

WELD REGISTRY

Project name: Resolution Island				Project # : ZTG-03-23		
Localization : Resolution Island, Nunavut						
C.Q. Technician : Denis Bolduc et Martin Fontaine				Page: 1 of 2		
Weld NO.	Date	LENGTH	TECH.	Welder #	Calib #	PSI
2/3	23-août	14,2	Denis B.	W5	1	34
3/4	23-août	14,2	Denis B.	W5	1	32
4/5	23-août	14,2	Denis B.	W5	1	32
5/6	23-août	14,5	Denis B.	W5	2	32
6/7	23-août	10,1	Denis B.	W5	2	32
7/8	23-août	6,85	Denis B.	W5	2	32
2/10	24-août	14,3	Denis B.	W5	3	32
9/12	24-août	5,2	Denis B.	W5	3	30
10/11	24-août	7,5	Denis B.	W5	3	30
9/10/11/12	24-août	15	Denis B.	W5	4	30 / 30 / 30
1 / 7, 9, 2...5	24-août	53	Denis B.	W5	4	28/28/28/28/28/28
1/13	27-août	48,2	Denis B.	W5	5	36
13/14	27-août	48,8	Denis B.	W5	5	36
14/15	27-août	49,2	Denis B.	W5	6	36
15/16	29-août	50	Denis B.	W5	7	36
16/17/18	29-août	50	Denis B.	W5	7	34/34/34
17/18	29-août	6,85	Denis B.	W5	7	34
17/18/19	29-août	50	Denis B.	W5	8	32/32/32
19/20	01-sept	28	Martin F.	W5	9	32
21/27	01-sept	6,85	Martin F.	W5	9	30
22/28	02-sept	6,85	Martin F.	W5	11	30
23/29	03-sept	6,85	Martin F.	W5	13	30
24/27	01-sept	6,85	Martin F.	W5	9	30
25/28	02-sept	6,85	Martin F.	W5	11	28
26/29	03-sept	6,85	Martin F.	W5	13	28
19, 20 / 21, 27, 24	01-sept	63	Martin F.	W5	10	28/28/28/26
21, 27, 24 / 22, 28, 25	02-sept	65	Martin F.	W5	12	34/34/34
22, 28, 25 / 23, 29, 26	03-sept	68	Martin F.	W5	14	34/34/32
23, 29, 26 / 30	11-sept	65	Denis B.	W5	15	32/32/32
30/31	11-sept	65	Denis B.	W5	15	32
32/48	11-sept	6,85	Denis B.	W5	16	32
31/32/48	11-sept	68	Denis B.	W5	16	32/30
33/39	12-sept	24	Denis B.	W5	17	30
39/40	12-sept	18	Denis B.	W5	17	30
40/41	12-sept	15	Denis B.	W5	17	30
41/42	12-sept	13	Denis B.	W5	17	30
42/43	12-sept	11	Denis B.	W5	17	30
43/44	12-sept	10	Denis B.	W5	17	28
44/45	12-sept	10	Denis B.	W5	17	28
46/47	12-sept	6,85	Denis B.	W5	17	28
45/ 46, 47	12-sept	10	Denis B.	W5	17	26/26

WELD REGISTRY

[illegible]

II GEOMEMBRANE MANUFACTURERS QUALITY CONTROL

Chevron Phillips

4/23/2003 7:33

PAGE 1/1

RightFax



CoA Date: 04/23/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNO
WESTFIELD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86358133
PO #:
Weight: 190700 LB
Ship Date: 04/23/2003
Package: BULK
Mode: Hopper Car
Car #: CHVX898267

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8230089

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.090	g/10ml
HLMI Flow Rate	ASTM D1238	11.10	g/10mi
Density	ASTM D1505	0.9370	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Paul S. Newbold
Sr. Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-269-4799



CoA Date: 05/01/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNO
WESTFIELD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86362976
PO #:
Weight: 187800 LB
Ship Date: 05/01/2003
Package: BULK
Mode: Hopper Car
Car #: PSPX005134

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8230099

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.070	g/10mi
HLMI Flow Rate	ASTM D1238	11.90	g/10mi
Density	ASTM D1505	0.9380	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Paul S. Newbold
Sr. Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799



CoA Date: 06/05/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNO
WESTFIELD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86386906
PO #:
Weight: 182600 LB
Ship Date: 06/05/2003
Package: BULK
Mode: Hopper Car
Car #: GOCX056710

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8230486

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.080	g/10mi
HLMI Flow Rate	ASTM D1238	10.90	g/10mi
Density	ASTM D1505	0.9370	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Paul S. Newbold
Sr. Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799



Lining Technology, Inc.

Roll Test Data Report

Roll No. 103121057

ROLL IDENTIFICATION

Roll Number	103121057
Product Name	HDT060A000
Production Date	5/16/2003
Length $\pm$ (+/- 1%)	520 feet 158 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	11,700 sq. feet 1,088 sq. meters
Weight	3,830 pounds 1,737 kilograms

RESIN INFORMATION

Lot Number	8230089
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 English	Minimum Metric	Test Results English	Results Metric
Thickness, mil (mm)	ASTM D 5894					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, psi (N/cm) - TD		every 4th	130	(228)	159	(278)
- M D		every 4th	130	(228)	153	(267)
Break Strength, psi (N/cm) - TD		every 4th	90	(158)	193	(339)
- M D		every 4th	90	(158)	194	(340)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		16	
- M D	(33 mm)	every 4th	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		543	
- M D	(51 mm)	every 4th	150		557	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	53	(236)
- M D		every 4th	42	(187)	54	(241)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	108	(478)	150	(667)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No. 30461
 Customer Name Z-Tech/Geogard
 Project Name Z-Tech/Geogard-Ref R127371961
 Location CPU- Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03



GSE

Lining Technology, Inc.

Roll Test Data Report

Roll No. 103121191

ROLL IDENTIFICATION

Roll Number	103121191
Product Name	HDT080A000
Production Date	5/26/2003
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	3,980 pounds 1,805 kilograms

RESIN INFORMATION

Lot Number	8230099
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

<u>Physical Property</u>	<u>Test Method</u>	<u>Test Frequency</u>	<u>Customer Minimum English</u>	<u>Customer Minimum Metric</u>	<u>Test Results English</u>	<u>Test Results Metric</u>
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 D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	172	(300)
- M D		every 4th	130	(228)	170	(297)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	220	(384)
- M D		every 4th	90	(158)	199	(347)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		16	
- M D	(33 mm)	every 4th	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		623	
- M D	(51 mm)	every 4th	150		561	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- M D		every 4th	42	(187)	59	(261)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	108	(478)	157	(700)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.948	
Carbon Black Content, %	ASTM D 1603"					
		every 4th	2.0		2.8	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No. 30461
Customer Name Z-Tech/Geogard
Project Name Z-Tech/Geogard-Ref R127371961
Location CPU- Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03





Roll Test Data Report

Lining Technology, Inc.

Roll No. 103121194

ROLL IDENTIFICATION			RESIN INFORMATION		
Roll Number	103121194		Lot Number	8230099	
Product Name	HDT060A000		Type	K306	
Production Date	5/26/2003		Supplier	Phillips	
Length $\approx$ (+/- 1%)	520 158	feet meters	GSE RESIN TEST DATA		
Width (Nominal)	22.5 6.9	feet meters	Property	Test Method	Results
Sheet Area	11,700 1,086	sq. feet sq. meters	Density, g/cc	ASTM D 1505	0.938
Weight	3,995 1,812	pounds kilograms	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)	63 (1.6
Minimum		every roll	54	(1.4)	57 (1.4
Tensile Properties:	ASTM D638, Type IV / D6693				
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	170 (298
- M D		every 4th	130	(228)	165 (289
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	200 (349
- M D		every 4th	90	(158)	197 (345
Yield Elongation, % - TD	gauge length = 1.3"	every 4th		13	16
- M D	(33 mm)	every 4th		13	17
Break Elongation, % - TD	gauge length = 2.0"	every 4th		150	541
- M D	(51 mm)	every 4th		150	538
Tear Resistance, lb. (N)	ASTM D 1004				
- TD		every 4th	42	(187)	57 (252
- M D		every 4th	42	(187)	57 (253
Puncture Resistance, lb. (N)	ASTM D 4833				
		every 4th	108	(478)	159 (706
Density, g/cc	ASTM D 1505				
		every 4th		0.940	0.949
Carbon Black Content, %	ASTM D 1603*				
		every 4th		2.0	2.8
Carbon Black Dispersion	ASTM D 5596				
Views In Cat1 - Cat2		every 4th		9	10
Asperity Height	GRI GM 12				
Average (mils) - Side A		every 2nd		10	21

Order No. 30461
 Customer Name Z-Tech/Geogard
 Project Name Z-Tech/Geogard-Ref R127371961
 Location CPU- Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev - - 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 103121552

ROLL IDENTIFICATION			RESIN INFORMATION		
Roll Number	103121552		Lot Number	8230486	
Product Name	HDT060A000		Type	K306	
Production Date	6/18/2003		Supplier	Phillips	
Length $\approx (+/- 1\%)$	520 156	feet meters	GSE RESIN TEST DATA		
Width (Nominal)	22.5 6.9	feet meters	Property	Test Method	Results
Sheet Area	11,700 1,086	sq. feet sq. meters	Density, g/cc	ASTM D 1505	0.937
Weight	3,945 1,789	pounds kilograms	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 D638, Type IV / D6693				
Yield Strength, ppl (N/cm) - TD		every 4th	130	(228)	166 (290)
- M D		every 4th	130	(228)	164 (287)
Break Strength, ppl (N/cm) - TD		every 4th	90	(158)	190 (333)
- M D		every 4th	90	(158)	230 (403)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		18
- M D	(33 mm)	every 4th	13		21
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		594
- M D	(51 mm)	every 4th	150		624
Tear Resistance, lb. (N)	ASTM D 1004				
- TD		every 4th	42	(187)	57 (252)
- M D		every 4th	42	(187)	58 (260)
Puncture Resistance, lb. (N)	ASTM D 4833				
		every 4th	108	(478)	152 (676)
Density, g/cc	ASTM D 1505				
		every 4th	0.940		0.946
Carbon Black Content, %	ASTM D 1603*				
		every 4th	2.0		2.6
Carbon Black Dispersion	ASTM D 5596				
Views In Cat1 - Cat2		every 4th	9		10
Asperity Height	GRI GM 12				
Average (mils) - Side A		every 2nd	10		19

Order No. 30461
 Customer Name Z-Tech/Geogard
 Project Name Z-Tech/Geogard-Ref R127371961
 Location CPU- Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 103121553

ROLL IDENTIFICATION

Roll Number	103121553
Product Name	HDT060A000
Production Date	6/18/2003
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	3,985 pounds 1,808 kilograms

RESIN INFORMATION

Lot Number	8230488
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)	0.08

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 D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	166	(290)
- M D		every 4th	130	(228)	184	(287)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	190	(333)
- M D		every 4th	90	(158)	230	(403)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		18	
- M D	(33 mm)	every 4th	13		21	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		594	
- M D	(51 mm)	every 4th	150		624	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- M D		every 4th	42	(187)	58	(260)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	108	(478)	152	(676)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		19	

Order No. 30461
 Customer Name Z-Tech/Geogard
 Project Name Z-Tech/Geogard-Ref R127371981
 Location CPU- Quebec, Canada

*Modified

GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 103121555

ROLL IDENTIFICATION

Roll Number	103121555
Product Name	HDT060A000
Production Date	6/18/2003
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	4,000 pounds 1,814 kilograms

RESIN INFORMATION

Lot Number	8230486
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)	0.08

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 D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	161	(281)
- M D		every 4th	130	(228)	156	(272)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	197	(344)
- M D		every 4th	90	(158)	205	(359)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		17	
- M D	(33 mm)	every 4th	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		517	
- M D	(51 mm)	every 4th	150		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	60	(269)
- M D		every 4th	42	(187)	60	(269)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	108	(478)	153	(679)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views In Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No. 30461
 Customer Name Z-Tech/Geogard
 Project Name Z-Tech/Geogard-Ref R127371961
 Location CPU- Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03



05/29/2003 10:32 2812308630

GSE MTL5 MGMNT

2812275252 P.02

ATOFINA

TOFINA

~~ACEX 68317~~

GSE / Attn: Sue P.
fax#281-230-8630
PALESTINE TX

SHIPPED TO:
ATOFINA Petrochemical Inc.
c/o GSE Lining Technologies
UP Track 14732 Westfield
WESTFIELD TX 77090

Date

05/29/2003

Purchase order item/date

Delivery item/date

80996998 000001 / 05/19/2003

Order item

Customer number

8158

Material: Our / Your reference
FINACENE M 3302 * (441464) /

Please find below test data and pertinent information on ATOFINA HDPE material shipped to your plant.

Batch D30520896 Quantity 193,700 LB Railcar CEFX050247

Characteristic	Unit	Value
Melt Index 2-16/190	g/10 min	0.25
Density	g/cc	0.933
Railcar Prefix	-	CEFX
Railcar Number	-	050247

Sincerely,
Curt Clark
Bayport Laboratory Supervisor

ATOFINA
12212 Port Road
Pasadena, TX 77507

P. O. Box 5010
LaPorte, TX 77572

281-474-6965

Questions? Contact Customer Service at 1-800-344-3462



NOVA Chemicals Corporation
 Post Office Box 5006
 Red Deer, Alberta
 Canada T4N 6A1
 Telephone 1-403-314-8611
 FAX 1-403-314-8018

CERTIFICATE OF ANALYSIS

May 13, 2003

NOVA CHEMICALS, INC
 ZONE 14 TRACK 705
 ALDINE, TX, US

NOVA CHEMICALS CORPORATION certifies that the POLYETHYLENE product described herein, meets the requirements of NOVA's product specification (s) for such product.

Customer P.O. Number: 26606
 Product Weight(LB): 197808
 Nova Product Designation: TD-2154-E2 HOPPER CAR
 Nova Order Number: 254175
 Nova Batch Number: JP00044298
 Delivery Note Number/Item No: 400660095 / 10
 Container Number: NCIX6835
 Goods Issue Number: 4902314664
 Shipment Date: 13-May-03

THE FOLLOWING TEST RESULTS WERE OBTAINED:

<u>PROPERTY NAME</u>	<u>UNITS</u>	<u>RESULTS</u>
BULK DENSITY	LBS/FT3	34.6
COLOR	-	B-
DENSITY	G/CM3	0.9337
FILM APPEARANCE RATING	NUMBER	0
FLOW INDEX	G/10 MIN	17.29
MELT FLOW RATIO	-	29.3
MELT INDEX	G/10 MIN	0.59

ANNA SUTHERLAND
 QUALITY SYSTEMS ADMINISTRATOR

CONTACTS:

BRADFORD
 TRACY

1-281-230-5831

BOHAC
 DON

1-281-230-8630





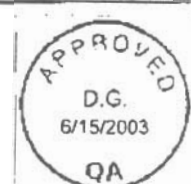
Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139826

ROLL IDENTIFICATION			RESIN INFORMATION			
Roll Number	115139826		Lot Number	JP00044298		
Product Name	HDE060A000		Type	TD-2154-E2		
Production Date	6/15/2003		Supplier	Nova		
Length $\approx (\pm 1\%)$	560 171	feet meters	GSE RESIN TEST DATA			
Width (Nominal)	22.5 6.9	feet meters	Property	Test Method	Results	
Sheet Area	12,600 1,170	sq. feet sq. meters	Density, g/cc	ASTM D 1505	0.934	
Weight	3,818 1,732	pounds kilograms	Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.59	
Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	59	(1.50)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 3rd	130	(228)	148	(259)
- MD		every 3rd	130	(228)	146	(256)
Break Strength, ppi (N/cm) - TD		every 3rd	243	(425)	340	(595)
- MD		every 3rd	243	(425)	335	(586)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd	13		18	
- MD	(33 mm)	every 3rd	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 3rd	700		899	
- MD	(51 mm)	every 3rd	700		885	
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	49	(217)
- MD		every 3rd	42	(187)	50	(222)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 3rd	119	(527)	147	(653)
Density, g/cc	ASTM D 1505					
		every 3rd	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*					
		every 3rd	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 3rd	9		10	

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371961
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139827

ROLL IDENTIFICATION

Roll Number	115139827
Product Name	HDE060A000
Production Date	6/15/2003
Length $\pm$ (1%)	560 feet 171 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	12,600 sq. feet 1 170 sq. meters
Weight	3,814 pounds 1,730 kilograms

RESIN INFORMATION

Lot Number	JP00044298
Type	TD-2154-E2
Supplier	Nova

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.934
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.59

Physical Property	Test Method	Test Frequency	Customer Minimum English	Metric	Test Results English	Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	59	(1.50)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 3rd	130	(228)	148	(259)
- MD		every 3rd	130	(228)	146	(256)
Break Strength, ppi (N/cm) - TD		every 3rd	243	(425)	340	(595)
- MD		every 3rd	243	(425)	335	(586)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd	13		18	
- MD	(33 mm)	every 3rd	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 3rd	700		899	
- MD	(51 mm)	every 3rd	700		665	
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	48	(217)
- MD		every 3rd	42	(187)	50	(222)
Puncture Resistance, lb. (N)	ASTM D 4833	every 3rd	119	(527)	147	(653)
Density, g/cc	ASTM D 1505	every 3rd	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*	every 3rd	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 3rd	9		10	
Views in Cat1 - Cat2						

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371961
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev - - 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139828

ROLL IDENTIFICATION

Roll Number	115139828
Product Name	HDE060A000
Production Date	6/15/2003
Length $\pm$ (± 1%)	560 feet 171 meters
Width (Nominal)	22.5 feet 6.9 meters
Sheet Area	12.600 sq. feet 1.170 sq. meters
Weight	3.618 pounds 1.732 kilograms

RESIN INFORMATION

Lot Number	JP00044298
Type	TD-2154-E2
Supplier	Nova

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1565	0.934
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.59

Physical Property	Test Method	Test Frequency	Customer Minimum English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	59	(1.49)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, psi (N/cm) - TD		every 3rd	130	(228)	150	(262)
- MD		every 3rd	130	(228)	149	(261)
Break Strength, psi (N/cm) - TD		every 3rd	243	(425)	358	(627)
- MD		every 3rd	243	(425)	373	(653)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd	13		19	
- MD	(33 mm)	every 3rd	13		19	
Break Elongation, % - TD	gauge length = 2.0"	every 3rd	700		958	
- MD	(51 mm)	every 3rd	700		983	
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	49	(219)
- MD		every 3rd	42	(187)	50	(222)
Puncture Resistance, lb. (N)	ASTM D 4833	every 3rd	119	(527)	148	(660)
Density, g/cc	ASTM D 1505	every 3rd	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*	every 3rd	2.0		2.9	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 3rd	9		10	

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371961
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada
 *Modified
 GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139829

ROLL IDENTIFICATION		
Roll Number	115139829	
Product Name	HDE060A000	
Production Date	6/15/2003	
Length $\approx$ (+/- 1%)	560 171	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	12,600 1,170	sq. feet sq. meters
Weight	3,820 1,733	pounds kilograms

RESIN INFORMATION		
Lot Number	JP00044298	
Type	TD-2154-E2	
Supplier	Nova	
GSE RESIN TEST DATA		
<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Density, g/cc	ASTM D 1505	0.934
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.59

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	58	(1.49)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 3rd	130	(228)	150	(262)
- MD		every 3rd	130	(228)	149	(261)
Break Strength, ppi (N/cm) - TD		every 3rd	243	(425)	358	(627)
- MD		every 3rd	243	(425)	373	(653)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd		13		19
- MD	(33 mm)	every 3rd		13		19
Break Elongation, % - TD	gauge length = 2.0"	every 3rd		700		958
- MD	(51 mm)	every 3rd		700		983
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	49	(219)
- MD		every 3rd	42	(187)	50	(222)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 3rd	119	(527)	148	(660)
Density, g/cc	ASTM D 1505					
		every 3rd		0.940		0.942
Carbon Black Content, %	ASTM D 1603*					
		every 3rd		2.0		2.9
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 3rd		9		10

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371981
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada

*Modified
 GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139831

ROLL IDENTIFICATION

Roll Number 115139831
 Product Name HDE060A000
 Production Date 6/15/2003

Length $\approx$ (+/- 1%) 560 feet
 171 meters
 Width (Nominal) 22.5 feet
 6.9 meters
 Sheet Area 12,600 sq. feet
 1,170 sq. meters
 Weight 3,822 pounds
 1,734 kilograms

RESIN INFORMATION

Lot Number D30520896
 Type M3302
 Supplier Atofina

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.933
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.25

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	58	(1.48)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 3rd	130	(228)	150	(262)
- MD		every 3rd	130	(228)	145	(254)
Break Strength, ppi (N/cm) - TD		every 3rd	243	(425)	360	(629)
- MD		every 3rd	243	(425)	361	(632)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd	13		19	
- MD	(33 mm)	every 3rd	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 3rd	700		969	
- MD	(51 mm)	every 3rd	700		952	
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	48	(215)
- MD		every 3rd	42	(187)	49	(218)
Puncture Resistance, lb. (N)	ASTM D 4833	every 3rd	119	(527)	145	(646)
Density, g/cc	ASTM D 1505	every 3rd	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*	every 3rd	2.0		2.6	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 3rd	9		10	

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371961
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada

*Modified

GSE-8.2.4-007 Rev -- 02/03





Lining Technology, Inc.

Roll Test Data Report

Roll No. 115139833

ROLL IDENTIFICATION			RESIN INFORMATION		
Roll Number	115139833		Lot Number	D30520896	
Product Name	HDE060A000		Type	M3302	
Production Date	6/15/2003		Supplier	Atofina	
Length	≈ (+/- 1%)	560 feet 171 meters	GSE RESIN TEST DATA		
Width (Nominal)		22.5 feet 6.9 meters	Property	Test Method	Results
Sheet Area		12,600 sq. feet 1,170 sq. meters	Density, g/cc	ASTM D 1505	0.933
Weight		3,802 pounds 1.725 kilograms	Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.25

Physical Property	Test Method	Test Frequency	Customer English	Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5199					
Average		every roll	60	(1.51)	61	(1.54)
Minimum		every roll	54	(1.36)	58	(1.48)
Tensile Properties:	ASTM D638, Type IV / D6693					
Yield Strength, pli (N/cm) - TD		every 3rd	130	(228)	150	(262)
- MD		every 3rd	130	(228)	145	(254)
Break Strength, pli (N/cm) - TD		every 3rd	243	(425)	360	(629)
- MD		every 3rd	243	(425)	361	(632)
Yield Elongation, % - TD	gauge length = 1.3"	every 3rd		13		19
- MD	(33 mm)	every 3rd		13		18
Break Elongation, % - TD	gauge length = 2.0"	every 3rd		700		969
- MD	(51 mm)	every 3rd		700		952
Tear Resistance, lb. (N)	ASTM D 1004*					
- TD		every 3rd	42	(187)	48	(215)
- MD		every 3rd	42	(187)	49	(218)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 3rd	119	(527)	145	(646)
Density, g/cc	ASTM D 1505					
		every 3rd		0.940		0.942
Carbon Black Content, %	ASTM D 1603*					
		every 3rd		2.0		2.6
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 3rd		9		10

Order No. 30461
 Customer Name Z-Tech/Geogard-REF R127371961
 Project Name Z-Tech/Geogard
 Location CPU-Quebec, Canada

*Modified
 GSE-8.2.4-007 Rev - 02/03

