105107716  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,894 pounds  
 1,766 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	178	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	158	( 276 )
- MD		every roll	90	( 158 )	150	( 262 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		408	
- MD	(51 mm)	every roll	150		387	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107718

## ROLL IDENTIFICATION

Roll Number 105107718  
 Product Name HDT060A000  
 Production Date 3/31/01

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,892 pounds  
 1,765 kilograms

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 300 )
- MD		every roll	130	( 228 )	168	( 294 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	198	( 346 )
- MD		every roll	90	( 158 )	224	( 392 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		580	
- MD	(51 mm)	every roll	150		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	142	( 632 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		24	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107719

## ROLL IDENTIFICATION

Roll Number	105107719
Product Name	HDT060A000
Production Date	3/31/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,860 pounds 1,751 kilograms

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 302 )
- MD		every roll	130	( 228 )	169	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	222	( 389 )
- MD		every roll	90	( 158 )	203	( 356 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		610
- MD	(51 mm)	every roll		150		500
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

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Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107720

## ROLL IDENTIFICATION

Roll Number 105107720  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,804 pounds  
 1,725 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	170	( 298 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	206	( 361 )
- MD		every roll	90	( 158 )	208	( 364 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		570
- MD	(51 mm)	every roll		150		530
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		16

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 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107721

## ROLL IDENTIFICATION

Roll Number 105107721  
 Product Name HDT060A000  
 Production Date 3/31/01

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,826 pounds  
 1,735 kilograms

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	159	( 279 )
- MD		every roll	130	( 228 )	157	( 274 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	199	( 349 )
- MD		every roll	90	( 158 )	191	( 335 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		580	
- MD	(51 mm)	every roll	150		540	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	143	( 636 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		19	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107722

## ROLL IDENTIFICATION

Roll Number 105107722  
 Product Name HDT060A000  
 Production Date 3/31/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,842 pounds  
 1,743 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 297 )
- MD		every roll	130	( 228 )	163	( 286 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	214	( 375 )
- MD		every roll	90	( 158 )	206	( 360 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		570	
- MD	(51 mm)	every roll	150		510	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107723

## ROLL IDENTIFICATION

Roll Number	105107723	
Product Name	HDT060A000	
Production Date	4/1/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,842 pounds 1,743 kilograms	

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	183	( 320 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	164	( 287 )
- MD		every roll	90	( 158 )	161	( 281 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		376	
- MD	(51 mm)	every roll	150		460	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	50	( 223 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107724

## ROLL IDENTIFICATION

**Roll Number** 105107724  
**Product Name** HDT060A000  
**Production Date** 4/1/01  
**Length**  $\approx (+/- 1\%)$  520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,874 pounds  
1,757 kilograms

## RESIN INFORMATION

**Lot Number** MT21020421  
**Type** XL3812  
**Supplier** Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	157	( 274 )
- MD		every roll	130	( 228 )	155	( 271 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	191	( 335 )
- MD		every roll	90	( 158 )	197	( 345 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		572	
- MD	(51 mm)	every roll	150		558	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	48	( 214 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		19	
Average (mils)						

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107725

## ROLL IDENTIFICATION

Roll Number	105107725	
Product Name	HDT060A000	
Production Date	4/1/01	
Length $\approx (+/- 1\%)$	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,894 1,766	pounds kilograms

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	176	( 309 )
- MD		every roll	130	( 228 )	180	( 316 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	156	( 273 )
- MD		every roll	90	( 158 )	150	( 262 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		340	
- MD	(51 mm)	every roll	150		428	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00







# Roll Test Data Report

Lining Technology, Inc.

Roll No. 105107726

## ROLL IDENTIFICATION

Roll Number 105107726  
Product Name HDT060A000  
Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
Type XL3812  
Supplier Equistar

Length  $\pm$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,900 pounds  
1,769 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	184	( 322 )
- MD		every roll	130	( 228 )	181	( 317 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	161	( 282 )
- MD		every roll	90	( 158 )	166	( 291 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		341	
- MD	(51 mm)	every roll	150		425	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	142	( 632 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107727

## ROLL IDENTIFICATION

Roll Number	105107727	
Product Name	HDT060A000	
Production Date	4/1/01	
Length $\approx$ (+/- 1%)	520	feet
	158	meters
Width (Nominal)	22.5	feet
	6.9	meters
Sheet Area	11,700	sq. feet
	1,086	sq. meters
Weight	3,900	pounds
	1,769	kilograms

## RESIN INFORMATION

Lot Number	MT21020421
Type	XL3812
Supplier	Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 302 )
- MD		every roll	130	( 228 )	178	( 311 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	147	( 257 )
- MD		every roll	90	( 158 )	156	( 274 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		333	
- MD	(51 mm)	every roll	150		435	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	52	( 231 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	169	( 752 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107728

## ROLL IDENTIFICATION

## RESIN INFORMATION

**Roll Number** 105107728  
**Product Name** HDT060A000  
**Production Date** 4/1/01  
**Length**  $\approx (+/- 1\%)$  520 feet  
158 meters  
**Width (Nominal)** 22.5 feet  
6.9 meters  
**Sheet Area** 11,700 sq. feet  
1,086 sq. meters  
**Weight** 3,864 pounds  
1,753 kilograms

**Lot Number** MT21020421  
**Type** XL3812  
**Supplier** Equistar

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	177	( 309 )
- MD		every roll	130	( 228 )	177	( 310 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	142	( 249 )
- MD		every roll	90	( 158 )	133	( 233 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		296	
- MD	(51 mm)	every roll	150		310	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		22	

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev -- 07/00





Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 16, 2001

PSN# 4086-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundie Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210165
P.O. Number:	
Date Shipped:	02/16/01
Package:	PSPX 6547
Quantity:	179550 LBS.
Melt Index, ASTM D1238:	.070 G/10 MIN
HLMI Flow Rate, ASTM D1238:	10.1 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	144.
Production Date:	02/13/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	120.667

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 26, 2001

PSN# 4859-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210141
P.O. Number:	
Date Shipped:	02/23/01
Package:	PSPX 7123
Quantity:	180100 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate, ASTM D1238:	11.8 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	.08
Production Date:	02/09/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	114.800

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630

Equistar Chemicals, LP  
Matagorda Plant  
13 Miles S. of Bay City-Hwy 60  
Bay City, TX 77414

## Certificate Of Analysis

DON BOHAC  
GSE LINING TECHNOLOGIES  
WESTFIELD TX 77060  
FAX No. : 281-230-8630

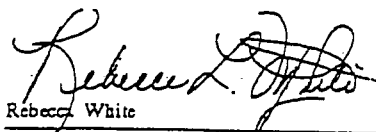
Customer Order No. : 18319-000-OP  
Customer Number : 7731  
Date Shipped : March 08, 2001  
Equistar Order No. : 387750 000010  
Delivery Item No. : 80490820 000010

Ship-To:  
GSE LINING TECHNOLOGY INC  
1340 E RICHEY RD  
WESTFIELD TX 77073  
UNITED STATES

Equistar Material : 7674 ALATHON XL3812  
Batch Number : MT21020421  
Estimated Quantity : 192,900 LBS

Test Description	Test Result	Unit of Measure	Inspection Method
Vehicle ID	EQUX631068		
Vehicle Type	HOPPER CAR		
Density @ 23C	0.940	g/cc	
Melt Flow, 2160g @ 190C	0.115	g/10 min.	

Approved by:

  
Rebecca White

Issue Date: March 14, 2001

Question ? Call Customer  
Service: 888-777-0232

This Certificate of Analysis contains the most current information available as of the issue date.  
This document shall not be reproduced except in full, without the written approval of the issuer.

# TRANSMITTAL SHEET

consulting, engineering,  
construction, operations

# CDM

West Shore Center, Suite 875, 1715 N. West Shore Center Blvd.  
Tampa, FL 33607

Date: 12/5/01

To: Handex of Florida, Inc.  
2306 Gravel Drive

Job: 06104-28936-

W. Pasco County Landfill Expansion  
Cells A-3 and SW-2

Ft. Worth, TX 76118-

Attn: Gary Conaway, V. P.

5 print(s) each of the following Submittal: D-02776-015-A (QA/QC Roll Certificates: 60 mil HDPE  
Textured Liner (Set 4 of 4))


which are:

1. APPROVED ..... ☒
2. APPROVED AS NOTED ..... ☐
3. APPROVED AS NOTED/CONFIRM ..... ☐
4. APPROVED AS NOTED/RESUBMIT ..... ☐
5. NOT APPROVED ..... ☐
6. COMMENTS ATTACHED ..... ☐
7. FOR YOUR INFORMATION ..... ☐
8. FOR YOUR REVIEW ..... ☐

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CC: 1 - Jack McHugh/CDM  
1 - Construction File

By   
Abdul Mulla-Saleh

## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Powell</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 11-15-01Submittal Identifier: D-02776-015-A☒ Original Submittal☐ SupplementSubmitted: November 15, 2001No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: QA/QC Roll Certificates: 60 mil HDPE Textured Liner (Set 4 of 4) (51 rolls)Specification Identifier: 01300, 02776 Section 1.03A.1(d)Manufacturer: GSE Lining Technologies, Inc.Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

## SHOP DRAWING REVIEW

## ENGINEER'S REVIEW

Approved ☒ Not Approved ☐  
 Approved/As Noted ☐ Comments Attached ☐

## RESPONSE REQUIRED OF CONTRACTOR

Confirm ☐  
 Resubmit ☐

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

By AMSDate 12/2/01





Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107729

## ROLL IDENTIFICATION

Roll Number 105107729  
 Product Name HDT060A000  
 Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,884 pounds  
 1,762 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 305 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	198	( 347 )
- MD		every roll	90	( 158 )	146	( 256 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		15
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		450
- MD	(51 mm)	every roll		150		400
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	145	( 645 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		22

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107730

## ROLL IDENTIFICATION

Roll Number 105107730  
 Product Name HDT060A000  
 Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,864 pounds  
 1,753 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	180	( 315 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	158	( 276 )
- MD		every roll	90	( 158 )	150	( 263 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		340
- MD	(51 mm)	every roll		150		350
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		23

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107731

## ROLL IDENTIFICATION

Roll Number 105107731  
 Product Name HDT060A000  
 Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,864 pounds  
 1,753 kilograms

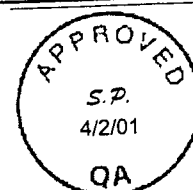
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994	every roll	60	( 1.5 )	60	( 1.5 )
Average		every roll	54	( 1.4 )	55	( 1.4 )
Minimum						
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	181	( 316 )
- MD		every roll	130	( 228 )	178	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 262 )
- MD		every roll	90	( 158 )	156	( 273 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		15
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		400
- MD	(51 mm)	every roll		150		380
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	141	( 627 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height Average (mils)	GRI GM 12	every roll		10		16

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107732

## ROLL IDENTIFICATION

Roll Number 105107732  
 Product Name HDT060A000  
 Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,862 pounds  
 1,752 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 301 )
- MD		every roll	130	( 228 )	179	( 314 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	194	( 339 )
- MD		every roll	90	( 158 )	169	( 295 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		550
- MD	(51 mm)	every roll		150		470
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height Average (mils)	GRI GM 12	every roll		10		27

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107733

## ROLL IDENTIFICATION

Roll Number 105107733  
 Product Name HDT060A000  
 Production Date 4/1/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,854 pounds  
 1,748 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 287 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	158	( 276 )
- MD		every roll	90	( 158 )	190	( 332 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		420
- MD	(51 mm)	every roll		150		530
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	97	( 432 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		23

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107734

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 105107734  
 Product Name HDT060A000  
 Production Date 4/1/01

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,856 pounds  
 1,749 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 290 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	204	( 357 )
- MD		every roll	90	( 158 )	202	( 354 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		550	
- MD	(51 mm)	every roll	150		530	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	144	( 641 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		24	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107735

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 105107735  
 Product Name HDT060A000  
 Production Date 4/1/01

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,884 pounds  
 1,762 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	160	( 280 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	158	( 277 )
- MD		every roll	90	( 158 )	192	( 336 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		320	
- MD	(51 mm)	every roll	150		540	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		18	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107736

## ROLL IDENTIFICATION

Roll Number 105107736  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,872 pounds  
 1,756 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D-1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	178	( 311 )
- MD		every roll	130	( 228 )	179	( 312 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	168	( 293 )
- MD		every roll	90	( 158 )	165	( 289 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		423	
- MD	(51 mm)	every roll	150		468	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		21	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107737

## ROLL IDENTIFICATION

Roll Number 105107737  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,884 pounds  
 1,762 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	174	( 304 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	133	( 232 )
- MD		every roll	90	( 158 )	155	( 271 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		247
- MD	(51 mm)	every roll		150		452
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		21

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107738

## ROLL IDENTIFICATION

Roll Number 105107738  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,906 pounds  
 1,772 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 298 )
- MD		every roll	130	( 228 )	169	( 296 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	170	( 297 )
- MD		every roll	90	( 158 )	132	( 231 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		454	
- MD	(51 mm)	every roll	150		209	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	105	( 467 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		12	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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**ROLL IDENTIFICATION**

**Roll Number** 105107741  
**Product Name** HDT060A000  
**Production Date** 4/2/01

**Length**  $\approx$  (+/- 1%) 520 feet  
 158 meters  
**Width (Nominal)** 22.5 feet  
 6.9 meters  
**Sheet Area** 11,700 sq. feet  
 1,086 sq. meters  
**Weight** 3,848 pounds  
 1,745 kilograms

**RESIN INFORMATION**

**Lot Number** MT21020421  
**Type** XL3812  
**Supplier** Equistar

**GSE RESIN TEST DATA**

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	173	( 303 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	150	( 263 )
- MD		every roll	90	( 158 )	150	( 263 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		356
- MD	(51 mm)	every roll		150		381
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	49	( 218 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

**Order No.** 20979  
**Customer Name** PASCO COUNTY LANDFILL  
**Location** DADE CITY, FLORIDA

\*Modified

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**ROLL IDENTIFICATION**

Roll Number 105107742  
 Product Name HDT060A000  
 Production Date 4/2/01

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,858 pounds  
 1,750 kilograms

**RESIN INFORMATION**

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

**GSE RESIN TEST DATA**

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	180	( 315 )
- MD		every roll	130	( 228 )	182	( 319 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	143	( 251 )
- MD		every roll	90	( 158 )	165	( 288 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		352
- MD	(51 mm)	every roll		150		424
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		13

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107743

## ROLL IDENTIFICATION

Roll Number 105107743  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,864 pounds  
 1,753 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 288 )
- MD		every roll	130	( 228 )	158	( 277 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	191	( 335 )
- MD		every roll	90	( 158 )	181	( 316 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		540	
- MD	(51 mm)	every roll	150		500	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107744

## ROLL IDENTIFICATION

Roll Number 105107744  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,874 pounds  
 1,757 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	223	( 391 )
- MD		every roll	90	( 158 )	171	( 300 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		570	
- MD	(51 mm)	every roll	150		530	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	143	( 636 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		23	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107745

## ROLL IDENTIFICATION

Roll Number 105107745  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,914 pounds  
 1,775 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	205	( 358 )
- MD		every roll	90	( 158 )	224	( 392 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		550
- MD	(51 mm)	every roll		150		590
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		18

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107746

## ROLL IDENTIFICATION

Roll Number 105107746  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,970 pounds  
 1,801 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 293 )
- MD		every roll	130	( 228 )	169	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	213	( 372 )
- MD		every roll	90	( 158 )	219	( 384 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		580
- MD	(51 mm)	every roll		150		600
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	141	( 627 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	115	( 512 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		12

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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# Roll Test Data Report

Lining Technology, Inc.

Roll No. 105107747

## ROLL IDENTIFICATION

Roll Number 105107747  
Product Name HDT060A000  
Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
Type XL3812  
Supplier Equistar

Length  $\approx$  (+/- 1%) 520 feet  
158 meters  
Width (Nominal) 22.5 feet  
6.9 meters  
Sheet Area 11,700 sq. feet  
1,086 sq. meters  
Weight 3,960 pounds  
1,796 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 283 )
- MD		every roll	130	( 228 )	169	( 295 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	210	( 368 )
- MD		every roll	90	( 158 )	206	( 360 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		550
- MD	(51 mm)	every roll		150		580
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	140	( 623 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	115	( 512 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

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Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107748

## ROLL IDENTIFICATION

Roll Number 105107748  
 Product Name HDT060A000  
 Production Date 4/2/01

## RESIN INFORMATION

Lot Number MT21020421  
 Type XL3812  
 Supplier Equistar

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,982 pounds  
 1,806 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.940
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.12

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	54	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	163	( 286 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	192	( 336 )
- MD		every roll	90	( 158 )	174	( 305 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		540
- MD	(51 mm)	every roll		150		500
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	54	( 240 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	143	( 636 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	115	( 512 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		28

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 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107749

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 105107749  
 Product Name HDT060A000  
 Production Date 4/3/01

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,962 pounds  
 1,797 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	172	( 301 )
- MD		every roll	130	( 228 )	164	( 287 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	140	( 244 )
- MD		every roll	90	( 158 )	172	( 301 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		303	
- MD	(51 mm)	every roll	150		457	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	115	( 512 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107750

## ROLL IDENTIFICATION

Roll Number	105107750	
Product Name	HDT060A000	
Production Date	4/3/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,940 pounds 1,787 kilograms	

## RESIN INFORMATION

Lot Number	8201758
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

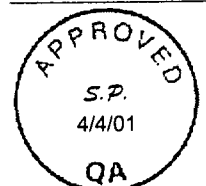
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	168	( 294 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	178	( 311 )
- MD		every roll	90	( 158 )	196	( 342 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		507
- MD	(51 mm)	every roll		150		518
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		18

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107754

## ROLL IDENTIFICATION

Roll Number 105107754  
 Product Name HDT060A000  
 Production Date 4/3/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,978 pounds  
 1,804 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	170	( 297 )
- MD		every roll	130	( 228 )	169	( 296 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	195	( 341 )
- MD		every roll	90	( 158 )	191	( 334 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		531	
- MD	(51 mm)	every roll	150		512	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	62	( 276 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	163	( 725 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		12	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107755

## ROLL IDENTIFICATION

Roll Number 105107755  
 Product Name HDT060A000  
 Production Date 4/3/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,062 pounds  
 1,843 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	168	( 294 )
- MD		every roll	130	( 228 )	179	( 313 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	184	( 321 )
- MD		every roll	90	( 158 )	191	( 334 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		522	
- MD	(51 mm)	every roll	150		531	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	62	( 276 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		24	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107758

## ROLL IDENTIFICATION

Roll Number 105107758  
 Product Name HDT060A000  
 Production Date 4/3/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,884 pounds  
 1,762 kilograms

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 288 )
- MD		every roll	130	( 228 )	162	( 284 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	173	( 303 )
- MD		every roll	90	( 158 )	196	( 344 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		446
- MD	(51 mm)	every roll		150		540
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107760

## ROLL IDENTIFICATION

Roll Number 105107760  
 Product Name HDT060A000  
 Production Date 4/3/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

Length  $\pm$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,916 pounds  
 1,776 kilograms

## GSE RESIN TEST DATA

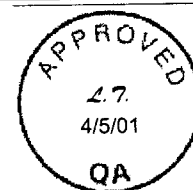
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 288 )
- MD		every roll	130	( 228 )	167	( 292 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	181	( 316 )
- MD		every roll	90	( 158 )	204	( 357 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		469
- MD	(51 mm)	every roll		150		540
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	62	( 276 )
- MD		every roll	42	( 187 )	59	( 263 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		15

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107763

## ROLL IDENTIFICATION

Roll Number 105107763  
 Product Name HDT060A000  
 Production Date 4/4/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,906 pounds  
 1,772 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 283 )
- MD		every roll	130	( 228 )	157	( 275 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	174	( 304 )
- MD		every roll	90	( 158 )	184	( 323 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		521
- MD	(51 mm)	every roll		150		495
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107764

## ROLL IDENTIFICATION

Roll Number 105107764  
 Product Name HDT060A000  
 Production Date 4/4/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,906 pounds  
 1,772 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 300 )
- MD		every roll	130	( 228 )	163	( 285 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	193	( 338 )
- MD		every roll	90	( 158 )	186	( 326 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		551
- MD	(51 mm)	every roll		150		526
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	59	( 263 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	98	( 436 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		20

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107766

## ROLL IDENTIFICATION

Roll Number 105107766  
 Product Name HDT060A000  
 Production Date 4/4/01

## RESIN INFORMATION

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,902 pounds  
 1,770 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 284 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	178	( 312 )
- MD		every roll	90	( 158 )	182	( 318 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		506
- MD	(51 mm)	every roll		150		513
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	149	( 663 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		18

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 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107769

## ROLL IDENTIFICATION

## RESIN INFORMATION

Roll Number 105107769  
 Product Name HDT060A000  
 Production Date 4/4/01

Lot Number 8201758  
 Type TR400GS  
 Supplier Phillips

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,922 pounds  
 1,779 kilograms

## GSE RESIN TEST DATA

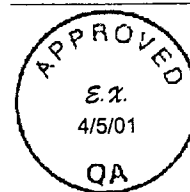
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	161	( 282 )
- MD		every roll	130	( 228 )	174	( 305 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	192	( 337 )
- MD		every roll	90	( 158 )	161	( 282 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		546	
- MD	(51 mm)	every roll	150		451	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	63	( 280 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	164	( 730 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107772

## ROLL IDENTIFICATION

Roll Number 105107772  
 Product Name HDT060A000  
 Production Date 4/4/01

## RESIN INFORMATION

Lot Number 8210160  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,884 pounds  
 1,762 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 286 )
- MD		every roll	130	( 228 )	161	( 282 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	192	( 336 )
- MD		every roll	90	( 158 )	205	( 359 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		18
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		520
- MD	(51 mm)	every roll		150		554
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	159	( 708 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.0
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107773

## ROLL IDENTIFICATION

Roll Number	105107773	
Product Name	HDT060A000	
Production Date	4/4/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,868 pounds 1,755 kilograms	

## RESIN INFORMATION

Lot Number	8210160
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

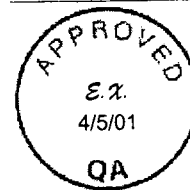
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	162	( 284 )
- MD		every roll	130	( 228 )	171	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	173	( 303 )
- MD		every roll	90	( 158 )	208	( 364 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		502
- MD	(51 mm)	every roll		150		553
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	61	( 271 )
- MD		every roll	42	( 187 )	60	( 267 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	100	( 445 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.0
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		17

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107786

## ROLL IDENTIFICATION

Roll Number 105107786  
 Product Name HDT060A000  
 Production Date 4/6/01

## RESIN INFORMATION

Lot Number 8210160  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,078 pounds  
 1,850 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 293 )
- MD		every roll	130	( 228 )	169	( 296 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	133	( 233 )
- MD		every roll	90	( 158 )	149	( 261 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		423	
- MD	(51 mm)	every roll	150		379	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	166	( 739 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		21	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107787

## ROLL IDENTIFICATION

Roll Number 105107787  
 Product Name HDT060A000  
 Production Date 4/6/01

## RESIN INFORMATION

Lot Number 8210160  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,110 pounds  
 1,864 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	59	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 287 )
- MD		every roll	130	( 228 )	168	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	163	( 285 )
- MD		every roll	90	( 158 )	189	( 331 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		420	
- MD	(51 mm)	every roll	150		521	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	63	( 280 )
- MD		every roll	42	( 187 )	57	( 253 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	168	( 745 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		20	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107789

## ROLL IDENTIFICATION

Roll Number 105107789  
 Product Name HDT060A000  
 Production Date 4/6/01

## RESIN INFORMATION

Lot Number 8210160  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 4,030 pounds  
 1,828 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	56	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	174	( 304 )
- MD		every roll	130	( 228 )	179	( 314 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	170	( 297 )
- MD		every roll	90	( 158 )	178	( 312 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		20	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		455	
- MD	(51 mm)	every roll	150		457	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	53	( 236 )
- MD		every roll	42	( 187 )	51	( 227 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	153	( 681 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	101	( 449 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height Average (mils)	GRI GM 12	every roll	10		18	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107798

## ROLL IDENTIFICATION

Roll Number	105107798	
Product Name	HDT060A000	
Production Date	4/7/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	4,004 pounds 1,816 kilograms	

## RESIN INFORMATION

Lot Number	8210160
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	64	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	169	( 296 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	156	( 272 )
- MD		every roll	90	( 158 )	208	( 364 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		449
- MD	(51 mm)	every roll		150		541
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	60	( 267 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	164	( 730 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	102	( 454 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		24

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107803

## ROLL IDENTIFICATION

Roll Number 105107803  
 Product Name HDT060A000  
 Production Date 4/7/01

## RESIN INFORMATION

Lot Number 8210160  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx (+/- 1\%)$  520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,950 pounds  
 1,792 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	173	( 303 )
- MD		every roll	130	( 228 )	166	( 291 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	190	( 333 )
- MD		every roll	90	( 158 )	187	( 327 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		526
- MD	(51 mm)	every roll		150		523
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		16

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107805

## ROLL IDENTIFICATION

Roll Number 105107805  
 Product Name HDT060A000  
 Production Date 4/7/01

## RESIN INFORMATION

Lot Number 8210135  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,996 pounds  
 1,813 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	63	( 1.6 )
Minimum		every roll	54	( 1.4 )	57	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 295 )
- MD		every roll	130	( 228 )	171	( 299 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	211	( 369 )
- MD		every roll	90	( 158 )	185	( 324 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		554	
- MD	(51 mm)	every roll	150		507	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	63	( 280 )
- MD		every roll	42	( 187 )	63	( 280 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	104	( 463 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		16	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107808

## ROLL IDENTIFICATION

Roll Number 105107808  
 Product Name HDT060A000  
 Production Date 4/7/01

## RESIN INFORMATION

Lot Number 8210135  
 Type TR400GS  
 Supplier Phillips

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,940 pounds  
 1,787 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	176	( 309 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	204	( 358 )
- MD		every roll	90	( 158 )	213	( 372 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		518
- MD	(51 mm)	every roll		150		535
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	64	( 285 )
- MD		every roll	42	( 187 )	65	( 289 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	165	( 734 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		26

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 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107809

## ROLL IDENTIFICATION

Roll Number 105107809  
 Product Name HDT060A000  
 Production Date 4/7/01

## RESIN INFORMATION

Lot Number 8210135  
 Type TR400GS  
 Supplier Phillips

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,958 pounds  
 1,795 kilograms

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	174	( 304 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	197	( 345 )
- MD		every roll	90	( 158 )	195	( 342 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		18	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		523	
- MD	(51 mm)	every roll	150		503	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	58	( 258 )
- MD		every roll	42	( 187 )	66	( 294 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.4	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		16	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107810

## ROLL IDENTIFICATION

<b>Roll Number</b>	105107810	
<b>Product Name</b>	HDT060A000	
<b>Production Date</b>	4/7/01	
<b>Length</b> $\approx$ (+/- 1%)	520 feet 158 meters	
<b>Width</b> (Nominal)	22.5 feet 6.9 meters	
<b>Sheet Area</b>	11,700 sq. feet 1,086 sq. meters	
<b>Weight</b>	3,942 pounds 1,788 kilograms	

## RESIN INFORMATION

<b>Lot Number</b>	8210135
<b>Type</b>	TR400GS
<b>Supplier</b>	Phillips

## GSE RESIN TEST DATA

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 299 )
- MD		every roll	130	( 228 )	175	( 307 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	201	( 352 )
- MD		every roll	90	( 158 )	210	( 368 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		523
- MD	(51 mm)	every roll		150		532
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	63	( 280 )
- MD		every roll	42	( 187 )	63	( 280 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	165	( 734 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	99	( 441 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.4
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		15

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107885

## ROLL IDENTIFICATION

Roll Number 105107885  
 Product Name HDT060A000  
 Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,926 pounds  
 1,781 kilograms

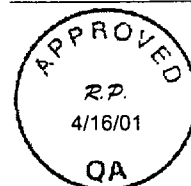
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 299 )
- MD		every roll	130	( 228 )	166	( 290 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	102	( 179 )
- MD		every roll	90	( 158 )	167	( 292 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		312
- MD	(51 mm)	every roll		150		483
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	55	( 245 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	146	( 650 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	106	( 472 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.945
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.6
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107889

## ROLL IDENTIFICATION

Roll Number 105107889  
 Product Name HDT060A000  
 Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,930 pounds  
 1,783 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	169	( 296 )
- MD		every roll	130	( 228 )	175	( 306 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	191	( 335 )
- MD		every roll	90	( 158 )	198	( 346 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		518	
- MD	(51 mm)	every roll	150		543	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		22	
Average (mils)						

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107890

## ROLL IDENTIFICATION

Roll Number	105107890	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,904 pounds 1,771 kilograms	

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

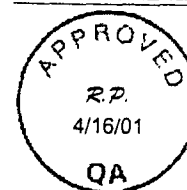
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	167	( 292 )
- MD		every roll	130	( 228 )	170	( 298 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	186	( 325 )
- MD		every roll	90	( 158 )	179	( 314 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		505	
- MD	(51 mm)	every roll	150		490	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	156	( 694 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height Average (mils)	GRI GM 12	every roll	10		21	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107891

## ROLL IDENTIFICATION

Roll Number 105107891  
 Product Name HDT060A000  
 Production Date 4/14/01

Length  $\approx$  (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,896 pounds  
 1,767 kilograms

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

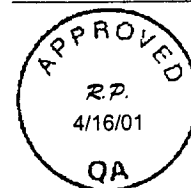
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	58	( 1.5 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	159	( 278 )
- MD		every roll	130	( 228 )	172	( 300 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	202	( 354 )
- MD		every roll	90	( 158 )	205	( 359 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		17
- MD	(33 mm)	every roll		13		17
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		555
- MD	(51 mm)	every roll		150		550
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	61	( 271 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	164	( 730 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.947
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.2
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A2
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596					
		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		19

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107892

## ROLL IDENTIFICATION

Roll Number	105107892	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx (+/- 1\%)$	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,894 pounds 1,766 kilograms	

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	62	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	177	( 310 )
- MD		every roll	130	( 228 )	167	( 293 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	166	( 291 )
- MD		every roll	90	( 158 )	168	( 293 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		17	
- MD	(33 mm)	every roll	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		445	
- MD	(51 mm)	every roll	150		487	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	57	( 254 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	148	( 659 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.2	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A2	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		21	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107894

## ROLL IDENTIFICATION

Roll Number	105107894	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx$ (+/- 1%)	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,876 pounds 1,758 kilograms	

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	164	( 288 )
- MD		every roll	130	( 228 )	142	( 248 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	159	( 278 )
- MD		every roll	90	( 158 )	162	( 283 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		414	
- MD	(51 mm)	every roll	150		481	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	52	( 231 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	150	( 668 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		19	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107895

## ROLL IDENTIFICATION

Roll Number	105107895	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx (+/- 1\%)$	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,872 1,756	pounds kilograms

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

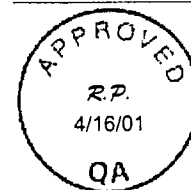
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	166	( 291 )
- MD		every roll	130	( 228 )	167	( 292 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	141	( 246 )
- MD		every roll	90	( 158 )	158	( 277 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		435	
- MD	(51 mm)	every roll	150		403	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	50	( 223 )
- MD		every roll	42	( 187 )	48	( 214 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	155	( 690 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12	every roll	10		18	
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107896

## ROLL IDENTIFICATION

Roll Number 105107896  
 Product Name HDT060A000  
 Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,888 pounds  
 1,764 kilograms

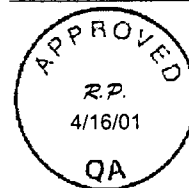
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	165	( 289 )
- MD		every roll	130	( 228 )	163	( 285 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	147	( 257 )
- MD		every roll	90	( 158 )	174	( 305 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		15	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		431	
- MD	(51 mm)	every roll	150		486	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	56	( 249 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	167	( 743 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015					
		every 5th	A2		A1	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		24	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107897

## ROLL IDENTIFICATION

Roll Number	105107897	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx (+/- 1\%)$	520 feet 158 meters	
Width (Nominal)	22.5 feet 6.9 meters	
Sheet Area	11,700 sq. feet 1,086 sq. meters	
Weight	3,898 pounds 1,768 kilograms	

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

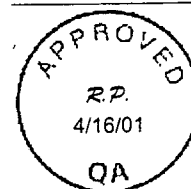
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	171	( 300 )
- MD		every roll	130	( 228 )	160	( 280 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	162	( 284 )
- MD		every roll	90	( 158 )	158	( 277 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		15
- MD	(33 mm)	every roll		13		16
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		478
- MD	(51 mm)	every roll		150		410
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	51	( 227 )
- MD		every roll	42	( 187 )	46	( 205 )
Puncture Resistance, lb. (N)	ASTM D 4833					
		every roll	108	( 478 )	147	( 654 )
Puncture Resistance, lb. (N)	FTMS 101C/2065					
		every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505					
		every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*					
		every 5th		2.0		2.3
Carbon Black Dispersion	ASTM D 3015					
		every 5th		A2		A1
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 5th		9		10
Asperity Height	GRI GM 12					
Average (mils)		every roll		10		26

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107898

## ROLL IDENTIFICATION

Roll Number 105107898  
 Product Name HDT060A000  
 Production Date 4/14/01

## RESIN INFORMATION

Lot Number 8210165  
 Type TR400GS  
 Supplier Phillips

## GSE RESIN TEST DATA

Length  $\pm$ (+/- 1%) 520 feet  
 158 meters  
 Width (Nominal) 22.5 feet  
 6.9 meters  
 Sheet Area 11,700 sq. feet  
 1,086 sq. meters  
 Weight 3,892 pounds  
 1,765 kilograms

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	60	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	181	( 317 )
- MD		every roll	130	( 228 )	178	( 311 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	131	( 229 )
- MD		every roll	90	( 158 )	188	( 328 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		305	
- MD	(51 mm)	every roll	150		505	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	55	( 245 )
- MD		every roll	42	( 187 )	58	( 258 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	157	( 699 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	108	( 481 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.3	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		16	

Order No. 20979  
 Customer Name PASCO COUNTY LANDFILL  
 Location DADE CITY, FLORIDA

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107899

## ROLL IDENTIFICATION

Roll Number	105107899	
Product Name	HDT060A000	
Production Date	4/14/01	
Length $\approx (+/- 1\%)$	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,906 1,772	pounds kilograms

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.5 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	175	( 306 )
- MD		every roll	130	( 228 )	170	( 297 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	164	( 288 )
- MD		every roll	90	( 158 )	179	( 313 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll		13		16
- MD	(33 mm)	every roll		13		18
Break Elongation, % - TD	gauge length = 2.0"	every roll		150		473
- MD	(51 mm)	every roll		150		480
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	57	( 254 )
- MD		every roll	42	( 187 )	56	( 249 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	160	( 712 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	113	( 503 )
Density, g/cc	ASTM D 1505	every 5th		0.940		0.946
Carbon Black Content, %	ASTM D 1603*	every 5th		2.0		2.5
Carbon Black Dispersion	ASTM D 3015	every 5th		A2		A1
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th		9		10
Asperity Height	GRI GM 12	every roll		10		19
Average (mils)						

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

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Lining Technology, Inc.

## Roll Test Data Report

Roll No. 105107900

## ROLL IDENTIFICATION

Roll Number	105107900
Product Name	HDT060A000
Production Date	4/14/01
Length $\approx$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,086 sq. meters
Weight	3,934 pounds 1,784 kilograms

## RESIN INFORMATION

Lot Number	8210165
Type	TR400GS
Supplier	Phillips

## GSE RESIN TEST DATA

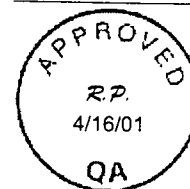
Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	( 1.5 )	61	( 1.6 )
Minimum		every roll	54	( 1.4 )	55	( 1.4 )
Tensile Properties:	ASTM D 638, Type IV					
Yield Strength, ppi (N/cm) - TD		every roll	130	( 228 )	184	( 322 )
- MD		every roll	130	( 228 )	182	( 319 )
Break Strength, ppi (N/cm) - TD		every roll	90	( 158 )	138	( 242 )
- MD		every roll	90	( 158 )	161	( 281 )
Yield Elongation, % - TD	gauge length = 1.3"	every roll	13		16	
- MD	(33 mm)	every roll	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every roll	150		480	
- MD	(51 mm)	every roll	150		400	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every roll	42	( 187 )	54	( 240 )
- MD		every roll	42	( 187 )	53	( 236 )
Puncture Resistance, lb. (N)	ASTM D 4833	every roll	108	( 478 )	158	( 703 )
Puncture Resistance, lb. (N)	FTMS 101C/2065	every 5th	80	( 356 )	113	( 503 )
Density, g/cc	ASTM D 1505	every 5th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 5th	2.0		2.5	
Carbon Black Dispersion	ASTM D 3015	every 5th	A2		A1	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 5th	9		10	
Asperity Height	GRI GM 12					
Average (mils)		every roll	10		16	

Order No. 20979  
Customer Name PASCO COUNTY LANDFILL  
Location DADE CITY, FLORIDA

\*Modified

GSE-4.10-007 Rev - - 07/00



Equistar Chemicals, LP  
Malagorda Plant  
13 Miles S. of Bay City-Hwy 60  
Bay City, TX 77414

## Certificate Of Analysis

DON BOHAC  
GSE LINING TECHNOLOGIES  
WESTFIELD TX 77060  
FAX No. : 281-230-8630

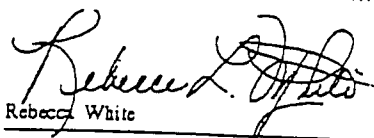
Customer Order No. : 18319-000-OP  
Customer Number : 7731  
Date Shipped : March 08, 2001  
Equistar Order No. : 387750 000010  
Delivery Item No. : 80490820 000010

Ship-To:  
GSE LINING TECHNOLOGY INC  
1340 E RICHEY RD  
WESTFIELD TX 77073  
UNITED STATES

Equistar Material : 7674 ALATHON XL3812  
Batch Number : MT21020421  
Estimated Quantity : 192,900 LBS

Test Description	Test Result	Unit of Measure	Inspection Method
Vehicle ID	EQUX631068		
Vehicle Type	HOPPER CAR		
Density @ 23C	0.940	g/cc	
Melt Flow, 2160g @ 190C	0.115	g/10 min.	

Approved by:

  
Rebecca White

Issue Date: March 14, 2001

Question ? Call Customer  
Service: 888-777-0232

This Certificate of Analysis contains the most current information available as of the issue date.  
This document shall not be reproduced except in full, without the written approval of the issuer.



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

January 26, 2001

PSN# 2226-01

FAX: 281-230-8630

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8201758
P.O. Number:	
Date Shipped:	01/26/01
Package:	PSPX 6680
Quantity:	187050 LBS.
Melt Index, ASTM D1238:	.080 G/10 MIN
HLMI Flow Rate, ASTM D1238:	11.5 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	144.
Production Date:	12/02/00
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	118.333

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 21, 2001

PSN# 4507-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below,  
as supplied by Chevron Phillips Chemical Company, conforms  
to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210135
P.O. Number:	-
Date Shipped:	02/16/01
Package:	PSPX 6470
Quantity:	186500 LBS.
Melt Index, ASTM D1238:	.07 G/10 MIN
HLMI Flow Rate, ASTM D1238:	10.0 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	10.0 G/10 MIN
Production Date:	02/08/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	145.250

Paul S. Newbold  
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



Houston Chemical Complex  
P.O. Box 792, Pasadena, TX 77501

February 16, 2001

PSN# 4086-01

FAX: 281-230-2510

GSE Lining Technology, Inc.  
19103 Gundle Road  
Houston, TX 77073

Don Bohac

This letter will certify that the Marlex\* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

Type:	HHM TR-400GS
Lot Number:	8210165
P.O. Number:	
Date Shipped:	02/16/01
Package:	PSPX 6547
Quantity:	179550 LBS.
Melt Index, ASTM D1238:	.070 G/10 MIN
HLMI Flow Rate, ASTM D1238:	10.1 G/10 MIN
Density, ASTM D1505:	.937 G/CC
HLMI/MI Ratio:	144.
Production Date:	02/13/01
ESCR, F/50, Cond. B:	1500 HOURS **
Brittleness Temperature:	<-70 C **
Color:	120.667

Paul S. Newbold  
Sr. Certification Systems Specialist

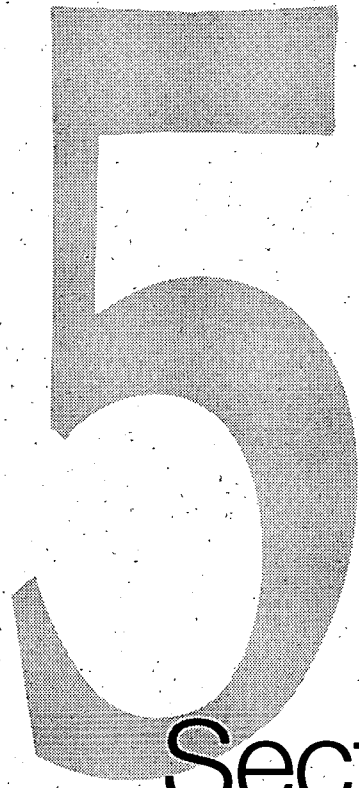
For COA questions call Carol Meza, 713-475-3625

\* Reg. U.S. Pat. Off.

\*\* Nominal Value (not tested on each lot)

cc: QA-File-RC

Milissa Mulkey  
FAX: 281-230-8630



# Section Five



**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02

Submittal Identifier:	<u>D-02274-007-A</u>	<input checked="" type="checkbox"/> Original Submittal	<input type="checkbox"/> Supplement
Submitted:	<u>February 13, 2002</u>	<input type="checkbox"/> Resubmittal	<input type="checkbox"/> Information Only
No. of Copies:	<u>8</u>		

Submittal Description: Geocomposite QA/QC Roll Certificates: Lot 1

Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)

Manufacturer: Tenax Corporation

Installer: COMANCO Environmental Corporation

**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:	<input type="checkbox"/> Code 1 - Approved	<input type="checkbox"/> Code 4 - Approved As Noted, Resubmit
	<input type="checkbox"/> Code 2 - Approved As Noted	<input type="checkbox"/> Code 5 - Not Approved
	<input type="checkbox"/> Code 3 - Approved As Noted, Confirm	<input type="checkbox"/> Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b>	<b>RESPONSE REQUIRED OF CONTRACTOR</b>
Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<small>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in the submittal or from the Contractor's responsibility of assessing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequence or procedures of construction and performing its work in a safe manner.</small>	
By <u>ATU</u> Date <u>3/1/02</u>	

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: December 17, 2001**

**Lot #1**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## **Table of Contents**

<b>Certification Letter and Product Specification .....</b>	<b>1</b>
<b>MQC of Geonet .....</b>	<b>2</b>
<b>MQC of Geotextile .....</b>	<b>3</b>
<b>MQC of Geocomposite.....</b>	<b>4</b>



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000

Order Line: (800) 356-8495

Fax: 410-522-7015

Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 1

December 17, 2001

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101039, 0101040, 0101041, 0101042, 0101043, 0101044, 0101045, 0101046, 0101047, 0101048, 0101049, 0101050, 0101051, 0101052, 0101053, 0101054, 0101055, 0101056, 0101057, 0101058, 0101059, 0101060, 0101061, 0101062, 0101063, 0101064, 0101065, 0101066, 0101067, 0101068, 0101069, 0101070, 0101071, 0101072, 0101073, 0101074, 0101075, 0101076, 0101077, 0101078, 0101079, 0101080, 0101081, 0101082, 0101083, 0101084, 0101085, 0101086, 0101087, 0101088, 0101089, 0101090, 0101091, 0101092, 0101093, 0101094, of Tendrain 7 70-2, consisting of lot # 1 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 1, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager

# TENDRAIN 770-2

## IBLE-SIDED GEOCOMPOSITE

Pasco LF, FL

rainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
Grab Elongation	ASTM D4632	%	50	b, Note 4
Grab Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
<u>Gradient/Load:</u>			<u>15,000 psf (720 kPa)</u>	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
c = Minimum Value    d = Maximum Value

### NOTES:

- Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
- Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in. x 4 in. specimen and a constant rate of strain of 0.04 in./min.
- Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
- Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
- Roll dimensions are measured at the time of manufacture.
- Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
- Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

**4800 East Monument Street  
Baltimore, Maryland 21205**

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: [www.tenaxus.com](http://www.tenaxus.com)

### Geonet MQC Test Results

**Product** TD 7  
**Project** Pasco Landfill  
**Lot #** 1  
**Dimensions** 6.7' x 200'  
**Testing Lab** Tenax Corp.

Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Unit Weight	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D3776-96 (g/m2)	ASTM D4595-94 (lb/ft)
0100325	11/28/2001	315	0.952	2.40	0.400	1625	1600
0100326	11/29/2001	305	0.952	2.37	0.350	1650	1656
0100328	11/30/2001	312	0.950	2.54	0.380	1803	1800
0100330	12/01/2001	320	0.955	2.44	0.510	1952	1820
0100333	12/01/2001	305	0.955	2.46	0.580	1850	—
0100337	12/02/2001	315	0.955	2.36	0.560	1780	1725
0100341	12/03/2001	312	0.950	2.50	0.400	1764	—

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Unit Weight ASTM D3776-96 (g/m2)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		312	0.953	2.44	0.454	1775	-
Standard Dev.		5	0.002	0.07	0.093	113	-
Specifications		300	0.940	2.00	< 1	1600	1000

#### Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100325	63.00	50
	0100326	65.00	50
	0100328	60.00	50
	0100330	59.00	50
	0100333	60.60	50
	0100337	59.10	50
	0100341	62.00	50
	Average (Specs)	61.24	50

Tested by

David Mitchell  
Lab Technician

Date

12/16/2001

Checked by

Tim Bauters, Ph.D.

Date

12/16/2001



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/25/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111036	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111037	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5





*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/25/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111039	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111040	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111041	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111042	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111043	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111044	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111045	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111046	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111047	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111048	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111049	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111050	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111051	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111052	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111053	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111054	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111057	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111058	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111059	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111060	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111061	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111062	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111063	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111064	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111065	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111066	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111067	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111068	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111069	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111070	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111071	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111072	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111073	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111074	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111075	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111076	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111077	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111078	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111079	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111080	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111081	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/25/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111082	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111083	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111198	6.7	92	197	220	94	123	125	114	124	355	0.212	2.0	0.5
130111199	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111200	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111201	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111281	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111282	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130111293	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111295	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111313	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4



# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	1
DATE:	12/14/2001

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101039	0100326	130111201	130111078	200
0101040	0100326	130111201	130111078	200
0101041	0100326	130111201	130111078	200
0101042	0100326	130111201	130111078	200
0101043	0100326	130111201	130111078	200
0101044	0100326	130111064	130111075	200
0101045	0100326	130111064	130111075	200
0101046	0100326	130111064	130111075	188
0101047	0100326	130111064	130111075	200
0101048	0100327	130111064	130111075	200
0101049	0100327	130111081	130111076	200
0101050	0100327	130111081	130111076	200
0101051	0100327	130111081	130111076	200
0101052	0100327	130111081	130111076	200
0101053	0100327	130111081	130111076	200
0101054	0100327	130111080	130111200	200
0101055	0100328	130111080	130111200	200
0101056	0100328	130111080	130111200	200
0101057	0100328	130111080	130111200	200
0101058	0100328	130111080	130111200	200
0101059	0100328	130111074	130111057	200
0101060	0100328	130111074	130111057	200
0101061	0100328	130111074	130111057	200
0101062	0100328	130111074	130111057	200
0101063	0100331	130111069	130111071	200
0101064	0100331	130111069	130111071	200
0101065	0100331	130111069	130111071	200
0101066	0100331	130111069	130111071	200
0101067	0100331	130111069	130111071	200
0101068	0100331	130111199	130111079	200
0101069	0100332	130111199	130111079	200
0101070	0100332	130111199	130111079	200
0101071	0100332	130111199	130111079	200
0101072	0100332	130111199	130111079	200
0101073	0100332	130111198	130111083	200
0101074	0100335	130111198	130111083	200
0101075	0100335	130111198	130111083	190
0101076	0100335	130111198	130111083	200
0101077	0100335	130111198	130111083	200
0101078	0100335	130111082	130111068	200
0101079	0100335	130111082	130111068	200
0101080	0100335	130111082	130111068	200
0101081	0100335	130111082	130111068	200
0101082	0100335	130111082	130111068	200
0101083	0100334	130111067	130111073	200
0101084	0100334	130111067	130111073	200
0101085	0100334	130111067	130111073	200
0101086	0100334	130111067	130111073	200
0101087	0100334	130111067	130111073	111
0101088	0100334	130111065	130111062	200
0101089	0100334	130111065	130111062	200
0101090	0100334	130111065	130111062	200
0101091	0100334	130111065	130111062	200
0101092	0100338	130111065	130111062	200
0101093	0100338	130111072	130111046	200
0101094	0100338	130111072	130111046	200



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: www.tenaxus.com

## Peel Strength Geocomposite Testing Report

### ASTM F904\*

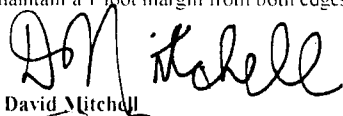
Product Tendrain 770-2  
Lot : 1  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101039	12/16/2001	1.10	1.04	
		1.28	1.33	
		1.18	1.09	
		1.45	1.11	
		1.37	1.25	
		1.28	1.16	Average
		0.14	0.12	Std. Deviation
		1.00	1.00	Specification (minimum)

Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

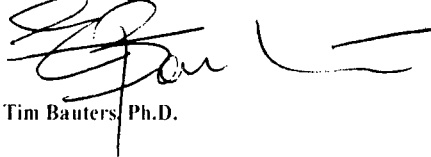
\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min., for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

  
David Mitchell

Date 12/16/2001

Checked by

  
Tim Bauters, Ph.D.

Date 12/16/2001



## Precision Geosynthetic Laboratories

December 5, 2001

ISO 9002



Mr. David Mitchell  
**TENAX CORPORATION**  
4800 E Monument Street  
Baltimore, MD 21205

Dear Mr. Mitchell:

RE: PASCO LANDFILL

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.


The test data and all associated project information shall be held in confidence and disclosed to other parties only with the authorization of Client or Precision Geosynthetic Laboratories.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. **Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

**PRECISION GEOSYNTHETIC LABORATORIES**

  
Edith Pintor  
Quality Assurance

Cora B. Queja  
Vice President

Enclosure: (Job No. 011246)



# Precision Geosynthetic Laboratories

CLIENT: TENAX CORPORATION  
PROJECT: PASCO LANDFILL

VERIFICATION OF MATERIAL PROPERTIES  
(PGL Job No. 011246)

ISO 9002



MATERIAL DESCRIPTION: Geocomposite, TENDRAIN 770-2

DATE RECEIVED: December 1, 2001

DATE REPORTED: December 5, 2001

SAMPLE IDENTIFICATIONS:

**SAMPLE ID**

**PRECISION CONTROL NUMBER**

Lot No. 1

73695

TESTS REQUIRED:

**TEST METHOD**

**DESCRIPTION**

ASTM D4716

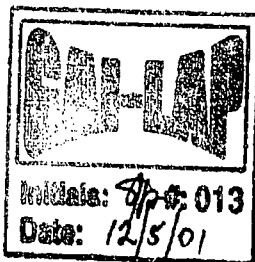
Transmissivity

TEST CONDITIONS: The sample was conditioned for a minimum one hour in the laboratory at  $22 \pm 2^{\circ}\text{C}$  ( $71.6 \pm 3.6^{\circ}\text{F}$ ) and at  $60 \pm 10\%$  relative humidity prior to test.

TEST RESULTS:

The test results are summarized in Table 1. The units in which the data are reported are included on the table.

**PRECISION GEOSYNTHETIC LABORATORIES**



Edith Pintor  
Quality Assurance

Cora B. Queja  
Vice President

**TABLE 1.**  
**MATERIAL PROPERTIES**  
**CLIENT: TENAX CORPORATION**  
**PROJECT: PASCO LANDFILL**

Date Received: 12/1/01  
 Date Final Reported: 12/5/01  
 Client Sample ID: Lot No. 1  
 Material Description: **Geocomposite, TENDRAIN 770-2**

QC'd By: 4m  
 PGL Job No.: 011246  
 PGL Control No.: 73695

		SPECIMENS										Avg.	Std. Dev.	Proj. Specs.
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10			
<u><b>Geocomposite:</b></u>														
ASTM D4716	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 1 hr)													
MD	3.04											3.04	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 24 hrs)													
MD	2.99											2.99	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 48 hrs)													
MD	2.79											2.79	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 72 hrs)													
MD	2.74											2.74	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 96 hrs)													
MD	2.70											2.70	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec) (Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 100 hrs)													
MD	2.69											2.69	N/A	
<u><b>** Geosynthetics arranged as follows:</b></u>														
	Plate													
	Ottawa Sand	+++++++												
	Geocomposite	XXXXXXXXX												
	60 mil HDPE Liner	+++++++												
	Plate													

Thickness, avg. = 420 mils  
 Thickness, avg. = 351 mils

MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION



**Precision Geosynthetic Laboratories**

ISO 9002



## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02Submittal Identifier: D-02274-008-A☒ Original Submittal☐ SupplementSubmitted: February 13, 2002No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: Geocomposite QA/QC Roll Certificates: Lot 2Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)Manufacturer: Tenax CorporationInstaller: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status: ☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

## SHOP DRAWING REVIEW

## ENGINEER'S REVIEW

Approved ☒ Not Approved ☐  
 Approved as Noted ☐ Comments Attached ☐

## RESPONSE REQUIRED OF CONTRACTOR

Confirm ☐  
 Resubmit ☐

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, dimensions of procedures of construction and performing his work in a safe manner.  
 CAMP DRESSER & MCKEE INC.

By AMSDate 3/1/02

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: December 17, 2001**

**Lot # 2**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## Table of Contents

Certification Letter and Product Specification .....	1
MQC of Geonet .....	2
MQC of Geotextile .....	3
MQC of Geocomposite.....	4





Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000  
Fax: 410-522-7015

Order Line: (800) 356-8495  
Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 2

December 17, 2001

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101114, 0101115, 0101116, 0101117, 0101118, 0101119, 0101120, 0101121, 0101122, 0101123, 0101124, 0101125, 0101126, 0101127, 0101128, 0101129, 0101130, 0101131, 0101132, 0101133, 0101134, 0101135, 0101136, 0101137, 0101138, 0101139, 0101140, 0101141, 0101142, 0101143, 0101144, 0101145, 0101146, 0101147, 0101148, 0101149, 0101150, 0101151, 0101152, 0101153, 0101154, 0101155, 0101156, 0101157, 0101158, 0101159, 0101160, 0101161, 0101162, 0101163, 0101164, 0101165, 0101166, 0101167, 0101168, 0101169, of Tendrain 7 70-2, consisting of lot # 2 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 2, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Tim Bauters", with a stylized flourish at the end.

Tim Bauters, Ph.D.  
Quality Control Manager

# TENDRAIN 770-2

## UNIDIRECTIONAL GEOTEXTILE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
Grab Elongation	ASTM D4632	%	50	b, Note 4
Initial Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
Gradient/Load:			15,000 psf (720 kPa)	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
 c = Minimum Value    d = Maximum Value

### NOTES:

- Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
- Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
- Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
- Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
- Roll dimensions are measured at the time of manufacture.
- Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
- Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

**4800 East Monument Street  
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Web Site: [www.tenaxus.com](http://www.tenaxus.com)

### Geonet MQC Test Results

**Product** TD 7  
**Project** Pasco Landfill  
**Lot #** 2  
**Dimensions** 6.7' x 200'  
**Testing Lab** Tenax Corp.

Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Unit Weight	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D3776-96 (g/m2)	ASTM D4595-94 (lb/ft)
0100337	12/02/2001	315	0.955	2.36	0.560	1780	1725
0100341	12/03/2001	312	0.950	2.50	0.400	1764	-
0100353	12/05/2001	320	0.952	2.44	0.550	1650	1688
0100356	12/06/2001	323	0.950	2.63	0.300	1765	1795
0100359	12/07/2001	303	0.952	2.57	0.340	1691	1397
0100363	12/08/2001	335	0.955	2.44	0.420	-	1650

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Unit Weight ASTM D3776-96 (g/m2)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		318	0.952	2.49	0.428	—	—
Standard Dev.		11	0.002	0.10	0.107	—	—
Specifications		300	0.940	2.00	< 1	1600	1000

Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100337	59.10	50
	0100341	62.00	50
	0100353	58.00	50
	0100356	60.00	50
	0100359	61.00	50
	0100363	58.00	50
	Average (Specs)	59.68	50

by

David Mitchell

Date

12/17/2001

Checked by

Tim Bauters, Ph.D.

Date

12/17/2001



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/25/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111036	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111037	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5



*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/25/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/lyd2)	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111039	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111040	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111041	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111042	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111043	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111044	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111045	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111046	7.7	108	227	252	95	120	170	137	139	398	0.212	2.0	0.5
130111047	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111048	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111049	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111050	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111051	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111052	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111053	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5
130111054	7.7	108	236	274	106	116	134	155	145	388	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111057	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111058	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111059	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111060	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111061	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111062	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111063	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111064	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111065	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111066	6.6	91	203	207	89	121	101	110	116	350	0.212	2.0	0.5
130111067	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111068	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111069	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111070	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111071	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111072	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111073	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111074	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111075	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111076	6.3	95	202	237	97	117	90	141	119	350	0.212	2.0	0.5
130111077	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111078	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111079	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111080	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111081	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product : NW6*

*Item Code: FBR0608100*

*Roll Width: 15.0 feet*

*Test Date: 11/25/2*

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-l)</i>	<i>(cm/sec)</i>
130111082	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111083	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/lyd2)	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111198	6.7	92	197	220	94	123	125	114	124	355	0.212	2.0	0.5
130111199	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111200	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111201	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111281	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111282	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111293	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130111295	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product : NW6*

*Item Code: FBR0608100*

*Roll Width: 15.0 feet*

*Test Date: 11/27/2*

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111313	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	2
DATE:	12/14/01

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101114	0100339	130111048	130111063	200
0101115	0100339	130111048	130111063	200
0101116	0100339	130111048	130111063	200
0101117	0100339	130111048	130111063	200
0101118	0100339	130111049	130111047	200
0101119	0100339	130111049	130111047	200
0101120	0100340	130111049	130111047	200
0101121	0100340	130111049	130111047	200
0101122	0100340	130111042	130111050	200
0101123	0100340	130111042	130111050	200
0101124	0100340	130111042	130111050	200
0101125	0100341	130111042	130111050	200
0101126	0100341	130111042	130111050	200
0101127	0100341	130111040	130111052	200
0101128	0100341	130111040	130111052	200
0101129	0100341	130111040	130111052	200
0101130	0100341	130111040	130111052	200
0101131	0100341	130111040	130111052	200
0101132	0100341	130111040	130111052	200
0101133	0100341	130111045	130111053	191
0101134	0100353	130111053	130111045	200
0101135	0100353	130111053	130111045	150
0101136	0100353	130111053	130111045	200
0101137	0100353	130111053	130111045	200
0101138	0100353	130111041	130111295	200
0101139	0100353	130111041	130111295	200
0101140	0100354	130111041	130111295	200
0101141	0100354	130111041	130111295	200
0101142	0100354	130111041	130111295	200
0101143	0100354	130111036	130111293	200
0101144	0100354	130111036	130111293	200
0101145	0100354	130111036	130111293	200
0101146	0100354	130111036	130111293	200
0101147	0100354	130111036	130111293	200
0101148	0100355	130111039	130111044	200
0101149	0100355	130111039	130111044	200
0101150	0100355	130111039	130111044	200
0101151	0100355	130111039	130111044	200
0101152	0100355	130111039	130111044	200
0101153	0100356	130111313	130111370	200
0101154	0100356	130111313	130111370	200
0101155	0100356	130111313	130111370	200
0101156	0100356	130111313	130111370	200
0101157	0100356	130111037	130111281	132
0101158	0100357	130111037	130111281	200
0101159	0100357	130111037	130111281	200
0101160	0100357	130111037	130111281	200
0101161	0100357	130111037	130111281	200
0101162	0100357	130111037	130111281	200
0101163	0100357	130111043	130111051	200
0101164	0100357	130111043	130111051	200
0101165	0100357	130111043	130111051	200
0101166	0100357	130111043	130111051	200
0101167	0100361	130111043	130111051	200
0101168	0100361	130111054	130111282	200
0101169	0100361	130111054	130111282	200



Corporation

**4800 East Monument Street  
Baltimore, Maryland 21205**

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Waste Mgt: (800) US-GRIDS

Web Site: [www.tenaxus.com](http://www.tenaxus.com)**Peel Strength Geocomposite Testing Report**

ASTM F904\*

**Product** Tendrain 770-2  
**Lot :** 2  
**Roll Size** 6.7' x 200'  
**Project** Pasco Landfill  
**Testing Lab** Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101114	12/05/2001	1.33	1.12	
		1.25	1.17	
		1.41	1.30	
		1.58	1.23	
		1.10	1.50	
		<b>1.33</b>	<b>1.26</b>	<b>Average</b>
		<b>0.18</b>	<b>0.15</b>	<b>Std. Deviation</b>
		<b>1.00</b>	<b>1.00</b>	<b>Specification (minimum)</b>

\*note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min., for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

David Mitchell

Date 12/16/2001

Checked by

Tim Bafters, Ph.D.

Date 12/16/2001



**TRI/ENVIRONMENTAL, INC.**  
A Texas Research International Company

**GEOCOMPOSITE TEST RESULTS**  
**Hydraulic Transmissivity (ASTM D 4716)**  
**Client: Tenax Corporation**  
**Project: Pasco Landfill**

TRI Log No.: E2160-80-07

Test Date: 12/06-11/01

Report Date: 12/11/01

Material: double sided geocomposite

Fluid Media: Water

Confining Pressure (psf): 15,000

Direction Tested: Machine Dir.

**Sample ID: Lot #2**

Trial Number	Normal Load Time (hours)	Hydraulic Gradient	Flow Rate (ml/sec)	Flow Rate/Unit Width (gpm/ft width)	Transmissivity (m <sup>2</sup> /s)
1	1	0.10	78.2	1.24	2.6E-03
2	1	0.10	76.9	1.22	2.5E-03
3	1	0.10	77.5	1.23	2.5E-03
Avg.			77.6	1.23	2.5E-03
Std. Dev.			0.65	0.01	2.1E-05

Transmissivity Box Configuration:  
(top to bottom)

Steel Plate  
Sand  
Sample  
60 mil HDPE geomembrane  
Steel Plate

SRA 12-11-01  
Quality Review / Date

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without approval of TRI.





**TRI/ENVIRONMENTAL, INC.**  
A Texas Research International Company

**GEOCOMPOSITE TEST RESULTS**  
Hydraulic Transmissivity (ASTM D 4716)  
Client: Tenax Corporation  
Project: Pasco Landfill

TRI Log No.: E2160-80-07

Test Date: 12/05/11/01

Report Date: 12/11/01

Material: double sided geocomposit

Fluid Media: Water

Confining Pressure (psf): 15,000

Direction Tested: Machine On

Sample ID: Lot #2

Trial Number	Normal Load		Flow Rate (ml/sec)	Flow Rate/Unit Width (gpm/ft width)	Transmissivity (mD-ft)
	Time (hours)	Hydraulic Gradient			
1	24	0.10	66.6	1.06	2.2E-03
2	24	0.10	68.2	1.08	2.2E-03
3	24	0.10	66.9	1.04	2.2E-03
Avg			67.0	1.05	2.2E-03
Std. Dev			1.18	0.02	1.8E-05

Transmissivity Box Configuration  
(top to bottom):

Steel Plate  
Sand  
Sample  
60 mil HDPE geotextile fabric  
Steel Plate

SPR-12-11-01  
Quality Review Date

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**TRI/ENVIRONMENTAL, INC.**

A Texas Research International Company

**GEOCOMPOSITE TEST RESULTS****Hydraulic Transmissivity (ASTM D 4716)****Client: Tenax Corporation****Project: Pasco Landfill**

TRI Log No.: E2160-80-07

Test Date: 12/06-11/01

Report Date: 12/11/01

Material: double sided geocomposite

Fluid Media: Water

Confining Pressure (psf): 15,000

Direction Tested: Machine Dir

**Sample ID: Lot #2**

Trial Number	Normal Load Time (hours)	Hydraulic Gradient	Flow Rate (ml/sec)	Flow Rate/Unit Width (gpm/ft width)	Transmissivity (m2/s)
1	78	0.10	65.9	1.04	2.2E-03
2	78	0.10	65.5	1.04	2.1E-03
3	78	0.10	64.3	1.02	2.1E-03
Avg.			65.2	1.03	2.1E-03
Std. Dev.			0.83	0.01	2.7E-05

Transmissivity Box Configuration:  
(top to bottom)Steel Plate  
Sand  
Sample  
60 mil HDPE geomembrane  
Steel PlateSRA 12-11-01  
Quality Review / Date

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**TRI/ENVIRONMENTAL, INC.***A Texas Research International Company***GEOCOMPOSITE TEST RESULTS**  
**Hydraulic Transmissivity (ASTM D 4716)****Client: Tenax Corporation****Project: Pasco Landfill**

TRI Log No.: E2160-80-07

Test Date: 12/06-11/01

Report Date: 12/11/01

Material: double sided geocomposite

Fluid Media: Water

Confining Pressure (psf): 15,000

Direction Tested: Machine Dir.

**Sample ID: Lot #2**

Trial Number	Normal Load Time (hours)	Hydraulic Gradient	Flow Rate (ml/sec)	Flow Rate/Unit Width (gpm/ft width)	Transmissivity (m <sup>2</sup> /s)
1	96	0.10	55.8	0.88	1.8E-03
2	96	0.10	56.9	0.90	1.9E-03
3	96	0.10	56.4	0.89	1.9E-03
Avg.			56.4	0.89	1.8E-03
Std. Dev.			0.55	0.01	1.8E-05

Transmissivity Box Configuration:  
(top to bottom)Steel Plate  
Sand  
Sample  
60 mil HDPE geomembrane  
Steel PlateSRA 12.11.01  
Quality Review / Date

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**GEOCOMPOSITE TEST RESULTS**  
**Hydraulic Transmissivity (ASTM D 4716)**  
**Client: Tenax Corporation**  
**Project: Pasco Landfill**

TRI Log No.: E2160-80-07  
Test Date: 12/06-11/01  
Report Date: 12/11/01

Material: double sided geocomposite  
Fluid Media: Water  
Confining Pressure (psf): 15,000  
Direction Tested: Machine Dir.

**Sample ID: Lot #2**

Trial Number	Normal Load		Hydraulic Gradient	Flow Rate (ml/sec)	Flow Rate/Unit Width (gpm/ft width)	Transmissivity (m <sup>2</sup> /s)
	Time (hours)					
1	100		0.10	54.9	0.87	1.8E-03
2	100		0.10	55.5	0.88	1.8E-03
3	100		0.10	55.6	0.88	1.8E-03
Avg.				55.3	0.88	1.8E-03
Std. Dev.				0.38	0.01	1.2E-05

Transmissivity Box Configuration:  
(top to bottom)

Steel Plate  
Sand  
Sample  
60 mil HDPE geomembrane  
Steel Plate

SEA 12-11-01  
Quality Review / Date

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## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02Submittal Identifier: D-02274-009-A☒ Original Submittal☐ SupplementSubmitted: February 13, 2002No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: Geocomposite QA/QC Roll Certificates: Lot 3Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)Manufacturer: Tenax CorporationInstaller: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b> Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	<b>RESPONSE REQUIRED OF CONTRACTOR</b> Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of eliminating any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing the work in a safe manner.</p> <p>CAMP DRESSER &amp; MCKEE INC.</p>	
By <u>AMS</u>	Date <u>3/1/02</u>

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: December 20, 2001**

**Lot # 3**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## **Table of Contents**

<b>Certification Letter and Product Specification.....</b>	<b>1</b>
<b>MQC of Geonet .....</b>	<b>2</b>
<b>MQC of Geotextile .....</b>	<b>3</b>
<b>MQC of Geocomposite.....</b>	<b>4</b>



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000  
Fax: 410-522-7015

Order Line: (800) 356-8495  
Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 3

December 20, 2001

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101189, 0101190, 0101191, 0101192, 0101193, 0101194, 0101195, 0101196, 0101197, 0101198, 0101199, 0101200, 0101201, 0101202, 0101203, 0101204, 0101205, 0101206, 0101207, 0101208, 0101209, 0101210, 0101211, 0101212, 0101213, 0101214, 0101215, 0101216, 0101217, 0101218, 0101219, 0101220, 0101221, 0101222, 0101223, 0101224, 0101225, 0101226, 0101227, 0101228, 0101229, 0101230, 0101231, 0101232, 0101233, 0101234, 0101235, 0101236, 0101237, 0101238, 0101239, 0101240, 0101241, 0101242, 0101243, 0101244, 0101245, 0101246, 0101247, 0101248, 0101249, 0101250, 0101251, 0101252, 0101253, 0101254, 0101255, 0101256, 0101257, 0101258, 0101259, 0101260, 0101261, 0101262, of Tendrain 7 70-2, consisting of lot # 3 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:  
Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 3, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager



# TENDRAIN 770-2

## UBLE-SIDED GEOCOMPOSITE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
Grab Elongation	ASTM D4632	%	50	b, Note 4
on Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
Uv Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
Gradient/Load:			15,000 psf (720 kPa)	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
 c = Minimum Value    d = Maximum Value

### NOTES:

1. Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
5. Roll dimensions are measured at the time of manufacture.
6. Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
7. Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

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Baltimore, Maryland 21205

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Fax: (410) 522-7015

Waste Mgt: (800) US-GRIDS

Web Site: www.tenaxus.com

### Geonet MQC Test Results

Product TD 7  
Project Pasco Landfill  
Lot # 3  
Dimensions 6.7' x 200'  
Testing Lab Tenax Corp.


Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D4595-94 (lb/ft)
0100363	12/08/2001	335	0.955	2.44	0.420	1650
0100367	12/09/2001	315	0.954	2.40	0.500	1580
0100369	12/10/2001	334	0.951	2.59	0.700	1680
0100372	12/10/2001	324	0.953	3.47	0.400	1800
0100375	12/11/2001	329	0.951	2.70	" 2P	1632
0100377	12/12/2001	342	0.951	2.88	"	1704
0100380	12/13/2001	338	0.951	2.75	0.450	1688
0100383	12/13/2001	330	0.952	2.44	0.400 2P	1502
0100386	12/13/2001	329	0.952	2.50	"	1488

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		331	0.952	2.69	0.319	1635
Standard Dev.		8	0.001	0.34	—	100
Specifications		300	0.940	2.00	< 1	1000

#### Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100363	58.00	50
	0100367	56.60	50
	0100369	57.00	50
	0100372	58.00	50
	0100375	51.00	50
	0100377	54.00	50
	0100377	57.00	50
	0100380	55.00	50
	0100383	55.00	50
	0100386	54.00	50
	Average (Specs)	55.56	50

Tested by

  
Antonello Capalozza

Date

12/19/2001

Checked by

  
David Mitchell

Date

12/19/2001



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/14/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106113	6.7	96	189	224	111	115	84	125	131	336	0.180	1.5	
130106114	6.7	96	189	224	111	115	84	125	131	336	0.180	1.5	
130106115	6.7	96	189	224	111	115	84	125	131	336	0.180	1.5	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/14/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130106119	6.7	96	189	224	111	115	84	125	131	336	0.180	1.5	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 9/14/20

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity Permeability</i>	
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130106125	6.6	87	189	221	109	119	99	118	122	335	0.180	1.5	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/14/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106129	6.6	87	189	221	109	119	99	118	122	335	0.180	1.5	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/14/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130106131	6.6	87	189	221	109	119	99	118	122	335	0.180	1.5	





**GSE**  
GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/14/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106134	6.5	92	204	225	112	123	94	121	121	335	0.180	1.5	



**GSE**  
*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 9/15/20

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity Permeability</i>	
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130106146	6.5	92	204	225	112	123	94	121	121	335	0.180	1.5	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 9/19/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106148	6.5	92	204	225	112	123	94	121	121	335	0.180	1.5	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 9/15/20

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity Permeability</i>	
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130106155	6.5	112	176	204	115	118	120	188	120	352	0.180	1.5	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130106159	6.7	82	215	234	90	102	144	148	128	352	0.212	2.1	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

- Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106161	6.7	82	215	234	90	102	144	148	128	352	0.212	2.1	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106169	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	
130106170	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	
130106171	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	
130106172	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	
130106173	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130106175	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	
130106176	6.7	88	192	223	100	116	127	160	120	348	0.212	2.1	





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130106181	6.3	91	186	205	97	113	124	183	121	330	0.212	2.1	
130106182	6.3	91	186	205	97	113	124	183	121	330	0.212	2.1	
130106183	6.3	91	186	205	97	113	124	183	121	330	0.212	2.1	
130106184	6.3	91	186	205	97	113	124	183	121	330	0.212	2.1	
130106185	6.3	91	186	205	97	113	124	183	121	330	0.212	2.1	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 9/15/20

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130106194	6.8	90	220	209	99	112	79	108	122	338	0.212	2.1	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106225	6.4	84	209	201	97	109	82	105	120	332	0.212	1.6	
130106226	6.4	84	209	201	97	109	82	105	120	332	0.212	1.6	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106233	6.7	87	218	234	95	110	91	108	120	354	0.212	1.6	
130106234	6.7	87	218	234	95	110	91	108	120	354	0.212	1.6	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632 MD (lbs) CD (lbs)		ASTM D 4632 MD (%) CD (%)		ASTM D 4533 MD (lbs) CD (lbs)		ASTM D 4833 (lbs)	ASTM D 3786 (psi)	ASTM D 4751 (mm)	ASTM D 4491 (sec-1)	ASTM D 4491 (cm/sec)
130106237	6.7	87	218	234	95	110	91	108	120	354	0.212	1.6	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130106242	6.8	87	209	232	102	114	86	110	120	357	0.212	1.6	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 9/15/20

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130106262	6.5	93	193	204	102	115	142	187	115	350	0.212	1.6	



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111223	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5





GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 9/23/20

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130106839	6.7	86	207	221	103	108	98	115	112	332	0.212	1.9	



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111202	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111203	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111204	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111205	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5
130111206	6.5	87	204	208	107	121	114	150	121	349	0.212	2.0	0.5



*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

**Product :** NW6

**Item Code:** FBR0608100

**Roll Width:** 15.0 feet

**Test Date:** 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd2)	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111209	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111210	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111211	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111212	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111213	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111214	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111215	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111216	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111217	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111218	6.6	96	216	246	90	118	87	124	117	352	0.212	2.0	0.5
130111219	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5
130111220	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5
130111221	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5
130111222	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	3
DATE:	12/14/01

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101189	0100364	130111216	130106194	200
0101190	0100364	130111216	130106194	200
0101191	0100364	130111215	130106194	200
0101192	0100364	130111215	130106194	200
0101193	0100364	130111215	130106194	200
0101194	0100364	130111215	130111217	200
0101195	0100364	130111215	130111217	200
0101196	0100364	130111219	130111217	200
0101197	0100364	130111219	130111217	182
0101198	0100365	130111219	130111217	200
0101199	0100365	130111219	130111217	200
0101200	0100365	130111219	130111204	200
0101201	0100365	130106125	130111204	200
0101202	0100365	130106125	130111204	200
0101203	0100365	130106125	130111204	200
0101204	0100365	130106125	130111212	200
0101205	0100366	130106125	130111212	200
0101206	0100366	130106125	130111212	200
0101207	0100366	130111221	130111212	200
0101208	0100366	130111221	130111212	200
0101209	0100366	130111221	130111213	200
0101210	0100366	130111221	130111213	200
0101211	0100366	130111221	130111213	200
0101212	0100366	130106175	130111213	200
0101213	0100366	130106175	130111213	185
0101214	0100367	130106175	130111209	200
0101215	0100367	130106175	130111209	200
0101216	0100367	130106175	130111209	200
0101217	0100367	130111214	130111209	200
0101218	0100367	130111214	130111209	200
0101219	0100367	130111214	130111222	200
0101220	0100367	130111214	130111222	200
0101221	0100367	130111214	130111222	200
0101222	0100368	130111205	130111222	200
0101223	0100368	130111205	130111222	200
0101224	0100368	130111205	130111203	200
0101225	0100368	130111205	130111203	200
0101226	0100368	130111205	130111203	200
0101227	0100368	130111220	130111203	200
0101228	0100368	130111220	130111203	200
0101229	0100368	130111220	130111206	200
0101230	0100368	130111220	130111206	200
0101231	0100369	130111220	130111206	200
0101232	0100369	130111202	130111206	200
0101233	0100369	130111202	130111206	200
0101234	0100369	130111202	130111211	200

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	3
DATE:	12/14/01

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101235	0100369	130111202	130111211	200
0101236	0100369	130111202	130111211	200
0101237	0100369	130111210	130111211	200
0101238	0100369	130111210	130111211	200
0101239	0100369	130111210	130106262	194
0101240	0100369	130111210	130106262	200
0101241	0100371	130111210	130106262	200
0101242	0100371	130106171	130106262	200
0101243	0100371	130106171	130106262	200
0101244	0100371	130106171	130106134	200
0101245	0100371	130106171	130106134	200
0101246	0100372	130106171	130106134	200
0101247	0100372	130111126	130106134	200
0101248	0100372	130111126	130106134	200
0101249	0100372	130111126	130111163	200
0101250	0100372	130111126	130111163	200
0101251	0100372	130111126	130111163	200
0101252	0100372	130111086	130111163	200
0101253	0100372	130111086	130111163	200
0101254	0100372	130111086	130111182	200
0101255	0100384	130111120	130111100	200
0101256	0100384	130111120	130111100	200
0101257	0100384	130111120	130111100	200
0101258	0100384	130111120	130111100	200
0101259	0100384	130111120	130111100	200
0101260	0100384	130111141	130111103	200
0101261	0100384	130111141	130111103	200
0101262	0100384	130111141	130111103	200



Corporation

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Baltimore, Maryland 21205

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Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS

Web Site: [www.tenaxus.com](http://www.tenaxus.com)

## Peel Strength Geocomposite Testing Report

ASTM F904\*

Product Tendrain 770-2  
Lot : 3  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101189	12/16/2001	1.11	1.02	
		1.37	1.15	
		1.25	1.08	
		1.51	1.22	
		1.60	1.31	
		1.37	1.16	Average
		0.20	0.11	Std. Deviation
		1.00	1.00	Specification (minimum)

\*Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min., for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

David Mitchell

Date 12/19/2001

Checked by

Tim Batters, Ph.D.

Date 12/19/2001

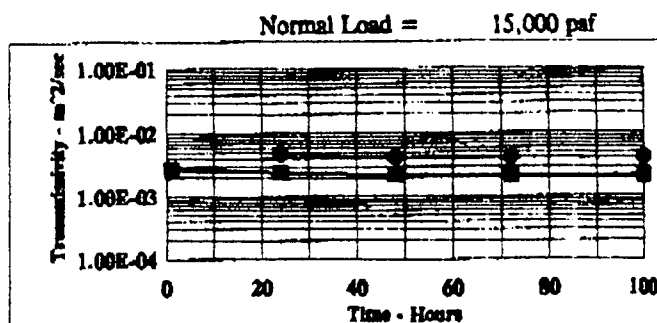
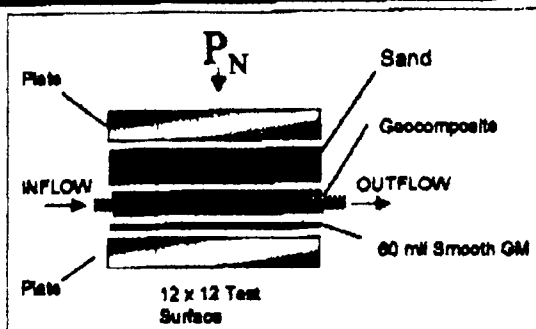
# TRANSMISSIVITY TEST RESULTS

## ASTM D-4716

**JLT**

Client: Tenax Corporation  
Project: Pasco Landfill  
Material: Tendrain 770-2  
Sample ID: Lot 3

Job Number: 01G2769-02  
Date: 12/14/01  
Tested By: MLB  
Checked By: JB



REPLICATE No.	GRADIENT	VOLUME cc	TIME sec	FLOW RATE cc/sec	TRANSMISSIVITY m²/sec	TRANSMISSIVITY gal/min/ft
1 Hour		Test Water Temp. =		17.3	Temp. Cor. Fact =	1.071
1	0.10	2416.00	30.28	79.79	2.80E-03	1.35
2	0.10	2466.00	30.82	80.01	2.81E-03	1.36
3	0.10	2454.00	30.72	79.88	2.81E-03	1.36
Average					2.81E-03	1.36
24 Hours		Test Water Temp. =		16.9	Temp. Cor. Fact =	1.082
1	0.10	2147.00	30.69	69.96	2.48E-03	1.20
2	0.10	2169.00	30.88	70.24	2.49E-03	1.20
3	0.10	2119.00	30.20	70.17	2.49E-03	1.20
Average					2.49E-03	1.20
24 Hours		Test Water Temp. =		17.3	Temp. Cor. Fact =	1.071
1	0.02	1129.00	40.25	28.05	4.93E-03	0.48
2	0.02	1119.00	40.18	27.85	4.89E-03	0.47
3	0.02	1122.00	40.23	27.89	4.90E-03	0.47
Average					4.91E-03	0.47
48 Hours		Test Water Temp. =		15.2	Temp. Cor. Fact =	1.131
1	0.10	1796.00	30.71	58.48	2.17E-03	1.05
2	0.10	1805.00	30.94	58.34	2.16E-03	1.05
3	0.10	1797.00	30.70	58.53	2.17E-03	1.05
Average					2.17E-03	1.05
48 Hours		Test Water Temp. =		15.2	Temp. Cor. Fact =	1.131
1	0.02	899.00	40.20	22.36	4.15E-03	0.40
2	0.02	915.00	40.35	22.68	4.21E-03	0.41
3	0.02	922.00	41.01	22.48	4.17E-03	0.40
Average					4.18E-03	0.40

**J&L Testing Company, Inc.**

938 S. Central Ave., Canonsburg, Pa. Tel: 724-746-4441 : Fax: 724-745-4261

# TRANSMISSIVITY TEST RESULTS

## ASTM D-4716

**JLT**

Client: Tenax Corporation  
Project: Pasco Landfill  
Material: Tendrain 770-2  
Sample ID: Lot 3

Job Number: 01G2769-02  
Date: 12/16/01  
Tested By: MLB  
Checked By: JB

Normal Load = 15,000 psf

REPLICATE No.	GRADIENT	VOLUME cc	TIME secs	FLOW RATE cc/sec	TRANSMISSIVITY m2/sec	TRANSMISSIVITY gal/min/ft
72 Hour		Test Water Temp. =		15.8	Temp. Cor. Fact =	1.113
1	0.10	2317.00	39.44	58.75	2.15E-03	1.04
2	0.10	2334.00	39.71	58.78	2.15E-03	1.04
3	0.10	2352.00	39.88	58.98	2.15E-03	1.04
Average					2.15E-03	1.04
72 Hours		Test Water Temp. =		15.8	Temp. Cor. Fact =	1.113
1	0.02	919.00	40.22	22.85	4.17E-03	0.40
2	0.02	941.00	41.24	22.82	4.17E-03	0.40
3	0.02	949.00	41.54	22.85	4.17E-03	0.40
Average					4.17E-03	0.40
100 Hours		Test Water Temp. =		14.1	Temp. Cor. Fact =	1.164
1	0.10	2275.00	40.56	56.09	2.14E-03	1.03
2	0.10	2203.00	39.40	55.91	2.14E-03	1.03
3	0.10	2259.00	40.40	55.92	2.14E-03	1.03
Average					2.14E-03	1.03
100 Hours		Test Water Temp. =		14.1	Temp. Cor. Fact =	1.164
1	0.02	918.00	42.17	21.77	4.16E-03	0.40
2	0.02	906.00	41.62	21.77	4.16E-03	0.40
3	0.02	901.00	41.37	21.78	4.16E-03	0.40
Average					4.16E-03	0.40

**J&L Testing Company, Inc.**

938 S. Central Ave., Canonsburg, Pa. Tel: 724-746-4441 : Fax: 724-745-4261



## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02

Submittal Identifier:	<u>D-02274-010-A</u>	<input checked="" type="checkbox"/> Original Submittal	<input type="checkbox"/> Supplement
Submitted:	<u>February 13, 2002</u>	<input type="checkbox"/> Resubmittal	<input type="checkbox"/> Information Only
No. of Copies:	<u>8</u>		

Submittal Description: Geocomposite QA/QC Roll Certificates: Lot 4

Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)

Manufacturer: Tenax Corporation

Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

SHOP DRAWING REVIEW	
<b>ENGINEER'S REVIEW</b> Approved <input checked="" type="checkbox"/> Not Approved <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Comments Attached <input type="checkbox"/>	<b>RESPONSE REQUIRED OF CONTRACTOR</b> Confirm <input type="checkbox"/> Resubmit <input type="checkbox"/>
<p>The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.</p> <p>By <u>AMS</u> Date <u>3/1/02</u></p>	

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: January 2, 2002**

**Lot # 4**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## **Table of Contents**

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<b>MQC of Geonet .....</b>	<b>2</b>
<b>MQC of Geotextile .....</b>	<b>3</b>
<b>MQC of Geocomposite.....</b>	<b>4</b>



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000  
Fax: 410-522-7015

Order Line: (800) 356-8495  
Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 4

January 2, 2002

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101263, 0101264, 0101265, 0101266, 0101267, 0101268, 0101269, 0101270, 0101271, 0101272, 0101273, 0101274, 0101275, 0101276, 0101277, 0101278, 0101279, 0101280, 0101281, 0101282, 0101283, 0101284, 0101285, 0101286, 0101287, 0101288, 0101289, 0101290, 0101291, 0101292, 0101293, 0101294, 0101295, 0101296, 0101297, 0101298, 0101299, 0101300, 0101301, 0101302, 0101303, 0101304, 0101305, 0101306, 0101307, 0101308, 0101309, 0101310, 0101311, 0101312, 0101313, 0101314, 0101315, 0101316, 0101317, 0101318, 0101319, 0101320, 0101321, 0101322, 0101323, 0101324, 0101325, 0101326, 0101327, 0101328, 0101329, 0101330, 0101331, 0101332, 0101333, 0101334, 0101335, 0101336, 0101337, of Tendrain 7 70-2, consisting of lot # 4 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:  
Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 4, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager

# TENDRAIN 770-2

## DOUBLE-SIDED GEOCOMPOSITE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
C Elongation	ASTM D4632	%	50	b, Note 4
M n Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
UV Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
<u>Gradient/Load:</u>			15,000 psf (720 kPa)	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
c = Minimum Value    d = Maximum Value

### NOTES:

- Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
- Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
- Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
- Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
- Roll dimensions are measured at the time of manufacture.
- Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
- Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



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### Geonet MQC Test Results

**Product** TD 7  
**Project** Pasco Landfill  
**Lot #** 4  
**Dimensions** 6.7' x 200'  
**Testing Lab** Tenax Corp.

Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm <sup>3</sup> )	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D4595-94 (lb/ft)
0100386	12/13/2001	329	0.952	2.50	0.510	1488
0100389	12/14/2001	318	0.952	2.61	0.550	1512
0100393	12/15/2001	325	0.953	2.36	0.490	1592
0100398	12/20/2001	325	0.950	2.49	0.055	1968
0100402	12/20/2001	335	0.950	2.50	0.500	1597
0100406	12/20/2001	335	0.952	2.70	0.510	1597
0100409	12/20/2001	320	0.947	2.50	0.500	2160

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		327	0.951	2.52	0.445	1702
Standard Dev.		7	0.002	0.11	0.173	257
Specifications		300	0.940	2.00	< 1	1000

#### Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100386	54.00	50
	0100389	55.00	50
	0100393	55.00	50
	0100398	57.00	50
	0100402	60.00	50
	0100406	61.00	50
	0100409	56.00	50
	Average (Specs)	56.86	50

Tested by

David Mitchell

Date

01/02/2002

Checked by

Ghada Ellithy, Ph.D., P.E.

Date

01/02/2002

Date: 12/7/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: Norma Freeman

ROLL #

130111084	130111123	130111163
130111085	130111124	130111164
130111086	130111133	130111165
130111087	130111134	130111166
130111088	130111135	130111167
130111089	130111137	130111168
130111090	130111138	130111169
130111091	130111139	130111170
130111092	130111140	130111171
130111093	130111141	130111172
130111094	130111142	130111173
130111095	130111143	130111182
130111100	130111144	130111184
130111103	130111151	130111185
130111118	130111159	130111192
130111119	130111160	130111195
130111120	130111161	130111196
130111122	130111162	130111126





*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/25/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity Permeability</i>	
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-l)</i>	<i>(cm/sec)</i>
130111084	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111085	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111086	6.7	92	214	228	92	124	134	152	125	356	0.212	2.0	0.5
130111087	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111088	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111089	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111090	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111091	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111092	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111093	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111094	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5
130111095	6.2	85	197	223	99	117	107	116	119	352	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111100	6.2	89	190	215	96	114	114	122	114	352	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111103	6.2	89	190	215	96	114	122	121	114	352	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111118	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5
130111119	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5
130111120	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111122	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5
130111123	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5
130111124	6.4	90	197	224	93	123	121	123	126	340	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111133	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5
130111134	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5
130111135	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111137	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5
130111138	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111139	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111140	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111141	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111142	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111143	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5
130111144	6.6	99	206	211	97	119	107	128	120	372	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity Permeability	
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111151	6.4	97	199	171	94	116	101	140	112	352	0.212	2.2	0.5





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111159	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111160	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111161	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111162	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111163	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111164	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111165	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111166	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111167	6.6	99	202	236	103	121	113	141	125	372	0.212	2.0	0.5
130111168	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5
130111169	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5
130111170	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5
130111171	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5
130111172	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5
130111173	6.1	92	188	218	98	121	101	133	116	342	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111182	6.5	93	201	234	97	114	96	120	122	354	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111184	6.5	93	201	234	97	114	96	120	122	354	0.212	2.0	0.5
130111185	6.5	93	201	234	97	114	96	120	122	354	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111192	6.7	92	197	220	94	123	125	114	124	355	0.212	2.0	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111195	6.7	92	197	220	94	123	125	114	124	355	0.212	2.0	0.5
130111196	6.7	92	197	220	94	123	125	114	124	355	0.212	2.0	0.5

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	4
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101263	0100391	130111141	130111103	200
0101264	0100391	130111141	130111103	200
0101265	0100391	130111141	130111103	200
0101266	0100391	130111143	130111093	200
0101267	0100391	130111143	130111093	200
0101268	0100391	130111143	130111093	200
0101269	0100391	130111143	130111093	200
0101270	0100391	130111084	130111091	200
0101271	0100391	130111084	130111091	200
0101272	0100391	130111084	130111091	180
0101273	0100387	130111084	130111091	200
0101274	0100387	130111084	130111091	200
0101275	0100387	130111135	130111087	200
0101276	0100387	130111135	130111087	200
0101277	0100387	130111135	130111087	200
0101278	0100387	130111135	130111087	200
0101279	0100387	130111135	130111087	200
0101280	0100387	130111134	130106331	200
0101281	0100387	130111134	130106331	147
0101282	0100392	130111134	130106331	200
0101283	0100392	130111134	130106331	200
0101284	0100392	130111134	130111173	200
0101285	0100392	130111134	130111173	200
0101286	0100392	130111134	130111142	200
0101287	0100392	130111134	130111142	200
0101288	0100392	130111134	130111142	200
0101289	0100392	130111142	130111173	200
0101290	0100392	130111142	130111170	195
0101291	0100393	130111142	130111170	200
0101292	0100393	130111172	130111170	200
0101293	0100393	130111172	130111170	200
0101294	0100393	130111172	130111168	200
0101295	0100393	130111092	130111168	139
0101296	0100398	130111169	130111164	200
0101297	0100398	130111169	130111164	200
0101298	0100398	130111169	130111164	200
0101299	0100398	130111169	130111118	200
0101300	0100398	130111169	130111118	200
0101301	0100398	130111171	130111118	200
0101302	0100398	130111171	130111118	200
0101303	0100398	130111171	130111118	200
0101304	0100398	130111171	130111133	182
0101305	0100403	80075170	130111133	200
0101306	0100403	130111261	130111133	200
0101307	0100403	130111261	130111133	200
0101308	0100403	130111261	130111279	200
0101309	0100403	130111261	130111279	200

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	4
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101310	0100403	130111261	130111279	200
0101311	0100403	130111285	130111279	200
0101312	0100403	130111285	130111279	200
0101313	0100403	130111285	130111309	194
0101314	0100405	130111285	130111309	200
0101315	0100405	130111285	130111309	200
0101316	0100405	130112615	130111309	200
0101317	0100405	130112615	130111309	200
0101318	0100405	130112615	130111309	200
0101319	0100404	13011235	130111269	200
0101320	0100404	13011235	130111250	200
0101321	0100404	13011235	130111250	200
0101322	0100404	130111265	130111250	200
0101323	0100404	130111265	130111250	200
0101324	0100404	130111265	130111250	200
0101325	0100404	130111265	130111248	200
0101326	0100404	130111265	130111248	200
0101327	0100404	130111270	130111269	200
0101328	0100406	130111310	130111237	200
0101329	0100406	130111310	130111237	200
0101330	0100406	130111310	130111300	200
0101331	0100406	130111310	130111300	200
0101332	0100408	130111310	130111300	200
0101333	0100408	130111268	130111300	200
0101334	0100408	130111268	130111300	200
0101335	0100408	130111268	130111278	200
0101336	0100408	130111268	130111278	200
0101337	0100408	130111268	130111278	200



Corporation

**4800 East Monument Street  
Baltimore, Maryland 21205**Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: [www.tenaxus.com](http://www.tenaxus.com)**Peel Strength Geocomposite Testing Report**  
**ASTM F904\*****Product** Tendrain 770-2  
**Lot :** 4  
**Roll Size** 6.7' x 200'  
**Project** Pasco Landfill  
**Testing Lab** Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101263	12/21/2001	1.21	1.41	
		1.28	1.50	
		1.25	1.33	
		1.05	1.20	
		1.12	1.37	
		1.18	1.36	Average
		0.10	0.11	Std. Deviation
		1.00	1.00	Specification (minimum)

\*Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min., for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

**Tested by**

David Mitchell

**Date** 01/02/2002**Checked by**

Christine Caropresso

**Date** 01/02/2002





## Precision Geosynthetic Laboratories

December 26, 2001

Mr. David Mitchell  
**TENAX CORPORATION**  
4800 E Monument Street  
Baltimore, MD 21205

ISO 9002



Post-it® Fax Note 7671		Date 12/26	# of pages 3
To David Mitchell	From EDI/TH		
Co./Dept.	Co.		
Phone #	Phone #		
Fax # 410-522-7015	Fax #		

Dear Mr. Mitchell:

RE: PASCO LANDFILL

Thank you for consulting Precision Geosynthetic Laboratories for your material testing needs.

It should be noted that the test specimen and test sample used for this report was believed to be representative of the material produced under the designation herein stated. However, these results are indicative of only the specimens that were actually tested. The testing herein is based upon accepted industry practice as well as the test method listed. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the final use and purpose of the material.

By accepting the data and results represented on this report, Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims arising out of the use of this data to the cost for the respective test(s) represented in this report, and Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liability in excess of the aforementioned limit.

The test data and all associated project information shall be held in confidence and disclosed to other parties only with the authorization of Client or Precision Geosynthetic Laboratories.

It is a company policy to keep the physical records of each job for 2 years since the receipt of the samples and keep the electronic file for 7 years. **Failed seam samples are kept for 7 years; good seam samples are disposed after 2 weeks and conformance samples are disposed after 1 month.** Should you need us to keep them longer, please advise us in writing.

If you have any questions or if we may be of further service, please do not hesitate to call at 800-522-4599.

Sincerely,

### PRECISION GEOSYNTHETIC LABORATORIES

  
Cora B. Queja  
Vice President

Cora B. Queja  
Vice President

Enclosure: (Job No. 011294)



## Precision Geosynthetic Laboratories

CLIENT: TENAX CORPORATION  
PROJECT: PASCO LANDFILL



### VERIFICATION OF MATERIAL PROPERTIES (PGL Job No. 011294)

**MATERIAL DESCRIPTION:** Geocomposite, TENDRAIN 770-2 (PRE-CUT SAMPLE)

**DATE RECEIVED:** December 20, 2001

**DATE REPORTED:** December 26, 2001

### **SAMPLE IDENTIFICATIONS:**

#### **SAMPLE ID**

#### **PRECISION CONTROL NUMBER**

Lot No. 4

73894

### **TESTS REQUIRED:**

#### **TEST METHOD**

#### **DESCRIPTION**

ASTM D4716

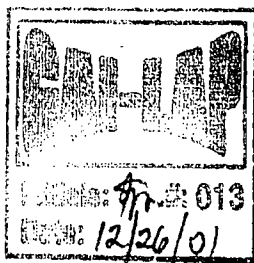
Transmissivity

**TEST CONDITIONS:** The sample was conditioned for a minimum one hour in the laboratory at  $22 \pm 2^{\circ}\text{C}$  ( $71.6 \pm 3.6^{\circ}\text{F}$ ) and at  $60 \pm 10\%$  relative humidity prior to test.

### **TEST RESULTS:**

The test results are summarized in Table 1. The units in which the data are reported are included on the table.

### **PRECISION GEOSYNTHETIC LABORATORIES**



Edith Pintor  
Quality Assurance

Cora B. Queja  
Vice President

**TABLE 1.**  
**MATERIAL PROPERTIES**  
 CLIENT: TENAX CORPORATION  
 PROJECT: PASCO LANDFILL

Date Received: 12/20/01

Date Final Reported: 12/26/01

Client Sample ID: Lot No. 4

Material Description: Geocomposite, TENDRAIN 770-2 (PRE-CUT SAMPLE)

QC'd By: *[Signature]*

PGL Job No.: 071294

PGL Control No.: 73894

SPECIMENS											Avg.	Std. Dev.	Proj. Specs.	
1	2	3	4	5	6	7	8	9	10					
METHOD	DESCRIPTION													
<u>Geocomposite:</u>														
ASTM D4716	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 1 hr)												
MD	2.96											2.96	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 24 hrs)												
MD	2.85											2.85	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 48 hrs)												
MD	2.73											2.73	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 72 hrs)												
MD	2.62											2.62	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 96 hrs)												
MD	2.58											2.58	N/A	
	** Transmissivity (x10 <sup>-3</sup> m <sup>2</sup> /sec)	(Normal Pressure: 15,000 psf; Gradient: 0.1; Seating Time: 100 hrs)												
MD	2.58											2.58	N/A	
<u>** Geosynthetics arranged as follows:</u>														
	Plate											Thickness = 418 mils (Before)		
	Ottawa Sand	+++++++										Thickness = 372.5 mils (After)		
	Geocomposite	xxxxxxxxx												
	60 mil Smooth HDPE Liner	+++++++												

MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION



**Precision Geosynthetic Laboratories**



**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720


**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02

Submittal Identifier:	<u>D-02274-011-A</u>	<input checked="" type="checkbox"/> Original Submittal	<input type="checkbox"/> Supplement
Submitted:	<u>February 13, 2002</u>	<input type="checkbox"/> Resubmittal	<input type="checkbox"/> Information Only
No. of Copies:	<u>8</u>		

Submittal Description: Geocomposite QA/QC Roll Certificates: Lot 5

Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)

Manufacturer: Tenax Corporation

Installer: COMANCO Environmental Corporation

**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:	<input type="checkbox"/> Code 1 - Approved	<input type="checkbox"/> Code 4 - Approved As Noted, Resubmit
	<input type="checkbox"/> Code 2 - Approved As Noted	<input type="checkbox"/> Code 5 - Not Approved
	<input type="checkbox"/> Code 3 - Approved As Noted, Confirm	<input type="checkbox"/> Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

**SHOP DRAWING REVIEW**

ENGINEER'S REVIEW		RESPONSE REQUIRED OF CONTRACTOR
Approved <input checked="" type="checkbox"/>	Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>
Approved As Noted <input type="checkbox"/>	Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

CAMP DRESSER &amp; MCKEE INC.

By AMSDate 3/1/02

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: January 3, 2002**

**Lot # 5**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

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4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000  
Fax: 410-522-7015

Order Line: (800) 356-8495  
Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 5

January 2, 2002

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101338, 0101339, 0101340, 0101341, 0101342, 0101343, 0101344, 0101345, 0101346, 0101347, 0101348, 0101349, 0101350, 0101351, 0101352, 0101353, 0101354, 0101355, 0101356, 0101357, 0101358, 0101359, 0101360, 0101361, 0101362, 0101363, 0101364, 0101365, 0101366, 0101367, 0101368, 0101369, 0101370, 0101371, 0101372, 0101373, 0101374, 0101375, 0101376, 0101377, 0101378, 0101379, 0101380, 0101381, 0101382, 0101383, 0101384, 0101385, 0101386, 0101387, 0101388, 0101389, 0101390, 0101391, 0101392, 0101393, 0101394, 0101395, 0101396, 0101397, 0101398, 0101399, 0101400, 0101401, 0101402, 0101403, 0101404, 0101405, 0101406, 0101407, 0101408, 0101409, 0101410, 0101411, 0101412, 0101413, of Tendrain 7 70-2, consisting of lot # 5 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications:

Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 5, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager

**Performance in  
Plastic Technology<sup>SM</sup>**







Corporation

**4800 East Monument Street  
Baltimore, Maryland 21205**Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: [www.tenaxus.com](http://www.tenaxus.com)**Geonet MQC Test Results**

**Product** TD 7  
**Project** Pasco Landfill  
**Lot #** 5  
**Dimensions** 6.7' x 200'  
**Testing Lab** Tenax Corp.

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
0100406	12/20/2001	335	0.952	2.70	0.510	1597
0100409	12/20/2001	320	0.947	2.50	0.500	2160
0100413	12/22/2001	323	0.952	2.50	0.350	1968
0100417	12/23/2001	335	0.950	2.50	0.400	2088
Average		328	0.950	2.55	0.440	1953
Standard Dev.		8	0.002	0.10	0.078	250
Specifications		300	0.940	2.00	< 1	1000

**Compression**

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100406	61.00	50
	0100409	56.00	50
	0100413	57.00	50
	0100417	61.00	50
Average (Specs)		58.75	50

Tested by

David Mitchell

Date

01/03/2002

Checked by

Christine Caropresso

Date

01/03/2002

Date: 12/19/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: Crystal L. Gore

ROLL #

130110767	130111258	130111289
130110768	130111259	130111290
130110769	130111262	130111283
130110770	130111263	130111284
130110771	130111264	130111292
130110772	130111266	130111294
130110773	130111271	130111296
130110774	130111272	130111297
130110777	130111273	130111298
130110779	130111274	130111299
130111243	130111275	130111300
130111244	130111276	130111301
130111246	130111277	130111304
130111247	130111278	130111305
130111234	130111280	130111306
130111238	130111288	130111307
	130111314	130111308
	130111315	130111310
		130111311
		130111312



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110767	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110768	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110769	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110770	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110771	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110772	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110773	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110774	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110777	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110779	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111243	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111244	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130111246	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111247	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111234	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity Permeability	
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111238	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130111258	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5
130111259	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111262	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111263	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111264	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111266	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6		Item Code: FBR0608100		Roll Width: 15.0 feet		Test Date: 11/27/2							
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111271	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111272	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111273	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111274	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111275	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111276	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5
130111277	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111278	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity Permeability	
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111280	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd2)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111288	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111289	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111290	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111283	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111284	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111292	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111294	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-I)</i>	<i>(cm/sec)</i>
130111296	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111297	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111298	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111299	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111300	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111301	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111304	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111305	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111306	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111307	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111308	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111310	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111311	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111312	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111314	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111315	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4

Date: 12/20/2001

Number of Rolls

54

FBR0608100

SO#21538

APPROVED BY:

Crystal A. Gore

## ROLL #

130110712 -	130110729 -	130110746 -
130110713 -	130110730 -	130110747 -
130110714 -	130110731 -	130110751 -
130110715 -	130110732 -	130110752 -
130110716 -	130110733 -	130110753 -
130110717 -	130110734 -	130110775 -
130110718 -	130110735 -	130110776 -
130110719 -	130110736 -	130110778 -
130110720 -	130110737 -	130110780 -
130110721 -	130110738 -	130110781 -
130110722 -	130110739 -	130110782 -
130110723 -	130110740 -	130110783 -
130110724 -	130110741 -	130110784 -
130110725 -	130110742 -	130110785 -
130110727 -	130110743 -	130111101 -
130110728 -	130110744 -	130111113 -
	130111130 -	130111114 -
	130112665 -	130111115 -
	130112666 -	130112674 -



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6		Item Code: FBR0608100				Roll Width: 15.0 feet				Test Date: 12/16/2			
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130112674	6.9	94	234	242	94	128	108	112	118	350	0.180	1.5	0.3





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/16/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(min)	(sec-l)	(cm/sec)
130112665	6.4	92	200	225	98	109	98	123	121	352	0.180	1.5	0.3
130112666	6.4	92	200	225	98	109	98	123	121	352	0.180	1.5	0.3



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW8

Item Code: FBR0608100

Roll Width: 150 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111130	61	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111113	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111114	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111115	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632 MD (lbs) CD (lbs)		ASTM D 4632 MD (%) CD (%)		ASTM D 4533 MD (lbs) CD (lbs)		ASTM D 4833 (lbs)	ASTM D 3786 (psi)	ASTM D 4751 (mm)	ASTM D 4491 (sec-l)	ASTM D 4491 (cm/sec)
130111101	6.2	89	150	215	96	114	114	122	114	352	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBRUG08100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110780	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110781	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110782	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110783	6.6	99	228	215	88	113	90	119	123	368	0.212	2.3	0.6
130110784	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.8
130110785	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
13G110778	6.6	97	201	238	94	120	117	181	128	362	0.212	2.2	0.6



**GSE**  
*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 150 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110775	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110776	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



**GSE**  
Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NWS

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110751	6.1	89	137	214	98	120	98	127	119	352	0.212	2.2	0.6
130110752	6.1	89	137	214	98	120	98	127	119	352	0.212	2.2	0.6
130110753	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110746	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110747	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110727	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110728	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110729	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110730	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110731	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110732	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110733	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110734	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110735	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110736	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110737	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110738	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110739	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110740	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110741	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110742	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110743	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110744	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: 13R0608100

Roll Width: 15.0 feet

Test Date: 11/18/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110712	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110713	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110714	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110715	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110716	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110717	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110718	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110719	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110720	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110721	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110722	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110723	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110724	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110725	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	5
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101338	0100408	130111277	130111278	200
0101339	0100408	130111277	130111278	200
0101340	0100406	130111277	130110774	200
0101341	0100406	130111277	130110774	200
0101342	0100406	130111311	130110774	128
0101343	0100409	130111311	130110774	200
0101344	0100409	130111311	130110774	200
0101345	0100409	130111311	130111312	200
0101346	0100409	130111311	130111312	200
0101347	0100409	130111311	130111312	200
0101348	0100409	130111311	130111312	200
0101349	0100409	130111314	130111312	200
0101350	0100409	130111314	130111284	200
0101351	0100409	130111314	130111284	180
0101352	0100407	130111314	130111284	200
0101353	0100407	130110776	130111284	200
0101354	0100407	130110776	130111284	200
0101355	0100407	130110776	130110783	200
0101356	0100407	130110776	130110783	200
0101357	0100407	130110776	130110783	200
0101358	0100407	130110782	130110783	200
0101359	0100407	130110782	130110783	200
0101360	0100407	130110782	130110783	114
0101361	0100413	130110782	130110778	200
0101362	0100413	130110782	130110778	200
0101363	0100413	130110785	130110778	200
0101364	0100413	130110785	130110778	200
0101365	0100413	130110785	130110778	200
0101366	0100413	130110785	130110780	200
0101367	0100413	130110785	130110780	200
0101368	0100413	130110735	130110780	200
0101369	0100413	130110735	130110780	190
0101370	0100412	130110735	130110780	200
0101371	0100412	130110735	130110781	200
0101372	0100412	130110735	130110781	200
0101373	0100412	130110722	130110781	200
0101374	0100412	130110722	130110781	200
0101375	0100410	130110722	130110733	200
0101376	0100410	130110722	130110733	200
0101377	0100410	130110784	130110733	200
0101378	0100410	130110784	130110733	200
0101379	0100410	130110784	130110733	200
0101380	0100410	130110784	130110723	200
0101381	0100410	130110784	130110723	200
0101382	0100410	130110784	130110723	200
0101383	0100411	130111115	130110723	200
0101384	0100411	130111115	130110714	200

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	5
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101385	0100411	130111115	130110714	200
0101386	0100411	130111115	130110714	200
0101387	0100411	130111115	130110714	200
0101388	0100411	130110731	130110714	200
0101389	0100411	130110731	130110714	200
0101390	0100411	130110731	130110775	200
0101391	0100411	130110731	130110775	200
0101392	0100414	130110719	130110713	200
0101393	0100414	130110719	130110713	200
0101394	0100414	130110719	130110713	200
0101395	0100414	130110736	130110713	200
0101396	0100414	130110736	130110713	200
0101397	0100414	130110736	130110725	200
0101398	0100414	130110736	130110725	200
0101399	0100414	130110736	130110725	200
0101400	0100414	130111130	130110725	200
0101401	0100415	130111130	130110725	200
0101402	0100415	130111130	130110718	200
0101403	0100415	130111130	130110718	200
0101404	0100415	130111130	130110718	200
0101405	0100415	130111130	130110718	200
0101406	0100415	130111114	130110718	200
0101407	0100415	130111114	130110727	200
0101408	0100415	130111114	130110727	200
0101409	0100415	130110732	130110727	200
0101410	0100416	130110732	130110727	200
0101411	0100416	130110732	130110727	200
0101412	0100416	130110732	130110720	200
0101413	0100416	130110732	130110720	200



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: www.tenaxus.com

## Peel Strength Geocomposite Testing Report

ASTM F904\*

Product Tendrain 770-2  
Lot : 5  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101338	12/26/2001	1.38	1.50	
		1.02	1.15	
		1.22	1.25	
		1.08	1.37	
		1.11	1.45	
		1.16	1.34	Average
		0.14	0.14	Std. Deviation
		1.00	1.00	Specification (minimum)

\* Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min., for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

David Mitchell

Date 01/03/2002

Checked by

Christine Caropresso

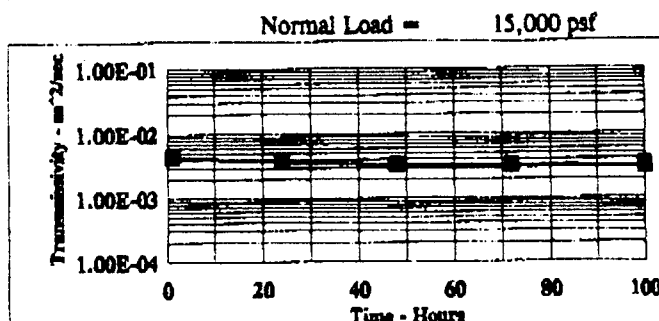
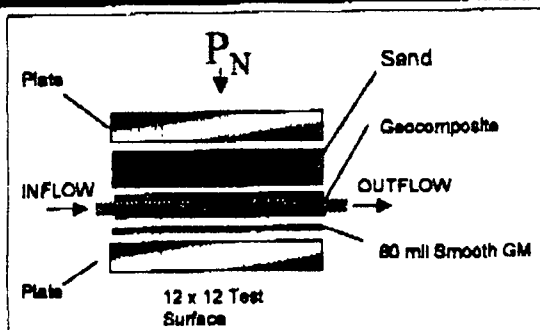
Date 01/03/2002

# TRANSMISSIVITY TEST RESULTS ASTM D-4716

**JLT**

Client: Tenax Corporation  
Project: Pasco County Landfill  
Material: Tendrain 770-2  
Sample ID: Lot 5

Job Number: 01G2769-02  
Date: 12/31/01  
Tested By: DB  
Checked By: JB



REPLICATE No.	GRADIENT	VOLUME cc	TIME secs	FLOW RATE cc/sec	TRANSMISSIVITY m2/sec	TRANSMISSIVITY gal/min/ft
1 Hour		Test Water Temp. =		12.9	Temp. Cor. Fact =	1.203
1	0.10	3550.00	30.75	115.45	4.56E-03	2.20
2	0.10	3523.00	30.60	115.13	4.54E-03	2.20
3	0.10	3516.00	30.58	114.98	4.54E-03	2.19
Average					4.55E-03	2.20
24 Hours		Test Water Temp. =		12.7	Temp. Cor. Fact =	1.21
1	0.10	2935.00	30.63	95.76	3.80E-03	1.84
2	0.10	2938.00	30.67	95.79	3.80E-03	1.84
3	0.10	2949.00	30.79	95.78	3.80E-03	1.84
Average					3.80E-03	1.84
48 Hours		Test Water Temp. =		12.1	Temp. Cor. Fact =	1.23
1	0.10	2540.00	30.48	83.33	3.36E-03	1.62
2	0.10	2537.00	30.36	83.56	3.37E-03	1.63
3	0.10	2525.00	30.16	83.72	3.38E-03	1.63
Average					3.37E-03	1.63
72 Hours		Test Water Temp. =		12.6	Temp. Cor. Fact =	1.213
1	0.10	2526.00	30.36	83.20	3.31E-03	1.60
2	0.10	2509.00	30.39	82.56	3.29E-03	1.59
3	0.10	2544.00	30.75	82.73	3.29E-03	1.59
Average					3.30E-03	1.59
100 Hours		Test Water Temp. =		12.8	Temp. Cor. Fact =	1.207
1	0.10	2514.00	30.44	82.59	3.27E-03	1.58
2	0.10	2519.00	30.52	82.54	3.27E-03	1.58
3	0.10	2524.00	30.61	82.46	3.27E-03	1.58
Average					3.27E-03	1.58

**J&L Testing Company, Inc.**

938 S. Central Ave., Canonsburg, Pa. Tel: 724-746-4441 : Fax: 724-745-4261

# COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner: <u>Pasco County B.O.C.C.</u>	Project No. <u>01-063</u>	Project Manager: <u>John Power</u>
Engineer: <u>Camp Dresser &amp; McKee</u>	Project No. <u>6104-28936</u>	Project Manager: <u>Daniel Strobbridge, Q.E.P.</u>
Contractor: <u>Handex of Florida, Inc.</u>	Project No. <u>123477</u>	Project Manager: <u>Gary L. Conaway, P.E.</u>
Subcontractor: <u>COMANCO Environmental Corp.</u>	Project No. <u>010-848</u>	Project Manager: <u>Pablo J. Rivera</u>

### COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: \_\_\_\_\_

Date: 02-13-02

Submittal Identifier: D-02274-012-A

☒ Original Submittal

☐ Supplement

Submitted: February 13, 2002

☐ Resubmittal

☐ Information Only

No. of Copies: 8

Submittal Description: Geocomposite QA/QC Roll Certificates: Lot 6

Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)

Manufacturer: Tenax Corporation

Installer: COMANCO Environmental Corporation

### COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved

☐ Code 4 - Approved As Noted, Resubmit

☐ Code 2 - Approved As Noted

☐ Code 5 - Not Approved

☐ Code 3 - Approved As Noted, Confirm

☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

### SHOP DRAWING REVIEW

ENGINEER'S REVIEW		RESPONSE REQUIRED OF CONTRACTOR	
Approved <input checked="" type="checkbox"/>	Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>	
Approved as Noted <input type="checkbox"/>	Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>	

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from error or omissions in the submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequence or procedures of construction and performing his work in a safe manner.

By AMS

Date 3/1/02



## **QUALITY CONTROL SUMMARY**

### **TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: January 3, 2002**

**Lot # 6**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## **Table of Contents**

<b>Certification Letter and Product Specification .....</b>	<b>1</b>
<b>MQC of Geonet .....</b>	<b>2</b>
<b>MQC of Geotextile .....</b>	<b>3</b>
<b>MQC of Geocomposite.....</b>	<b>4</b>



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000

Order Line: (800) 356-8495

Fax: 410-522-7015

Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 6

January 2, 2002

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101414, 0101415, 0101416, 0101417, 0101418, 0101419, 0101420, 0101421, 0101422, 0101423, 0101424, 0101425, 0101426, 0101443, 0101428, 0101429, 0101430, 0101431, 0101432, 0101433, 0101434, 0101435, 0101436, 0101437, 0101438, 0101439, 0101440, 0101441, 0101442, 0101443, 0101444, 0101445, 0101446, 0101447, 0101448, 0101449, 0101450, 0101451, 0101452, 0101453, 0101454, 0101455, 0101456, 0101457, 0101458, 0101459, 0101460, 0101461, 0101462, 0101463, 0101464, 0101465, 0101466, 0101467, 0101468, 0101469, 0101470, 0101471, 0101472, 0101473, 0101474, 0101475, 0101476, 0101477, 0101478, 0101479, 0101480, 0101481, 0101482, 0101483, 0101484, 0101485, 0101486, 0101487, of Tendrain 7 70-2, consisting of lot # 6 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 6, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager

# TENDRAIN 770-2

## JBLE-SIDED GEOCOMPOSITE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
Grab Elongation	ASTM D4632	%	50	b, Note 4
Grab Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
UV Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
<u>Gradient/Load:</u>			<u>15,000 psf (720 kPa)</u>	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
 c = Minimum Value    d = Maximum Value

### NOTES:

- Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
- Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in. x 4 in. specimen and a constant rate of strain of 0.04 in./min.
- Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
- Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
- Roll dimensions are measured at the time of manufacture.
- Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
- Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

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### Geonet MQC Test Results

Product TD 7  
Project Pasco Landfill  
Lot # 6  
Dimensions 6.7' x 200'  
Testing Lab Tenax Corp.

Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D4595-94 (lb/ft)
0100413	12/22/2001	323	0.952	2.50	0.350	1968
0100417	12/23/2001	335	0.950	2.50	0.400	2088
0100421	12/24/2001	341	0.950	2.40	0.550	1789
0100425	12/25/2001	330	0.952	2.44	0.460	1588
0100428	12/26/2001	320	0.951	2.52	0.300	2256
0100430	12/27/2001	327	0.950	2.49	0.400	2136

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MF1 ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		329	0.951	2.48	0.410	1971
Standard Dev.		8	0.001	0.05	0.087	246
Specifications		300	0.940	2.00	< 1	1000

#### Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100413	57.00	50
	0100417	61.00	50
	0100421	56.00	50
	0100421	57.00	50
	0100425	60.90	50
	0100428	60.00	50
	0100430	61.00	50
	Average (Specs)	58.99	50

Tested by

David Mitchell

Date

01/03/2002

Checked by

Christine Caropresso

Date

01/03/2002

Date: 12/20/2001

Number of Rolls

54

FBR0608100

SO#21538

APPROVED BY:

Crystal A. Gore

## ROLL #

130110712 -	130110729 -	130110746 -
130110713 -	130110730 -	130110747 -
130110714 -	130110731 -	130110751 -
130110715 -	130110732 -	130110752 -
130110716 -	130110733 -	130110753 -
130110717 -	130110734 -	130110775 -
130110718 -	130110735 -	130110776 -
130110719 -	130110736 -	130110778 -
130110720 -	130110737 -	130110780 -
130110721 -	130110738 -	130110781 -
130110722 -	130110739 -	130110782 -
130110723 -	130110740 -	130110783 -
130110724 -	130110741 -	130110784 -
130110725 -	130110742 -	130110785 -
130110727 -	130110743 -	130111101 -
130110728 -	130110744 -	130111113 -
	130111130 -	130111114 -
	130112665 -	130111115 -
	130112666 -	130112674 -



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6		Item Code: FBR0608100				Roll Width: 15.0 feet				Test Date: 12/16/2			
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130112674	6.9	94	234	242	94	128	108	112	118	350	0.180	1.5	0.3





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/16/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130112665	6.4	92	200	225	98	109	98	123	121	352	0.180	1.5	0.3
130112666	6.4	92	200	225	98	109	98	123	121	352	0.180	1.5	0.3



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thicknest	Grab Strength		Grab Elongation		Trop Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111130	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111113	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111114	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111115	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5



GSE Nonwoven Technology

### Roll Test Data Summary - English Units

Product : NW6

Item Code: 1BR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trop Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111101	6.2	89	190	215	96	114	114	122	114	352	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Tear Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110780	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110781	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110782	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110783	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110784	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110785	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBRD608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110778	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: 1-BR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110775	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110776	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.8



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110751	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6
130110752	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6
130110753	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110746	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110747	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130110727	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110728	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110729	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110730	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110731	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110732	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110733	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110734	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110735	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110736	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110737	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110738	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110739	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110740	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110741	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110742	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110743	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110744	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



**GSE** Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: I-BRD0608100

Roll Width: 15.0 feet

Test Date: 11/18/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110712	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110713	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110714	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110715	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110716	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110717	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110718	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110719	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110720	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110721	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110722	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110723	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110724	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110725	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6

Date: 12/20/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: \_\_\_\_\_

ROLL #

130110712	130110729	130110746
130110713	130110730	130110747
130110714	130110731	130110751
130110715	130110732	130110752
130110716	130110733	130110753
130110717	130110734	130110775
130110718	130110735	130110776
130110719	130110736	130110778
130110720	130110737	130110780
130110721	130110738	130110781
130110722	130110739	130110782
130110723	130110740	130110783
130110724	130110741	130110784
130110725	130110742	130110785
130110727	130110743	130111101
130110728	130110744	130111113
	130111130	130111114
	130112665	130111115
	130112666	130112674



*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/18/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110712	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110713	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110714	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110715	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110716	6.4	92	202	217	101	112	98	140	115	342	0.212	2.3	0.6
130110717	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110718	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110719	6.2	95	190	207	95	124	96	114	124	364	0.212	2.3	0.6
130110720	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110721	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110722	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110723	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110724	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110725	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110727	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110728	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110729	6.7	99	201	212	101	124	104	146	126	351	0.212	2.2	0.6
130110730	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110731	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110732	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110733	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110734	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110735	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110736	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110737	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110738	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110739	6.5	91	192	229	99	113	100	133	119	360	0.212	2.2	0.6
130110740	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110741	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110742	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110743	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110744	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110746	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6
130110747	6.7	102	222	241	91	110	100	131	120	386	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110751	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6
130110752	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6
130110753	6.1	89	187	214	98	120	98	127	119	352	0.212	2.2	0.6





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*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110775	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110776	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110778	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110780	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110781	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110782	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110783	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110784	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110785	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/26/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity Permeability</i>	
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-l)</i>	<i>(cm/sec)</i>
130111101	6.2	89	190	215	96	114	114	122	114	352	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111113	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111114	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5
130111115	6.7	90	228	222	96	119	106	108	122	340	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/26/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111130	6.1	94	192	219	97	120	94	143	118	356	0.212	2.2	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/16/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130112665	6.4	92	200	225	98	109	96	123	121	352	0.180	1.5	0.3
130112666	6.4	92	200	225	98	109	96	123	121	352	0.180	1.5	0.3



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/16/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130112674	6.9	94	234	242	94	128	108	112	118	350	0.180	1.5	0.3



# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	6
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101414	0100416	130110737	130110720	200
0101415	0100416	130110737	130110720	200
0101416	0100416	130110737	130110720	200
0101417	0100416	130110737	130110740	200
0101418	0100416	130110737	130110740	200
0101419	0100417	130110721	130110740	200
0101420	0100417	130110721	130110740	200
0101421	0100417	130110721	130110740	200
0101422	0100417	130110721	130110729	200
0101423	0100417	130110721	130110729	200
0101424	0100417	130110728	130110729	200
0101425	0100417	130110728	130110729	200
0101426	0100417	130110728	130110729	200
0101427	0100417	130110728	130110734	195
0101428	0100419	130110728	130110734	200
0101429	0100419	130110738	130110734	200
0101430	0100419	130110738	130110734	200
0101431	0100419	130110738	130110734	200
0101432	0100419	130110738	130110730	200
0101433	0100419	130110741	130110730	200
0101434	0100419	130110741	130110730	200
0101435	0100419	130110741	130110730	111
0101436	0100420	130110741	130110743	200
0101437	0100420	130110741	130110743	200
0101438	0100420	130111276	130110743	200
0101439	0100420	130111276	130110743	200
0101440	0100420	130111276	130111298	200
0101441	0100420	130111276	130111298	200
0101442	0100420	130111276	130111298	200
0101443	0100420	130110742	130111298	200
0101444	0100422	130110742	130111298	200
0101445	0100422	130110742	130110742	200
0101446	0100422	130110742	130110742	200
0101447	0100422	130110742	130110744	200
0101448	0100422	130110739	130110744	200
0101449	0100422	130110739	130110753	200
0101450	0100422	130110739	130110753	200
0101451	0100422	130110739	130110753	200
0101452	0100423	130110739	130110753	200
0101453	0100423	130112674	130110753	200
0101454	0100423	130112674	130111101	200
0101455	0100423	130112674	130111101	200
0101456	0100423	130112674	130111101	200
0101457	0100423	130110747	130111101	200
0101458	0100423	130110747	130111101	200
0101459	0100423	130110747	130111306	200
0101460	0100423	130110747	130111306	200

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	6
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101461	0100424	130110747	130111306	200
0101462	0100424	130110751	130111306	200
0101463	0100424	130110751	130111306	200
0101464	0100424	130110751	130111283	200
0101465	0100424	130110751	130111283	200
0101466	0100424	130110751	130111283	200
0101467	0100424	130111275	130111283	200
0101468	0100424	130111275	130111283	200
0101469	0100424	130111275	130110746	200
0101470	0100425	130111275	130110746	200
0101471	0100425	130111275	130110746	200
0101472	0100425	130112665	130110746	200
0101473	0100425	130112665	130110746	200
0101474	0100425	130112665	130112666	200
0101475	0100425	130112665	130112666	200
0101476	0100425	130111305	130112666	200
0101477	0100429	130111305	130112666	200
0101478	0100429	130111304	130112666	200
0101479	0100429	130111304	130112666	200
0101480	0100429	130111304	130111274	200
0101481	0100429	130111304	130111274	200
0101482	0100426	130111304	130111274	200
0101483	0100426	130110752	130111274	200
0101484	0100426	130110752	130111274	200
0101485	0100426	130110752	130111274	200
0101486	0100426	130110752	130110777	200
0101487	0100426	130110752	130110777	200



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: www.tenaxus.com

## Peel Strength Geocomposite Testing Report

ASTM F904\*

Product Tendrain 770-2  
Lot : 6  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101414	12/27/2001	1.21	1.05	
		1.39	1.08	
		1.15	1.33	
		1.35	1.22	
		1.29	1.00	
		1.28	1.14	Average
		0.10	0.14	Std. Deviation
		1.00	1.00	Specification (minimum)

\*Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min. for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

David Mitchell

Date 01/03/2002

Checked by

Christine Caropresso

Date 01/03/2002



Corporation

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Baltimore, Maryland 21205

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Web Site: www.tenaxus.com

**Transmissivity Test Data**  
ASTM D 4716-95

Product	Tendrain 770-2	TEST CONFIGURATION					
Lot #	6	Plate					
Roll Size	6.7' x 200'	Sand					
Project	Pasco Landfill	Tendrain 770-2					
Specimen Size	12" x 14"	Geomembrane					
Testing Lab	Tenax Corp.	Plate					
Geocomposite Roll		Testing Date	Load (psf)	Seating Period (hrs)	Gradient	Transmissivity (m2/sec)	Specification (m2/sec)
0101414		12/26/2001	15000	100	0.1	3.12E-03	1.80E-03

Tested by

David Mitchell

Date 01/03/2002

Checked by

Christine Caropresso

Date 01/03/2002

**COMANCO ENVIRONMENTAL CORPORATION**

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720

**SUBMITTAL CONTROL FORM**

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

**COMPLETED BY CONTRACTOR:**

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: \_\_\_\_\_

Date: 02-13-02Submittal Identifier: D-02274-013-A☒ Original Submittal☐ SupplementSubmitted: February 13, 2002No. of Copies: 8☐ Resubmittal☐ Information OnlySubmittal Description: Geocomposite QA/QC Roll Certificates: Lot 7Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)Manufacturer: Tenax CorporationInstaller: COMANCO Environmental Corporation**COMPLETED BY ENGINEER:**

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:

☐ Code 1 - Approved☐ Code 4 - Approved As Noted, Resubmit☐ Code 2 - Approved As Noted☐ Code 5 - Not Approved☐ Code 3 - Approved As Noted, Confirm☐ Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

**SHOP DRAWING REVIEW****ENGINEER'S REVIEW**

Approved ☒ Not Approved ☐  
Approved/as Noted ☐ Comments ☐  
Attached ☐

**RESPONSE REQUIRED OF CONTRACTOR**

Confirm ☐  
Resubmit ☐

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Document. The Contractor is responsible for the details and dimensions of fabrication and construction. The design, methods, techniques, sequences or procedures of construction are the responsibility of the Contractor.

By: AMSDate: 3/1/02

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: January 3, 2002**

**Lot # 7**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## Table of Contents

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Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000

Order Line: (800) 356-8495

Fax: 410-522-7015

Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 7

January 2, 2002

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101488, 0101489, 0101490, 0101491, 0101492, 0101493, 0101494, 0101495, 0101496, 0101497, 0101498, 0101499, 0101500, 0101501, 0101502, 0101503, 0101504, 0101505, 0101506, 0101507, 0101508, 0101509, 0101510, 0101511, 0101512, 0101513, 0101514, 0101515, 0101516, 0101517, 0101518, 0101519, 0101520, 0101521, 0101522, 0101523, 0101524, 0101525, 0101526, 0101527, 0101528, 0101529, 0101530, 0101531, 0101532, 0101533, 0101534, 0101535, 0101536, 0101537, 0101538, 0101539, 0101540, 0101541, 0101542, 0101543, 0101544, 0101545, 0101546, 0101547, 0101548, 0101549, 0101550, 0101551, 0101552, 0101553, 0101554, 0101555, 0101556, 0101557, 0101558, 0101559, 0101560, 0101561, 0101562, of Tendrain 7 70-2, consisting of lot # 7 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 7, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bouters, Ph.D.  
Quality Control Manager



# TENDRAIN 770-2

## DOUBLE-SIDED GEOCOMPOSITE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
Grab Elongation	ASTM D4632	%	50	b, Note 4
Grab Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
UV Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
Gradient/Load:			15,000 psf (720 kPa)	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
 c = Minimum Value    d = Maximum Value

### NOTES:

1. Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in. x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
5. Roll dimensions are measured at the time of manufacture.
6. Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
7. Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

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### Geonet MQC Test Results

Product TD 7  
Project Pasco Landfill  
Lot # 7  
Dimensions 6.7' x 200'  
Testing Lab Tenax Corp.

Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D4595-94 (lb/ft)
0100413	12/22/2001	323	0.952	2.50	0.350	1968
0100417	12/23/2001	335	0.950	2.50	0.400	2088
0100421	12/24/2001	341	0.950	2.40	0.550	1789
0100425	12/25/2001	330	0.952	2.44	0.460	1588
0100428	12/26/2001	320	0.951	2.52	0.300	2256
0100430	12/27/2001	327	0.950	2.49	0.400	2136
0100433	12/27/2001	325	0.950	2.50	0.410	1968
0100436	12/27/2001	325	0.952	2.63	0.400	1820
0100438	12/29/2001	337	0.950	2.46	0.420	1895
0100441	12/29/2001	328	0.952	2.55	0.445	1884

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm <sup>3</sup> )	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		329	0.951	2.50	0.414	1939
Standard Dev.		7	0.001	0.06	0.066	191
Specifications		300	0.940	2.00	< 1	1000

## Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100413	57.00	50
	0100417	61.00	50
	0100421	56.00	50
	0100421	57.00	50
	0100425	60.90	50
	0100428	60.00	50
	0100430	61.00	50
	0100433	60.00	50
	0100436	59.70	50
	0100436	56.52	50
	0100438	59.00	50
	0100441	57.00	50
	Average (Specs)	58.76	50

Tested by

David Mitchell

Date

01/03/2002

Checked by

Christine Caropresso

Date

01/03/2002

Date: 12/19/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: Crystal L. Gore

ROLL #

130110767	130111258	130111289
130110768	130111259	130111290
130110769	130111262	130111283
130110770	130111263	130111284
130110771	130111264	130111292
130110772	130111266	130111294
130110773	130111271	130111296
130110774	130111272	130111297
130110777	130111273	130111298
130110779	130111274	130111299
130111243	130111275	130111300
130111244	130111276	130111301
130111246	130111277	130111304
130111247	130111278	130111305
130111234	130111280	130111306
130111238	130111288	130111307
	130111314	130111308
	130111315	130111310
		130111311
		130111312



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110767	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110768	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110769	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110770	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110771	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110772	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110773	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110774	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261 (oz/yd <sup>2</sup> )	ASTM D 5199 (mils)	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
			MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110777	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6		Item Code: FBR0608100				Roll Width: 15.0 feet				Test Date: 11/20/2			
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd2)	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110779	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111243	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111244	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5





*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111246	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111247	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111234	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111238	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6		Item Code: FBR0608100		Roll Width: 15.0 feet		Test Date: 11/27/2							
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111258	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5
130111259	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111262	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111263	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111264	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111266	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111271	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111272	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111273	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111274	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111275	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111276	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5
130111277	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111278	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111280	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4





*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111288	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111289	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111290	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture	Mullen Burst	Apparent	Permittivity Permeability	
	Unit Area								Strength	Strength	Opening Size		
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111283	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111284	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product : NW6*

*Item Code: FBR0608100*

*Roll Width: 15.0 feet*

*Test Date: 11/27/2*

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111292	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111294	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



**GSE**  
Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111296	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111297	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111298	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111299	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111300	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111301	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111304	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111305	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111306	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111307	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111308	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111310	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111311	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111312	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111314	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111315	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4



# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT : Tendrain 770-2  
 JOB: Pasco Landfill  
 LOT #: 7  
 DATE: 01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101488	0100426	130111307	130110777	200
0101489	0100426	130111307	130110777	200
0101490	0100426	130111307	130110777	200
0101491	0100427	130111307	130111244	200
0101492	0100427	130111307	130111244	200
0101493	0100427	130111243	130111244	200
0101494	0100427	130111243	130111244	200
0101495	0100427	130111243	130111244	200
0101496	0100427	130111243	130110768	200
0101497	0100427	130111243	130110768	200
0101498	0100427	130111264	130110768	200
0101499	0100427	130111264	130110768	183
0101500	0100428	130111264	130110768	200
0101501	0100428	130111264	130111273	200
0101502	0100428	130111264	130111273	200
0101503	0100428	130110779	130111273	200
0101504	0100428	130110779	130111273	200
0101505	0100428	130110779	130111273	200
0101506	0100428	130110779	130111271	200
0101507	0100428	130110779	130111271	200
0101508	0100430	130110773	130111271	200
0101509	0100430	130110773	130111271	200
0101510	0100430	130110773	130111301	200
0101511	0100430	130110773	130111301	200
0101512	0100430	130110773	130111301	200
0101513	0100430	130111238	130111301	200
0101514	0100430	130111238	130111301	200
0101515	0100430	130111238	130111266	200
0101516	0100431	130111238	130111266	185
0101517	0100431	130111315	130111266	200
0101518	0100431	130111315	130111266	200
0101519	0100431	130111315	130111266	200
0101520	0100431	130111315	130111294	200
0101521	0100431	130111315	130111294	200
0101522	0100431	130111315	130111294	200
0101523	0100431	130110772	130111294	200
0101524	0100431	130110772	130111294	200
0101525	0100431	130110772	130111294	195
0101526	0100433	130110772	130111294	200
0101527	0100433	130111258	130111294	200
0101528	0100433	130111258	130110769	200
0101529	0100433	130111258	130110767	200
0101530	0100433	130111258	130110767	200
0101531	0100433	130111258	130110767	200
0101532	0100433	130111297	130110767	200
0101533	0100433	130111297	130110767	200

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	7
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101534	0100432	130111297	130111263	200
0101535	0100432	130111297	130111263	200
0101536	0100432	130110771	130111263	200
0101537	0100432	130110771	130111263	200
0101538	0100432	130110771	130111263	200
0101539	0100432	130110771	130111292	200
0101540	0100432	130110771	130111292	200
0101541	0100432	130110771	130111292	200
0101542	0100432	130111280	130111292	200
0101543	0100419	130111280	130111292	200
0101544	0100419	130111280	130111247	200
0101545	0100419	130111280	130111247	200
0101546	0100419	130112696	130111247	200
0101547	0100419	130112696	130111247	200
0101548	0100419	130112696	130111247	200
0101549	0100419	130112696	130111289	200
0101550	0100419	130112696	130111289	200
0101551	0100419	130112713	130111289	200
0101552	0100436	130112713	130111289	200
0101553	0100436	130112713	130111289	200
0101554	0100436	130112713	130111296	200
0101555	0100436	130112713	130111296	200
0101556	0100436	130111290	130111296	200
0101557	0100436	130111290	130111296	200
0101558	0100436	130111290	130111296	200
0101559	0100436	130111290	130111296	200
0101560	0100437	130111290	130111234	200
0101561	0100437	130111272	130111234	200
0101562	0100437	130111272	130111234	200



Corporation

4800 East Monument Street  
Baltimore, Maryland 21205

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: www.tenaxus.com

## Peel Strength Geocomposite Testing Report

ASTM F904\*

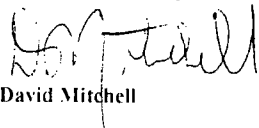
Product Tendrain 770-2  
Lot : 7  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101488	01/03/2002	1.20	1.35	
		1.01	1.15	
		1.02	1.25	
		1.10	1.30	
		1.08	1.26	Average
		0.09	0.09	Std. Deviation
		1.00	1.00	Specification (minimum)

Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

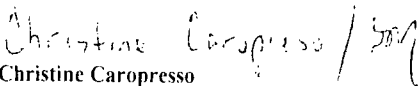
\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min.. for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

  
David Mitchell

Date 01/03/2002

Checked by

  
Christine Caropresso

Date 01/03/2002

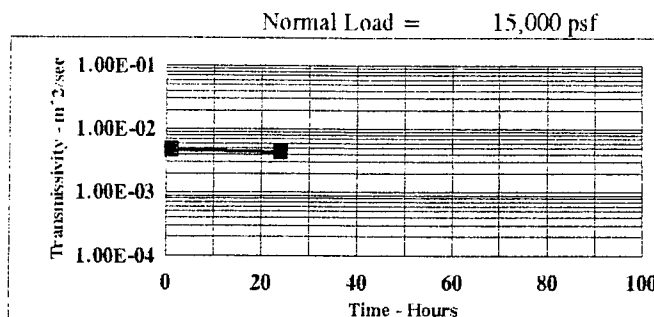
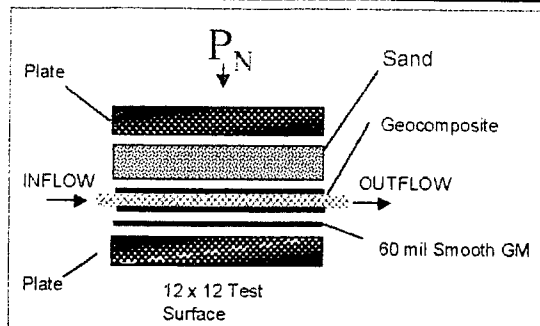
# TRANSMISSIVITY TEST RESULTS

## ASTM D-4716

**JLT**

Client: Tenax Corporation  
 Project: Pasco County Landfill  
 Material: Tendrain 770-2  
 Sample ID: Lot 7

Job Number: 01G2769-03  
 Date: 01/03/01  
 Tested By: DB  
 Checked By: JB



REPLICATE No.	GRADIENT	VOLUME cc	TIME secs	FLOW RATE cc/sec	TRANSMISSIVITY m²/sec	TRANSMISSIVITY gal/min/ft
<b>1 Hour</b>		Test Water Temp. =		15.0	Temp. Cor. Fact =	1.137
1	0.10	4025.00	30.65	131.32	4.90E-03	2.37
2	0.10	4027.00	30.70	131.17	4.89E-03	2.36
3	0.10	4030.00	30.72	131.18	4.89E-03	2.36
Average					4.90E-03	2.37
<b>24 Hours</b>		Test Water Temp. =		13.0	Temp. Cor. Fact =	1.200
1	0.10	3440.00	30.68	112.13	4.41E-03	2.13
2	0.10	3444.00	30.73	112.07	4.41E-03	2.13
3	0.10	3447.00	30.75	112.10	4.41E-03	2.13
Average					4.41E-03	2.13
<b>48 Hours</b>		Test Water Temp. =			Temp. Cor. Fact =	
1	0.10			ERR	ERR	ERR
2	0.10			ERR	ERR	ERR
3	0.10			ERR	ERR	ERR
Average					ERR	ERR
<b>72 Hours</b>		Test Water Temp. =			Temp. Cor. Fact =	
1	0.10			ERR	ERR	ERR
2	0.10			ERR	ERR	ERR
3	0.10			ERR	ERR	ERR
Average					ERR	ERR
<b>100 Hours</b>		Test Water Temp. =			Temp. Cor. Fact =	
1	0.10			ERR	ERR	ERR
2	0.10			ERR	ERR	ERR
3	0.10			ERR	ERR	ERR
Average					ERR	ERR

**J&L Testing Company, Inc.**

938 S. Central Ave., Canonsburg, Pa. Tel: 724-746-4441 Fax: 724-745-4261

## COMANCO ENVIRONMENTAL CORPORATION

7911 Professional Place, Tampa, Florida 33527

Phone (813)988-8829 Fax (813)988-3720


## SUBMITTAL CONTROL FORM

Project: **WEST PASCO COUNTY LANDFILL EXPANSION - CELLS A-3 AND SW-2**

Owner:	<u>Pasco County B.O.C.C.</u>	Project No.:	<u>01-063</u>	Project Manager:	<u>John Power</u>
Engineer:	<u>Camp Dresser &amp; McKee</u>	Project No.:	<u>6104-28936</u>	Project Manager:	<u>Daniel Strobbridge, Q.E.P.</u>
Contractor:	<u>Handex of Florida, Inc.</u>	Project No.:	<u>123477</u>	Project Manager:	<u>Gary L. Conaway, P.E.</u>
Subcontractor:	<u>COMANCO Environmental Corp.</u>	Project No.:	<u>010-848</u>	Project Manager:	<u>Pablo J. Rivera</u>

## COMPLETED BY CONTRACTOR:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature: Date: 02-13-02

Submittal Identifier:	<u>D-02274-014-A</u>	<input checked="" type="checkbox"/> Original Submittal	<input type="checkbox"/> Supplement
Submitted:	<u>February 13, 2002</u>		
No. of Copies:	<u>8</u>	<input type="checkbox"/> Resubmittal	<input type="checkbox"/> Information Only

Submittal Description: Geocomposite QA/QC Roll Certificates: Lot 8

Specification Identifier: 01300, 02274 Section 1.03 (A.9) and Section 2.03 (A)

Manufacturer: Tenax Corporation

Installer: COMANCO Environmental Corporation

## COMPLETED BY ENGINEER:

No. of Copies Received: \_\_\_\_\_

No. of Copies Returned: \_\_\_\_\_

Status:	<input type="checkbox"/> Code 1 - Approved	<input type="checkbox"/> Code 4 - Approved As Noted, Resubmit
	<input type="checkbox"/> Code 2 - Approved As Noted	<input type="checkbox"/> Code 5 - Not Approved
	<input type="checkbox"/> Code 3 - Approved As Noted, Confirm	<input type="checkbox"/> Code 6 - Comments Attached

Engineer Stamp or Remarks Area:

## SHOP DRAWING REVIEW

ENGINEER'S REVIEW		RESPONSE REQUIRED OF CONTRACTOR	
Approved <input checked="" type="checkbox"/>	Not Approved <input type="checkbox"/>	Confirm <input type="checkbox"/>	
Approved as Noted <input type="checkbox"/>	Comments Attached <input type="checkbox"/>	Resubmit <input type="checkbox"/>	

The Engineer's review of this shop drawing is limited to the review of dimensions, equipment and materials as presented in the Contract plans, specifications and for design concept. This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility of addressing any deviations from the Contract Documents. The Contractor is responsible for the details and dimensions of fabrication and manufacture, the means, methods, techniques, sequences or procedures of construction and performing his work in a safe manner.

CAMP DRESSER & MCKEE INC.

By AMSDate 3/1/02

**QUALITY CONTROL SUMMARY**

**TENAX Tendrain 7 70-2**

**Prepared for: Comanco Environmental Corporation**

**Date: January 3, 2002**

**Lot # 8**

Project: Pasco Landfill

Submitted to: Pablo Rivera  
7911 Professional Place  
Tampa, Florida 33637  
(813) 988-8829

## Table of Contents

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MQC of Geocomposite.....	4



4800 East Monument Street  
Baltimore, Maryland 21205

Office: 410-522-7000  
Fax: 410-522-7015

Order Line: (800) 356-8495  
Waste Mgt: (800) US-GRIDS

ATTN: Pablo Rivera

RE: Pasco Landfill  
Tendrain 7 70-2 (200' x 6.7')  
Lot # 8

January 2, 2002

Dear Pablo Rivera:

Tenax Corporation certifies the following roll numbers, 0101563, 0101564, 0101565, 0101566, 0101567, 0101568, 0101569, 0101570, 0101571, 0101572, 0101573, 0101574, 0101575, 0101576, 0101577, 0101578, 0101579, 0101580, 0101581, 0101582, 0101583, 0101584, 0101585, 0101586, 0101587, 0101588, 0101589, 0101590, 0101591, 0101592, 0101593, 0101594, 0101595, 0101596, 0101597, 0101598, 0101599, 0101600, 0101601, 0101602, 0101603, 0101604, 0101605, 0101606, 0101607, 0101608, 0101609, 0101610, 0101611, 0101612, 0101613, 0101614, 0101615, 0101616, 0101617, 0101618, 0101619, 0101620, 0101621, 0101622, 0101623, 0101624, 0101625, 0101626, 0101627, 0101628, 0101629, 0101630, 0101631, 0101632, 0101633, 0101634, 0101635, 0101636, of Tendrain 7 70-2, consisting of lot # 8 to be shipped to the above referenced project are in accordance with the geonet properties listed in the attached Tenax specifications: Those rolls were manufactured in accordance with the Tenax Manufacturing Quality Control / Quality Assurance Plan.

This MQC submittal consists of the following sections:

Section 2 contains the geonet Manufacturing Quality Control (MQC); Section 3 entails the MQC on the geotextile used for the manufacture of these geocomposites. Section 4 describes in detail all geocomposites roll numbers that constitute lot # 8, describe there respective geotextile roll numbers and geonet roll numbers, as well as geocomposite transmissivity and peel strength.

Respectfully submitted,

Tim Bauters, Ph.D.  
Quality Control Manager



# ENDRAIN 770-2

## DOUBLE-SIDED GEÓCOMPOSITE

Pasco LF, FL

The drainage geocomposite is comprised of a tri-planar geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming with the values and test methods listed below:

PROPERTIES	TEST METHOD	UNIT	VALUE	QUALIFIER
<b>GEONET CORE</b>				
Tensile Strength - MD	ASTM D4595	lb/ft (kN/m)	1000 (14.6)	c, Note 1, 4
Compressive Behavior (% Retained thickness)				
@50,000 psf (short term)	ASTM D1621	%	50	a, Note 2, 4
@25,000 psf (10,000 hours)		%	65	a, Note 4
Density	ASTM D1505	g/cm <sup>3</sup>	0.94	c, Note 4
Melt Flow Index	ASTM D1238	g/10 min.	1.0	d, note 4
Carbon Black Content	ASTM D4218	%	2.0	c, Note 4
Thickness	ASTM D5199	mils (mm)	300 (7.6)	c, Note 3, 4
<b>GEOTEXTILE</b>				
Apparent Opening Size (AOS)	ASTM D4751	US Sieve (mm)	70 (0.21)	b, Note 4
Weight	ASTM D3776	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	6 (203)	b, Note 4
Water Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (lpm/m <sup>2</sup> )	110 (4483)	b, Note 4
Permeability	ASTM D4491	cm/sec	0.2	b, Note 4
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.3	b, Note 4
Puncture Strength	ASTM D4833	lbs (N)	90 (400)	b, Note 4
Trapezoid Tear	ASTM D4533	lbs (N)	65 (290)	b, Note 4
Crab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	b, Note 4
@ Elongation	ASTM D4632	%	50	b, Note 4
Mullen Burst	ASTM D3786	psi (kPa)	325 (2241)	b, Note 4
UV Resistance @500 Hours	ASTM D4355	%	70	b, Note 4
<b>GEOCOMPOSITE</b>				
Roll Width		ft (m)	6.7 (2.0)	a, Note 5
Roll Length		ft (m)	200 (61)	a, Note 5
Ply Adhesion	ASTM F904 (modified)	lb/in (N/m)	1.0 (175)	c, Note 6
<b>HYDRAULIC BEHAVIOR OF GEOCOMPOSITE</b>				
Transmissivity - MD, ASTM D 4716-99 (m <sup>2</sup> /sec)				c, Notes 7
Gradient/Load:			15,000 psf (720 kPa)	
0.1			1.8x10 <sup>-3</sup>	

Qualifiers: a = Typical Value    b = Minimum Average Roll Value (MARV)  
c = Minimum Value    d = Maximum Value

### NOTES:

1. Tensile properties tested by manufacturer every 50,000 square feet of product per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in. x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness measured by manufacturer every 50,000 square feet of product per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination. Geotextile is tested at the industry standard frequency.
5. Roll dimensions are measured at the time of manufacture.
6. Ply Adhesion is tested by the manufacturer every 100,000 sf of production per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
7. Geocomposite transmissivity measured by manufacturer every 100,000 square feet of product as per ASTM D4716-99 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours.



Corporation

**4800 East Monument Street  
Baltimore, Maryland 21205**

Office: (410) 522-7000 Order Line: (800) 356-8495  
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS  
Web Site: [www.tenaxus.com](http://www.tenaxus.com)

### Geonet MQC Test Results

**Product** TD 7  
**Project** Pasco Landfill  
**Lot #** 8  
**Dimensions** 6.7' x 200'  
**Testing Lab** Tenax Corp.

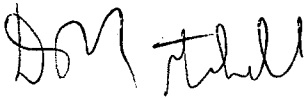
Geonet Roll	Date Tested	Thickness	Density	CarbonBlack	MFI	Tensile Strength
		ASTM D5199 (mils)	ASTM D1505-98 (g/cm3)	ASTM D4218-96 (%)	ASTM D1238-00 (g/10min)	ASTM D4595-94 (lb/ft)
0100433	12/27/2001	325	0.950	2.50	0.410	1968
0100436	12/27/2001	325	0.952	2.63	0.400	1820
0100438	12/29/2001	337	0.950	2.46	0.420	1895
0100441	12/29/2001	328	0.952	2.55	0.445	1884
0100443	12/29/2001	327	0.951	2.36	0.427	1925

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505-98 (g/cm3)	CarbonBlack ASTM D4218-96 (%)	MFI ASTM D1238-00 (g/10min)	Tensile Strength ASTM D4595-94 (lb/ft)
Average		328	0.951	2.50	0.420	1898
Standard Dev.		5	0.001	0.10	0.017	55
Specifications		300	0.940	2.00	< 1	1000

#### Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0100433	60.00	50
	0100436	59.70	50
	0100436	56.52	50
	0100438	59.00	50
	0100441	57.00	50
	0100443	58.00	50
Average (Specs)		58.37	50

Tested by

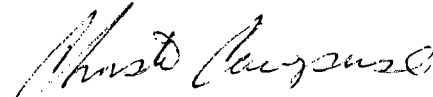


David Mitchell

Date

01/03/2002

Checked by



Christine Caropresso

Date

01/03/2002

Date: 12/18/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: Terrence Singletary

ROLL #

130110726	130111285	130112709
130110786	130111291	130112710
130110787	130111309	130112711
130111248	130112683	130112712
130111249	130112685	130112713
130111250	130112687	130112714
130111251	130112689	130112715
130111253	130112690	130112716
130111260	130112691	130112717
130111261	130112615	130112718
130111265	130112616	130112719
130111267	130112617	130112720
130111268	130112618	130112721
130111269	130112693	130112722
130111270	130112696	130112723
130111279	130112708	130112724
130112688	130111226	130111236
130112692	130111235	130111237



GSE Corporation of America

## Roll Test Data Summary English Units

Product: NW6

Roll # and Lot: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/20

Roll No.	Min. gage Line Weight	Min. Lines Per Inch	Cord Strength		Cord Elongation		Cord Tensile Strength		Twist Per Inch	Min. Knot Strength	Ignition Extinguishing No.	Tensile Strength	
	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT
	lb/yd	inches	MPa (lb/sq in)	MPa (lb/sq in)	MPa (lb/sq in)	MPa (lb/sq in)	MPa (lb/sq in)	lb	inches	lb	lb	lb	lb
130111253	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5



QPL Data Entry Policy

## Roll Test Data Summary - English Units

Product: NW6

Form Code: FBR0608100

Roll Width: 15.0 feet

Print Date: 11/27/20

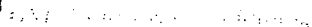
Roll #	Min. per Foot (lbs)	Test Force (lbs)	Total Strength		Tensile Strength		Tear Strength		Crease Strength	Vertical Pull Strength	Equivalent CT Number	Compression	
			INSTR 500	INSTR 150	INSTR 500	INSTR 150	INSTR 500	INSTR 150	INSTR 500	INSTR 150		INSTR 500	INSTR 150
	(psi)	(psi)	MP (lbs)	CP (lbs)	MP (psi)	CP (psi)	MP (psi)	CP (psi)	(psi)	(psi)	(mm)	(psi)	(psi)
130111260	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111261	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



Geophysical Engineering

## Roll Test Data Summary - English Unit

Roll #	NW6		Roll Center FBR0608100		Roll Radius 15.0 feet		Roll Date 11/27/20						
Roll #	Wagon Length	Wagon Width	Roll Length	Roll Width	Roll Length	Roll Width	Roll Length	Roll Width					
Roll #	Wagon Length	Wagon Width	Roll Length	Roll Width	Roll Length	Roll Width	Roll Length	Roll Width					
Roll #	Wagon Length	Wagon Width	Roll Length	Roll Width	Roll Length	Roll Width	Roll Length	Roll Width					
Roll #	Wagon Length	Wagon Width	Roll Length	Roll Width	Roll Length	Roll Width	Roll Length	Roll Width					
130111265	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



3. 07. 2006: FBR0608100

15.0 feet

11/27/20

No.	Main Stem		Branch		Leaf		Flower		Seedling		Seedling		Seedling	
	Length	Width	Length	Width	Length	Width	Length	Width	Length	Width	Length	Width	Length	Width
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
130111267	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5	
130111268	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5	
130111269	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5	
130111270	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5	





1 of 1 pages

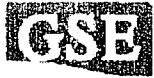
# Roll Test Data Summary English Units

Sheet NW6		Data File: FBR0608100				Roll Depth 15.0 feet				Roll Date: 11/27/20			
Roll ID	Roll Type	Roll Weight	Roll Length	Roll Width	Roll Thickness	Roll Volume	Roll Area	Roll Perimeter	Roll Surface Area	Roll Volume	Roll Area	Roll Perimeter	Roll Surface Area
130111279	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5

And You Have Summer English Class

11/27/20

Accession	Wave- Length	Exposure Time	Grating Slit Width	Grating Slit Depth	Grating Slit Angle	Grating Slit Period	Grating Slit Width	Grating Slit Depth	Grating Slit Angle	Grating Slit Period	Grating Slit Width	Grating Slit Depth	Grating Slit Angle	Grating Slit Period
130111285	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4	



GSE Engineering Technology

## Roll Test Data Summary - English Units

Truck ID: NW6

Truck Order: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/20

Roll No.	Max. Roll Length (in)	Roll Area (sq ft)	Roll Strength (lb/ft)	Roll Length (in)	Roll Area (sq ft)	Roll Strength (lb/ft)	Roll Length (in)	Roll Area (sq ft)	Roll Strength (lb/ft)	Roll Length (in)	Roll Area (sq ft)	Roll Strength (lb/ft)	Roll Length (in)	Roll Area (sq ft)	Roll Strength (lb/ft)
130111291	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4		



GSE Non-woven Technicals

## Roll Test Data Summary - English Units

Product: NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/20

Roll No.	Manufacturer Unit Area	Thickness	Tensile Strength		Tensile Elongation		Tear Elongation		Tensile Strength	Modulus Strength	Apparent Opening Size	Leakage Permeability	
	ESTM D 5191	ESTM D 5199	ESTM D 4602		ESTM D 5033		ESTM D 5033		ESTM D 5033	ESTM D 5086	ESTM D 7500	ESTM D 1993	
	(m <sup>2</sup> /yd <sup>2</sup> )	(mil)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(psi)	(psi)	(mm)	(cm <sup>3</sup> /s)	
130111309	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



GSE Systems Engineering

## Roll Test Data Summary - English Units

Product: NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/17/20

Roll No.	Max. Roll Length	Roll Width	Roll Strength	Roll Length (in)	Roll Width (in)	Roll Strength (lb)	Roll Length (in)	Roll Width (in)	Roll Strength (lb)	Roll Length (in)	Roll Width (in)	Roll Strength (lb)	Roll Length (in)	Roll Width (in)	Roll Strength (lb)
130112615	7.5	89	241	261	103	128	106	143	127	364	0.180	1.6	0.4		
130112616	7.5	89	241	261	103	128	106	143	127	364	0.180	1.6	0.4		
130112617	7.5	89	241	261	103	128	106	143	127	364	0.180	1.6	0.4		
130112618	7.5	89	241	261	103	128	106	143	127	364	0.180	1.6	0.4		



Geotechnical Engineering

## Roll Test Data Summary - English Units

Product: NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/17/20

Roll No.	Waveform Length	Roll Length	Roll Strength		Roll Elongation		Roll Elongation Rate		Roll Elongation Length	Roll Elongation Strength	Apparent Elongation (%)	Roll Elongation Rate	
	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED
	(inches)	(inches)	MP (lb/ft), CP (lb/ft)	MP (lb/ft), CP (lb/ft)	MP (lb/ft), CP (lb/ft)	MP (lb/ft), CP (lb/ft)	MP (lb/ft), CP (lb/ft)	MP (lb/ft), CP (lb/ft)	(inches)	(lb/ft)	(inches)	(inches)	(inches)
130112683	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4
130112685	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4



GSE Systems Inc. (GSE)

## Roll Test Data Summary - English Units

Product: NW6      Item Code: FBR0608100      Roll Width: 15.0 feet      Test Date: 12/17/20

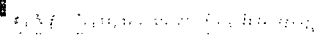
Roll #	Machine Line Code	Block Size	Roll Strength	Roll Length (in)	Roll Length (ft)	Roll Weight (lb)	Roll Weight (kg)	Roll Length (in)	Roll Length (ft)	Roll Weight (lb)	Roll Weight (kg)	Roll Length (in)	Roll Length (ft)
ESTM Roll #	ESTM Line	ESTM Block	ESTM Strength	ESTM Length	ESTM Length	ESTM Weight	ESTM Weight	ESTM Length	ESTM Length	ESTM Weight	ESTM Weight	ESTM Length	ESTM Length
(in)	(in)	(in)	(lb)	(in)	(ft)	(lb)	(kg)	(in)	(ft)	(lb)	(kg)	(in)	(ft)
130112687	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4

1. What is the purpose of the document?  
 2. What are the main findings of the study?  
 3. What are the implications of the findings?  
 4. What are the limitations of the study?  
 5. What are the conclusions of the study?

12/17/20

Part No.	Major End Area	Thickness	Joint Strength		Joint Elongation		Joint Tensile Strength		Flexural Strength	Ultimate Flex. Strength	Equivalent Moment Area	Longitudinal Stiffness	
	INSTRUMENTED	INSTRUMENTED	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.	EXP. MEAS.
	in. <sup>2</sup>	inches	MPa/ksi	in./in.	MPa/ksi	in./in.	MPa/ksi	in./in.	ksi	psi	in <sup>4</sup>	in <sup>4</sup> /in.	in <sup>4</sup> /in.
130112689	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4
130112690	6.4	85	215	227	70	120	98	117	124	342	0.180	1.7	0.4
130112691	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4



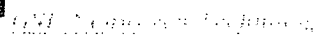


44-38861-2457 FBI0608100

150 feet

12/16/20

Accession	Waveform	Interference	Length (bits)	Length (samples)	Length (bytes)	Frequency	Amplitude (bits)	Amplitude (samples)	Amplitude (bytes)	Power (bits)	Power (samples)	Power (bytes)	
130112693	6.2	89	208	215	97	115	98	151	111	352	0.212	17	0.4



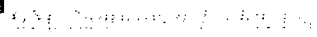
Good Day Home Summer English 1000

FILED 0608100

Depth to water 15.0 feet

12/16/20

Material	Modulus	Poisson's	Tensile Strength		Tensile Elongation		Tensile Yield Strength		Proof Stress	Modulus Residual	Apparent Expansion (%)	Thermal Shock Factor (1/°C)	
	E (GPa)	$\nu$	UTM (MPa)	UTM (MPa)	UTM (%)	UTM (%)	UTM (MPa)	UTM (MPa)	UTM (MPa)	UTM (GPa)	UTM (%)	UTM (1/°C)	
	(ksi)	(in/in)	(MPa)	(ksi)	(%)	(%)	(MPa)	(ksi)	(MPa)	(ksi)	(%)	(in/in)	
130112696	6.2	0.212	208	215	97	115	98	151	111	352	0.212	17	0.4



Roll No. Date: \_\_\_\_\_ English: \_\_\_\_\_

12/16/20

Part No.	Main Part Dimensions		Main Part Strength		Main Part Weight		Main Part Length		Main Part Width		Main Part Thickness		Part No.
	Length	Width	Height	Weight	Length	Width	Height	Weight	Length	Width	Height	Weight	
130112708	6.5	88	240	242	92	111	102	147	121	334	0.212	1.7	0.4
130112709	6.5	88	240	242	92	111	102	147	121	334	0.212	1.7	0.4
130112710	6.5	88	240	242	92	111	102	147	121	334	0.212	1.7	0.4
130112711	6.2	89	208	215	97	115	98	151	111	352	0.212	1.7	0.4
130112712	6.5	88	240	242	92	111	102	147	121	334	0.212	1.7	0.4
130112713	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112714	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112715	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112716	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112717	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112718	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112719	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112720	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112721	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112722	6.6	88	199	237	98	116	111	130	126	356	0.212	1.7	0.4
130112723	6.9	90	244	229	87	114	106	122	121	392	0.212	1.7	0.4
130112724	6.9	90	244	229	87	114	106	122	121	392	0.212	1.7	0.4



GSE America, Inc. Indianapolis

## Roll Test Data Summary - English Units

Product: NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Roll Date: 12/17/20

Roll No.	Max. Pen. Limit (in)	Max. Temp. (°F)	Tensile Strength		Tensile Elongation		Tear Resistance		Dynamic Strength	Modulus Strength	Impact Strength (ft-lb)	Tensile Elongation	
	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED
	(in)	(°F)	MPa (lb/sq in)	MPa (lb/sq in)	% Elongation	% Elongation	MPa (lb/sq in)	MPa (lb/sq in)	(psi)	(psi)	(ft-lb)	% Elongation	(ft-lb)
130112688	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4



GSE Engineering Technology

## Roll Test Data Summary - English Units

Product: NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 12/17/20

Item No.	Min. Roll Length (in)	Roll Weight (lbs)	Roll Strength (lb/ft)	Roll Length (ft)	Roll Weight (lb)	Roll Strength (lb/ft)	Roll Length (ft)	Roll Weight (lb)	Roll Strength (lb/ft)	Roll Length (ft)	Roll Weight (lb)	Roll Strength (lb/ft)	Roll Length (ft)	Roll Weight (lb)	Roll Strength (lb/ft)
130112692	6.4	85	215	227	90	120	98	117	124	342	0.180	1.7	0.4		



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111226	6.3	87	201	186	93	125	151	162	121	338	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111235	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5
130111236	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5
130111237	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5



130110726

# Roll Test Data Summary - English Units

Subject: NW6		Item Code: FBR0608100				Roll Mark: 15.0 feet		Test Date: 11/20/20	
Roll No.	Min. Roll Length	Roll Length	Roll Strength	Roll Elongation	Roll Tensile Strength	Roll Tensile Strength	Roll Tensile Strength	Roll Tensile Strength	Roll Tensile Strength
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110726	6.7	99	201	212	101	124	104	146	126
130110									





03/20/2020 10:00 AM

# Roll Test Data Summary English Units

Project: NW6      Item Code: FBR0608100      Roll Depth: 15.0 feet      Date: 11/20/20

Roll ID	Moisture		Tensile Strength		Roll Tensile Strength		Tensile Strength		Modulus		Density		Remarks
	Initial		Final		Initial		Final		Initial		Final		
	IN/100 lbs		IN/100 lbs		IN/100 lbs		IN/100 lbs		IN/100 lbs		IN/100 lbs		
	inches	inches	MPa (lbs)	MPa (lbs)	MPa (lbs)	MPa (lbs)	MPa (lbs)	MPa (lbs)	gpa	gpa	lb/cu ft	lb/cu ft	
130110786	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6
130110787	6.6	99	226	215	88	113	90	119	123	368	0.212	2.3	0.6



Global Engineering Solutions

## Roll Test Data Summary - English Units

Product: NW6		Item Code: FBR0608100				Roll Width: 15.0 feet				Roll Date: 11/27/20			
Roll #	Max. Roll Length	Roll Length	Roll Strength		Roll Tension		Roll Tear Strength		Roll Tear Strength	Roll Burst Strength	Roll Burst Strength	Roll Burst Strength	Roll Burst Strength
ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED	ESTIMATED
Roll #	Roll Length	Roll Length	Roll Strength	Roll Strength	Roll Tension	Roll Tension	Roll Tear Strength	Roll Tear Strength	Roll Burst Strength	Roll Burst Strength	Roll Burst Strength	Roll Burst Strength	Roll Burst Strength
130111248	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111249	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111250	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5
130111251	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5

Date: 12/19/2001

Number of Rolls 54

FBR0608100

SO#21538

APPROVED BY: Crystal L. Gore

ROLL #

130110767	130111258	130111289
130110768	130111259	130111290
130110769	130111262	130111283
130110770	130111263	130111284
130110771	130111264	130111292
130110772	130111266	130111294
130110773	130111271	130111296
130110774	130111272	130111297
130110777	130111273	130111298
130110779	130111274	130111299
130111243	130111275	130111300
130111244	130111276	130111301
130111246	130111277	130111304
130111247	130111278	130111305
130111234	130111280	130111306
130111238	130111288	130111307
	130111314	130111308
	130111315	130111310
		130111311
		130111312



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/20/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130110767	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110768	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110769	6.5	97	189	230	91	121	104	129	120	376	0.212	2.2	0.6
130110770	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110771	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110772	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110773	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6
130110774	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/20/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130110777	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6			Item Code: FBR0608100			Roll Width: 15.0 feet			Test Date: 11/20/2				
Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd2)	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130110779	6.6	97	201	238	94	120	117	161	128	362	0.212	2.2	0.6



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111243	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111244	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111246	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5
130111247	6.9	90	217	245	92	115	130	173	117	356	0.212	2.1	0.5





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111234	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111238	6.9	92	231	234	93	133	123	116	128	372	0.212	2.1	9.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111258	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5
130111259	6.6	86	216	246	96	122	144	150	126	376	0.212	2.1	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product : NW6*

*Item Code: FBR0608100*

*Roll Width: 15.0 feet*

*Test Date: 11/27/2*

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111262	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111263	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5
130111264	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



*GSE Nonwoven Technology*

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111266	6.5	83	228	230	100	125	141	158	121	332	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111271	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111272	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111273	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111274	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111275	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111276	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5
130111277	6.6	84	237	244	101	111	132	171	124	375	0.212	2.1	0.5
130111278	6.6	84	228	230	100	125	132	171	124	375	0.212	2.1	0.5



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111280	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111288	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111289	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111290	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4





GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111283	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4
130111284	6.9	89	246	230	95	125	141	162	115	358	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-I)	(cm/sec)
130111292	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## *Roll Test Data Summary - English Units*

*Product :* NW6

*Item Code:* FBR0608100

*Roll Width:* 15.0 feet

*Test Date:* 11/27/2

<i>Roll No.</i>	<i>Mass per Unit Area</i>	<i>Thickness</i>	<i>Grab Strength</i>		<i>Grab Elongation</i>		<i>Trap Tear Strength</i>		<i>Puncture Strength</i>	<i>Mullen Burst Strength</i>	<i>Apparent Opening Size</i>	<i>Permittivity</i>	<i>Permeability</i>
	<i>ASTM D 5261</i>	<i>ASTM D 5199</i>	<i>ASTM D 4632</i>		<i>ASTM D 4632</i>		<i>ASTM D 4533</i>		<i>ASTM D 4833</i>	<i>ASTM D 3786</i>	<i>ASTM D 4751</i>	<i>ASTM D 4491</i>	
	<i>(oz/yd<sup>2</sup>)</i>	<i>(mils)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>MD (%)</i>	<i>CD (%)</i>	<i>MD (lbs)</i>	<i>CD (lbs)</i>	<i>(lbs)</i>	<i>(psi)</i>	<i>(mm)</i>	<i>(sec-1)</i>	<i>(cm/sec)</i>
130111294	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111296	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111297	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111298	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111299	6.6	99	242	250	96	115	124	136	119	360	0.212	1.8	0.4
130111300	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111301	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



*GSE Nonwoven Technology*

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111304	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111305	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111306	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111307	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4
130111308	6.7	90	231	231	92	120	101	120	128	357	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-l)	(cm/sec)
130111310	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111311	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111312	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4



GSE Nonwoven Technology

## Roll Test Data Summary - English Units

Product : NW6

Item Code: FBR0608100

Roll Width: 15.0 feet

Test Date: 11/27/2

Roll No.	Mass per Unit Area	Thickness	Grab Strength		Grab Elongation		Trap Tear Strength		Puncture Strength	Mullen Burst Strength	Apparent Opening Size	Permittivity	Permeability
	ASTM D 5261	ASTM D 5199	ASTM D 4632		ASTM D 4632		ASTM D 4533		ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491	
	(oz/yd <sup>2</sup> )	(mils)	MD (lbs)	CD (lbs)	MD (%)	CD (%)	MD (lbs)	CD (lbs)	(lbs)	(psi)	(mm)	(sec-1)	(cm/sec)
130111314	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4
130111315	7.0	99	231	243	103	116	109	134	125	368	0.212	1.8	0.4

# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	8
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101563	0100437	130111272	130111262	200
0101564	0100437	130111272	130111262	200
0101565	0100437	130111272	130111262	200
0101566	0100437	130112693	130111262	200
0101567	0100437	130112693	130111262	200
0101568	0100437	130112693	130111308	200
0101569	0100437	130112693	130111308	200
0101570	0100434	130112693	130111308	200
0101571	0100434	130111299	130111308	200
0101572	0100434	130111299	130111308	200
0101573	0100434	130111299	130111308	200
0101574	0100434	130111299	130111246	200
0101575	0100434	130111299	130111246	200
0101576	0100434	130111288	130111246	200
0101577	0100434	130111288	130111246	200
0101578	0100434	130111288	130111246	200
0101579	0100435	130111288	130111259	200
0101580	0100435	130111288	130111259	200
0101581	0100435	130111253	130111259	200
0101582	0100435	130111253	130111259	200
0101583	0100435	130111253	130111259	200
0101584	0100435	130111253	130112718	200
0101585	0100435	130111253	130112718	200
0101586	0100435	130111693	130112718	200
0101587	0100435	130111693	130112718	200
0101588	0100438	130111693	130112718	200
0101589	0100438	130111693	130112711	200
0101590	0100438	130111693	130112711	200
0101591	0100438	130111226	130112711	200
0101592	0100438	130111226	130112711	200
0101593	0100438	130111226	130112711	200
0101594	0100438	130111226	130112708	200
0101595	0100438	130111226	130112708	200
0101596	0100439	130112722	130112708	200
0101597	0100439	130112722	130112708	200
0101598	0100439	130112722	130112708	200
0101599	0100439	130112722	130112714	200
0101600	0100439	130112710	130112714	200
0101601	0100439	130112710	130112714	200
0101602	0100439	130112710	130112714	200
0101603	0100439	130112710	130112714	200
0101604	0100439	130112710	130112709	200
0101605	0100440	130112716	130112709	200
0101606	0100440	130112716	130112709	200
0101607	0100440	130112716	130112709	200
0101608	0100440	130112716	130112709	200
0101609	0100440	130112716	130112689	200



# TENAX CORPORATION

## GEOCOMPOSITE REPORT

PRODUCT :	Tendrain 770-2
JOB:	Pasco Landfill
LOT #:	8
DATE:	01/02/02

COMPOSITE #	JUMBO ROLL #	TEXTILE #	TEXTILE #	Length (ft)
0101610	0100440	130110787	130112689	200
0101611	0100440	130110787	130112689	200
0101612	0100440	130110787	130112689	200
0101613	0100441	130110787	130112690	200
0101614	0100441	130110787	130112690	200
0101615	0100441	130111166	130112690	200
0101616	0100441	130111166	130112690	200
0101617	0100441	130111166	130112690	200
0101618	0100441	130111166	130112724	200
0101619	0100441	130111166	130112724	200
0101620	0100441	130112720	130112724	200
0101621	0100442	130112720	130112724	200
0101622	0100442	130112720	130112724	200
0101623	0100442	130112720	130111192	200
0101624	0100442	130112720	130111192	200
0101625	0100442	130112712	130111192	200
0101626	0100442	130112712	130111192	200
0101627	0100442	130112712	130111192	200
0101628	0100442	130112712	130112717	200
0101629	0100442	130112712	130112717	200
0101630	0100443	130112715	130112717	200
0101631	0100443	130112715	130112717	200
0101632	0100443	130112715	130112717	200
0101633	0100443	130112715	130111185	200
0101634	0100443	130112715	130111185	200
0101635	0100443	130112723	130111185	200
0101636	0100443	130112723	130111185	200



Corporation

4800 East Monument Street  
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Web Site: [www.tenaxus.com](http://www.tenaxus.com)

## Peel Strength Geocomposite Testing Report

### ASTM F904\*

Product Tendrain 770-2  
Lot : 8  
Roll Size 6.7' x 200'  
Project Pasco Landfill  
Testing Lab Tenax Corp.

Geocomposite Roll #	Date Tested	SideA (lb/inch)	SideB (lb/inch)	
0101563	12/31/2001	1.00	1.14	
		1.15	1.25	
		1.11	1.27	
		1.45	1.08	
		1.33	1.17	
		1.21	1.18	Average
		0.18	0.08	Std. Deviation
		1.00	1.00	Specification (minimum)

\*Please note that the above values are representative of the laminated area of the roll. Please allow 3% of unbonded surface on beginning and end of the roll due to manufacturing constraints. In addition to 4 inches (approximately) on each side of the roll left unbonded to allow for overlapping on the sides.

\*Ply adhesion is tested by the manufacturer every 100,000 sq.ft. of production per modified ASTM F 904, with a 2 inch wide (5 longitudinal ribs) by 10 inch long strip. The geotextile bonded to the geonet is pulled apart at a peeling rate of 12 in./min.. for at least 4 inches of peeling distance. The reported value is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width, and maintain a 1 foot margin from both edges of the roll.

Tested by

David Mitchell

Date 01/03/2002

Checked by

Christine Caropresso

Date 01/03/2002



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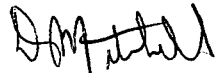
Web Site: [www.tenaxus.com](http://www.tenaxus.com)

**Transmissivity Test Data**  
**ASTM D 4716-95**

Product	Tendrain 770-2	TEST CONFIGURATION					
Lot #	8	Plate					
Roll Size	6.7' x 200'	Sand					
Project	Pasco Landfill	Tendrain 770-2					
Specimen Size	12" x 14"	Geomembrane					
Testing Lab	Tenax Corp.	Plate					

Geocomposite Roll	Testing Date	Load (psf)	Seating Period (hrs)	Gradient	Transmissivity (m2/sec)	Specification (m2/sec)
0101563	12/30/2001	15000	1	0.1	3.29E-03	1.80E-03

Tested by

  
David Mitchell

Date 01/03/2002

Checked by

  
Christine Caropresso

Date 01/03/2002