

NM1 - ____ 19____

**Minor
Modification**

**Evaporation Pond
Installation QA/QC Report**

2008

RECEIVED

August 11, 2008

2008 AUG 18 PM 3 04

NMOCD Environmental
ATTN: Wayne Price
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Gandy Marley, Inc.
Minor Modification #NM-01-0019
As Built Information

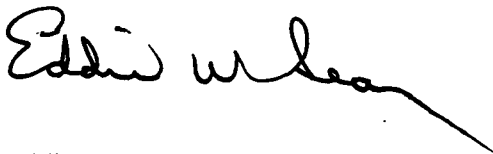
Mr. Price:

Find enclosed two copies of the drawing, diagrams and soil test pertaining to the approved evaporation pond listed above.

This information should have been sent earlier, but both Gandy-Marley and myself forgot, we apologize for the delay.

Should you have any questions, please call.

Sincerely,



Eddie W. Seay, Agent
Eddie Seay Consulting
601 W. Illinois
Hobbs, NM 88242
(575)392-2236
seay04@leaco.net

cc: Gandy Marley, Inc.

**GANDY MARLEY, INC.
EVAPORATION POND**

**MINOR MODIFICATION
#NM-01-0019**

**Gandy Marley, Inc.
P.O. Box 1658
Roswell, NM 88202**



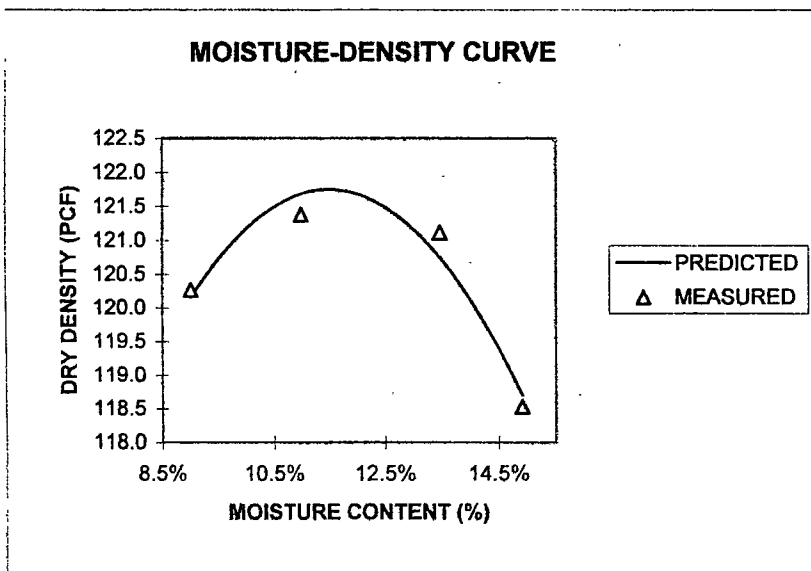
Smith Engineering Company
A Full-Service Engineering Company

SOIL REPORT FORM

PROJECT Evaporation Pond-Gandy Marley Landfill LAB NO. 306922
CLIENT Gandy Marley SAMPLE NO. J060466
CONTRACTOR _____ SAMPLED BY Client DATE 10/23/2006
A SAMPLE OF Natural Ground TESTED BY ISD DATE 10/25/2006
LOCATION Pond at Waste Site

AGGREGATE SIEVE ANALYSIS

TEST METHOD - ASTM D-698 A



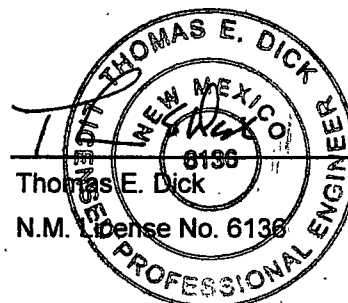
SIEVE SIZE (U.S.B.S.)	CUMULATIVE % PASSING	SPECIFICATION LIMITS
2"	NT	
1 1/2"	NT	
1"	NT	
3/4"	NT	
1/2"	NT	
3/8"	NT	
No. 4	NT	
No. 10	NT	
No. 40	NT	
No. 80	NT	
No. 200	NT	

% GRAVEL	NT
% SAND	NT
% SILT AND CLAY	NT

MAX. DRY DENSITY 122.0 OPTIMUM MOISTURE 11.5%
CORRECTED FOR OVERSIZE FRACTION: (ASTM D4718)
MODIFIED M.D. NT MODIFIED O.M. NT

ATTERBERG LIMITS (ASTM D4318)
LIQUID LIMIT NT PLASTICITY INDEX NT

COPIES TO:



Thomas E. Dick
N.M. License No. 6136

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Evaporation Pond - Gandy Marley Landfill*

LAB NO: 306922

CLIENT: *Gandy Marley*

TESTED BY: *SAY*

CONTRACTOR: *AG Services*

DATE TESTED: 12/14/06

MATERIAL: *Natural Ground (Red Clay)*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
1	SE. corner - bottom, 1st lift	8.4	126.4	104%	95%
2	NE. corner - bottom, 1st lift	9.5	125.7	103%	95%
3	NW. corner - bottom, 1st lift	7.8	125.3	103%	95%
4	SW. corner - bottom, 1st lift	8.5	116.9	96%	95%
5	W. slope, N. end, 1st lift	10.6	115.6	95%	95%
6	W. slope, S. end, 1st lift	11.4	117.2	96%	95%
7	S. slope, W. end, 1st lift	11.7	126.0	103%	95%
8	S. slope, E. end, 1st lift	12.7	122.0	100%	95%
9	E. slope, middle, 1st lift	10.9	117.5	96%	95%
10	N. slope, E. end, 1st lift	9.3	121.5	100%	95%
11	N. slope, W. end, 1st lift	11.9	117.1	96%	95%

REMARKS:

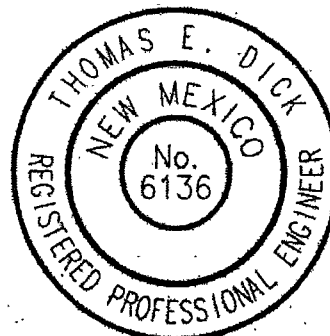
TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 122.0

COPIES TO:

Gandy Marley
AG Services



Thomas E. Dick
Thomas E. Dick, P.E.
N.M. LICENSE NO. 6136

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Evaporation Pond - Gandy Marley Landfill*

LAB NO: 306922

CLIENT: *Gandy Marley*

TESTED BY: *AP*

CONTRACTOR: *AG Services*

DATE TESTED: 12/28/06

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
12	100' E. of SW. corner & 12' from top; final lift	11.6	124.6	102%	95%
13	30' W. of SE. corner & 12' from top; final lift	11.2	127.8	105%	95%
14	100' N. of SE. corner & 6' from top; final lift	11.7	126.4	104%	95%
15	35' S. of NE. corner & 8' from bottom; final lift	10.6	124.2	102%	95%
16	200' E. of NW. corner & 5' from bottom; final lift	9.8	121.0	99%	95%
17	50' S. of NW. corner & 20' from top; final lift	10.3	126.0	103%	95%
18	100' N. of SW. corner & 25' from top; final lift	10.1	116.5	95%	95%
19	35' S. of North end & 50' E. from West end; final lift	10.7	123.3	101%	95%
20	200' S. of North end & 125' W. from East end, final lift	9.8	118.6	97%	95%

REMARKS:

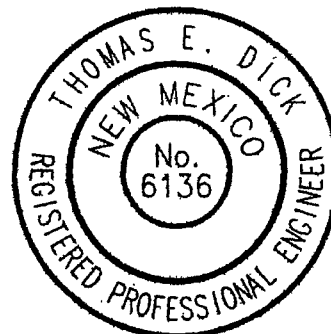
TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 122.0

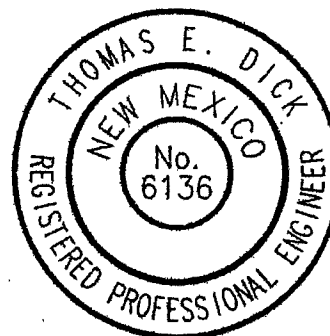
COPIES TO:

Gandy Marley
AG Services



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N.M. LICENSE NO. 6136

(505)622-8866



TH *E*
Thomas E. Dick, P.E.
N.M. LICENSE NO. 6136



Smith Engineering Company
A Full-Service Engineering Company

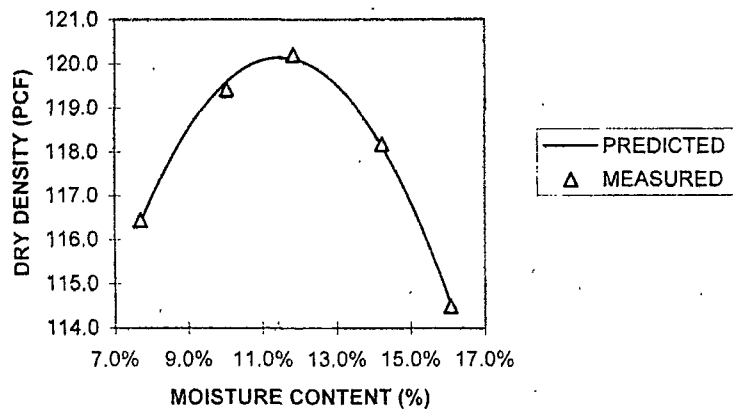
SOIL REPORT FORM

PROJECT Gandy Marley Landfill Extension LAB NO. 307905
CLIENT Gandy Marley SAMPLE NO. J070301
CONTRACTOR AG Services SAMPLED BY Client DATE 12/31/2008
A SAMPLE OF NG TESTED BY ISD/MDT DATE 12/3/2008
LOCATION On Site

AGGREGATE SIEVE ANALYSIS

TEST METHOD - ASTM D-698 A

MOISTURE-DENSITY CURVE



ASTM C136

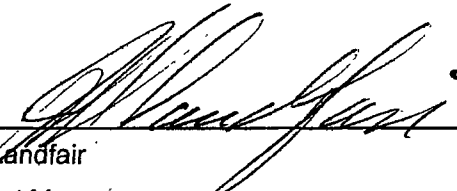
SIEVE SIZE (U.S.B.S.)	CUMULATIVE % PASSING	SPECIFICATION LIMITS
2"	NT	
1 1/2"	NT	
1"	NT	
3/4"	NT	
1/2"	NT	
3/8"	NT	
No. 4	NT	
No. 10	NT	
No. 40	NT	
No. 80	NT	
No. 200	NT	

% GRAVEL	NT
% SAND	NT
% SILT AND CLAY	NT

MAX. DRY DENSITY 120.0 OPTIMUM MOISTURE 11.5%
CORRECTED FOR OVERSIZE FRACTION: (ASTM D4718)
MODIFIED M.D. NT MODIFIED O.M. NT

ATTERBERG LIMITS (ASTM D4318)

LIQUID LIMIT NT PLASTICITY INDEX NT


Jim Landfair
Project Manager

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Gandy Marley Landfill Extention*

LAB NO: 307905

CLIENT: *Gandy Marley*

TESTED BY: MDT

CONTRACTOR: *Gandy Marley*

DATE TESTED: 01/15/08

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
1	South Bank (top of Embankment)	12.4	124.9	104%	95%
2	South Bank (top of Embankment)	12.4	124.3	104%	95%
3	South Bank (top of Embankment)	11.0	126.5	105%	95%
4	South Bank (bottom of Embankment)	12.0	124.7	104%	95%
5	South Bank (bottom of Embankment)	14.1	114.2	95%	95%
6	South Bank (bottom of Embankment)	12.2	124.7	104%	95%
7	Pit Area Southeast	10.7	125.6	105%	95%
8	Pit Area Southend Middle	14.2	122.0	102%	95%
9	Pit Area Southwest	12.5	122.0	102%	95%

REMARKS:

TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 120.0

COPIES TO:

Gandy Marley


Jim Landfair, Project Manager

(505)622-8866

Jim Landfair, Project Manager

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Gandy Marley Landfill Extension*

LAB NO: 307905

CLIENT: *Gandy Marley*

TESTED BY: MDT

CONTRACTOR: *AG Services*

DATE TESTED: 01/18/08

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
13	Pit area (1st lift) Northeast end of pit	11.4	125.8	105%	95%
14	Pit area North middle	10.4	120.5	100%	95%
15	Pit area North end on NW. corner	11.3	114.3	95%	95%
16	2nd lift South end, pit area SE. corner	13.1	119.2	99%	95%
17	2nd lift Southend on middle	9.5	122.7	102%	95%
18	2nd lift South end on SW. corner	11.3	127.1	106%	95%
19	Slope (2nd lift) bottom NW. end	11.0	124.9	104%	95%
20	Slope (2nd lift) Middle	10.6	125.7	105%	95%
21	Slope (2nd lift) NE. end	14.5	124.9	104%	95%
22	Slope (2nd lift) top NE. corner	12.3	115.1	96%	95%
23	Slope (2nd lift) Middle	13.3	122.4	102%	95%
24	Slope (2nd lift) NW. corner	10.4	124.0	103%	95%

REMARKS:

TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 120.0

COPIES TO:

Gandy Marley


Jim Landfair, Project Manager

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Gandy Marley Landfill Extension*

LAB NO: 307905

CLIENT: *Gandy Marley*

TESTED BY: MDT

CONTRACTOR: *AG Services*

DATE TESTED: 01/22/08

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
25	2nd lift pit area middle section E. end	8.1	121.0	101%	95%
26	2nd lift pit area middle section middle	10.2	117.9	98%	95%
27	2nd lift pit area middle section W. end	8.0	119.8	100%	95%
8	2nd lift pit area North end on NW. corner	10.0	123.3	103%	95%
29	2nd lift pit area North end middle of area	10.2	119.8	100%	95%
30	2nd lift pit area North end on SE. corner	10.9	116.1	97%	95%

REMARKS:

TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 120.0

COPIES TO:

Gandy Marley


Jim Landfair, Project Manager

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Gandy Marley Landfill Extension*

LAB NO: 307905

CLIENT: *Gandy Marley*

TESTED BY: MDT

CONTRACTOR: *AG Services*

DATE TESTED: 01/28/08

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
31	N. slope 1st lift bottom of slope	12.3	120.5	100%	95%
32	N. slope 1st lift top of slope	12.8	117.7	98%	95%
33	N. slope 1st lift top of slope	11.9	125.1	104%	95%
34	N. slope 1st lift top of slope	12.0	120.2	100%	95%
35	N. slope 1st lift bottom of slope	11.9	121.7	101%	95%
36	N. slope 1st lift bottom of slope	12.8	126.8	106%	95%

REMARKS:

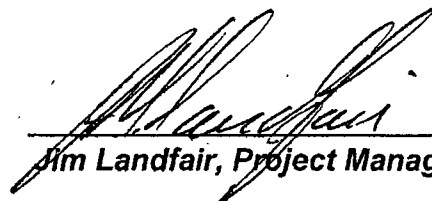
TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 120.0

COPIES TO:

Gandy Marley


Jim Landfair, Project Manager

REPORT OF MOISTURE FIELD DENSITY TESTS



Smith Engineering Company
A Full-Service Engineering Company

(505)622-8866

PROJECT: *Gandy Marley Landfill Extension*

LAB NO: 307905

CLIENT: *Gandy Marley*

TESTED BY: MDT

CONTRACTOR: *AG Services*

DATE TESTED: 01/28/08

MATERIAL: *Natural Ground*

TEST NO.	LOCATION OF TEST	PERCENT MOISTURE	DRY DENSITY LBS/CU FT	PERCENT PROCTOR	REQUIRED COMPACTION
37	N. slope 2nd lift bottom of slope on W. end	13.5	118.1	98%	95%
38	N. slope 2nd lift top of slope on W. end	11.5	119.5	100%	95%
39	N. slope 2nd lift top of slope middle section	13.3	120.6	101%	95%
40	N. slope 2nd lift top of slope E. end	14.0	114.2	95%	95%
41	N. slope 2nd lift bottom of slope on E. end	15.0	115.5	96%	95%
42	N. slope 2nd lift bottom of slope middle section	13.2	118.3	99%	95%

REMARKS:

TEST METHOD: *ASTM-D-2922, bs*

OPTIMUM MOISTURE: 11.5

OPTIMUM DENSITY: 120.0

COPIES TO:

Gandy Marley


Jim Landfair, Project Manager

N

[illegible]

Roll Serial #5 60 Mil Randy Marley

#1	244649-06	420'-340' (80')-50' (30')	157'
#2	651-06	420'-342' (78')-65' (13')	2m'
#3	645-06	420'-340' (80')-44' (36')	3m'
#4	641-06	420'-342' (78')-49'-30' (0')	4m'
#5	635-06	420'-340'-68' (80') (12')	5m'
#6	755-06	420-57'-36'-65'-65'-62'-62'-60' (13')	
#7	643-06	420-64'-60'-58'-58'-58' (122) 59-38 (25')	
#8	753-06	420-63'-63'-64'-65'-66'-99'-67' (31') (0')	
#9	648-06	420-68' (352') = Long Run 340' (12')	
#10	760-06	420-69' (351')-340' (11')	
#11	762-06	420-6'-70' (344')-340' (4')	
#12	761-06	420-70' (350')-340' (12')	
#13	647-06	420-71' (349')-340' (9')	
#14	642-06	420-48'-31' (341')-340' (0')	
#15	636-06	420-73' (347')-347' (0')	
#16	640-06	420-50'-27' (343')-340' (0')	
#17	754-06	420-51'-26' (343')-340' (0')	

Over

#18	244756-06	420-54-34-50-42 = 240'-50'-50'-50'-50'
#19	244763-06	420-48-48-48-48-45-48-45- 73-24 66-42-18' (18')
#20	638-06	420-62-42-67-67-68-68-18' (18')
#21	652-06	420-65-64-63-62-61-58 (47')
#22	650-06	(Not used)
#23	644-06	420-340 (80' - 80 = 0')
#24	646-06	420-340 (80' - 67 = 13')
#25	759-06	420-340 (80' - 57 = 23')
#26	639-06	420-340 (80')
#27	637-06	420-340 (80' - 69 = 11')



quality certificate

ROLL # **244636-06** Lot # **MM196106** Liner Type: **SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)	Metric	English	Thickness	1.5mm	60mil	
MIN:	1.506 mm	59 mil	Length	128	m	420 feet
MAX:	1.666 mm	66 mil	Width	6.86	m	22.5 feet
AVE:	1.567 mm	62 mil	OIT(Standard) ASTM D3895 minutes 157			

Specific Gravity ASTM D792 Density g/cc .947

MFI ASTM D1238

COND. E GRADE: 7002 Melt Flow Index 190°C /2160 g - g /10 min .26

Carbon Black Content ASTM D4218 Range % 2.28

Carbon Black Dispersion ASTM D5596 Category 1

Tensile Strength

ASTM D6693 Average Strength @ Yield 26 N/mm 148 ppi 2,466 psi

ASTM D638 (Modified) (2 inches / minute)

Average Strength @ Break 46 N/mm 263 ppi 4,383 psi

Elongation ASTM D-6693

ASTM D638 (Modified) Average Elongation @ Yield % 16.99

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break Average Elongation @ Break % 856.3

Dimensional Stability

ASTM D1204 (Modified) Average Dimensional Change % 0.07

Tear Resistance

ASTM D1004 (Modified) Average Tear Resistance 235 N 52.726 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified) Load 492 N 110.59 lbs

Puncture Resistance

ASTM D4833 (Modified) Load 582 N 130.73 lbs

ESCR

ASTM D1693 Minimum Hrs w / o Failures 1500 hrs CERTIFIED

Notched Constant Tensile Load

ASTM D5397 pass / fail @ 30% 300 hrs ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244635-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	METRIC	ENGLISH	Thickness	1.5mm	60mil	Length	128	m	420	feet
ASTM D5199 (Modified)	MIN: 1.452 mm	57 mil	Width	6.86	m	22.5	feet			
	MAX: 1.668 mm	66 mil								
	AVE: 1.552 mm	61 mil	OIT(Standard) ASTM D3895	minutes	157					

Specific Gravity ASTM D792	Density	g/cc	.947
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MFI ASTM D1238			
COND. E	Melt Flow Index 190°C /2160 g - g /10 min		.26
GRADE: 7002			

Carbon Black Content ASTM D4218	Range	%	2.28
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Carbon Black Dispersion ASTM D5596	Category	1
------------------------------------	----------	---

Tensile Strength ASTM D6693	Average Strength @ Yield	26 N/mm	148 ppi	2,466 psi
ASTM D638 (Modified)				
(2 inches / minute)				

Average Strength @ Break	46 N/mm	263 ppi	4,383 psi
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Elongation ASTM D-6693			
ASTM D638 (Modified)	Average Elongation @ Yield	%	16.99
(2 inches / minute)			
Lo = 1.3" Yield			
Lo = 2.0" Break	Average Elongation @ Break	%	856.3

Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	235 N	52.726 lbs
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Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	492 N	110.59 lbs
---	------	-------	------------

Puncture Resistance ASTM D4833 (Modified)	Load	582 N	130.73 lbs
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ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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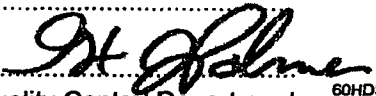
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: 
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244637-06**

Lot #

MM196106

Liner Type: **SMOOTH HDPE**

Thickness Measurement	MIN:	METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MAX:	1.405 mm	55 mil	Length	128	m	420	feet
	AVE:	1.599 mm	63 mil	Width	6.86	m	22.5	feet
		1.522 mm	60 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002	Melt Flow Index 190°C /2160 g - g /10 min	.26
------	---	-----

Carbon Black Content

ASTM D4218

Range	%	2.28
-------	---	------

Carbon Black Dispersion

ASTM D5596

Category	1
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Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield	26 N/mm	148 ppi	2,466 psi
--------------------------	---------	---------	-----------

Average Strength @ Break	46 N/mm	263 ppi	4,383 psi
--------------------------	---------	---------	-----------

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield	%	16.99
----------------------------	---	-------

Average Elongation @ Break	%	856.3
----------------------------	---	-------

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change	%	0.07
----------------------------	---	------

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance	235 N	52.726 lbs
-------------------------	-------	------------

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load	492 N	110.59 lbs
------	-------	------------

Puncture Resistance

ASTM D4833 (Modified)

Load	582 N	130.73 lbs
------	-------	------------

ESCR

ASTM D1693

Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
----------------------------	----------	-----------

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%	300 hrs	ONGOING
-------------------	---------	---------

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244638-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.497 mm	59 mil	Length	128	m	420 feet
	MAX:	1.683 mm	66 mil	Width	6.86	m	22.5 feet
	AVE:	1.553 mm	61 mil	OIT(Standard)	ASTM D3895	minutes	157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002

Melt Flow Index 190°C /2160 g - g /10 min

.26

Carbon Black Content
ASTM D4218

Range

%

2.28

Carbon Black Dispersion
ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)
(2 inches / minute)

Average Strength @ Yield

26 N/mm

148 ppi

2,466 psi

Average Strength @ Break

46 N/mm

263 ppi

4,383 psi

Elongation ASTM D-6693

ASTM D638 (Modified)
(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield

%

16.99

Average Elongation @ Break

%

856.3

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

0.07

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

235 N

52.726 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

492 N

110.59 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

582 N

130.73 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244639-06** Lot # **MM196106** Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.452 mm	57 mil	Length	128	m	420 feet
	MAX:	1.688 mm	66 mil	Width	6.86	m	22.5 feet
	AVE:	1.567 mm	62 mil	OIT (Standard) ASTM D3895	minutes		157

Specific Gravity
ASTM D792 Density g/cc .947

MFI ASTM D1238
COND. E
GRADE: 7002 Melt Flow Index 190°C / 2160 g - g / 10 min .26

Carbon Black Content
ASTM D4218 Range % 2.25

Carbon Black Dispersion
ASTM D5596 Category 1

Tensile Strength
ASTM D6693
ASTM D638 (Modified)
(2 inches / minute)

Average Strength @ Yield	25 N/mm	144 ppi	2,405 psi
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Average Strength @ Break	46 N/mm	265 ppi	4,413 psi
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Elongation ASTM D-6693
ASTM D638 (Modified)
(2 inches / minute)
Lo = 1.3" Yield
Lo = 2.0" Break

Average Elongation @ Yield	%	17.01
Average Elongation @ Break	%	857.5

Dimensional Stability
ASTM D1204 (Modified)

Average Dimensional Change	%	0.07
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Tear Resistance
ASTM D1004 (Modified)

Average Tear Resistance	235 N	52.726 lbs
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Puncture Resistance
FTMS 101 Method 2065 (Modified)

Load	492 N	110.59 lbs
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Puncture Resistance
ASTM D4833 (Modified)

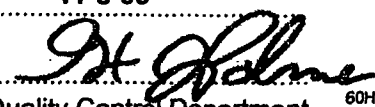
Load	582 N	130.73 lbs
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ESCR
ASTM D1693 Minimum Hrs w / o Failures 1500 hrs CERTIFIED

Notched Constant Tensile Load
ASTM D5397 pass / fail @ 30% 300 hrs ONGOING

Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: 
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244640-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	MIN:	METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MAX:	1.429 mm	56 mil	Length	128	m	420 feet
	AVE:	1.664 mm	66 mil	Width	6.86	m	22.5 feet
				QIT(Standard)	ASTM D3895	minutes	157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.26
GRADE:	7002	

Carbon Black Content	Range	%	2.25
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength

ASTM D6693	Average Strength @ Yield	25 N/mm	144 ppi	2,405 psi
ASTM D638 (Modified)				
(2 inches / minute)				

Average Strength @ Break	46 N/mm	265 ppi	4,413 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)	Average Elongation @ Yield	%	17.01
(2 inches / minute)			

Lo = 1.3" Yield

Lo = 2.0" Break	Average Elongation @ Break	%	857.5
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Dimensional Stability

ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)	Average Tear Resistance	235 N	52.726 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)	Load	492 N	110.59 lbs
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Puncture Resistance

ASTM D4833 (Modified)	Load	582 N	130.73 lbs
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ESCR

ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244641-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MIN:	1.495 mm	59 mil	Length	128	m	420	feet
	MAX:	1.704 mm	67 mil	Width	6.86	m	22.5	feet
	AVE:	1.567 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002	Melt Flow Index 190°C /2160 g - g /10 min	.26
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Carbon Black Content

ASTM D4218

Range	%	2.25
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Carbon Black Dispersion

ASTM D5596

Category	1
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Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield	25 N/mm	144 ppi	2,405 psi
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Average Strength @ Break	46 N/mm	265 ppi	4,413 psi
--------------------------	---------	---------	-----------

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield	%	17.01
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Average Elongation @ Break	%	857.5
----------------------------	---	-------

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance	235 N	52.726 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load	492 N	110.59 lbs
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Puncture Resistance

ASTM D4833 (Modified)

Load	582 N	130.73 lbs
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ESCR

ASTM D1693

Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244643-06**

Lot #

MM196106

Liner Type: **SMOOTH HDPE**

		METRIC	ENGLISH	Thickness	1.5mm	60mil	
Thickness				Length	128	m	420 feet
Measurement	MIN:	1.513 mm	60 mil	Width	6.86	m	22.5 feet
ASTM D5199	MAX:	1.739 mm	68 mil				
(Modified)	AVE:	1.597 mm	63 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

Melt Flow Index 190°C /2160 g - g /10 min

.26

GRADE:

7002

Carbon Black Content

Range

%

2.25

ASTM D4218

Carbon Black Dispersion

Category

1

ASTM D5596

Tensile Strength

ASTM D6693

Average Strength @ Yield

25 N/mm

144 ppi

2,405 psi

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Break

46 N/mm

265 ppi

4,413 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

Average Elongation @ Yield

%

17.01

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Break

%

857.5

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

0.07

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

235 N

52.726 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

492 N

110.59 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

582 N

130.73 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

[Signature]
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244644-06** Lot # **MM196106** Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.544 mm	61 mil	Length	128	m	420 feet
	MAX:	1.723 mm	68 mil	Width	6.86	m	22.5 feet
	AVE:	1.603 mm	63 mil	OIT(Standard)	ASTM D3895	minutes	157

Specific Gravity
ASTM D792

Density g/cc .947

MFI ASTM D1238
COND. E
GRADE: 7002

Melt Flow Index 190°C /2160 g - g /10 min .26

Carbon Black Content
ASTM D4218

Range % 2.43

Carbon Black Dispersion
ASTM D5596

Category 1

Tensile Strength
ASTM D6693
ASTM D638 (Modified)
(2 inches / minute)

Average Strength @ Yield 24 N/mm 140 ppi 2,330 psi

Average Strength @ Break 47 N/mm 266 ppi 4,429 psi

Elongation ASTM D-6693
ASTM D638 (Modified)
(2 inches / minute)
Lo = 1.3" Yield
Lo = 2.0" Break

Average Elongation @ Yield % 17.71

Average Elongation @ Break % 885.2

Dimensional Stability
ASTM D1204 (Modified)

Average Dimensional Change % 0.07

Tear Resistance
ASTM D1004 (Modified)

Average Tear Resistance 221 N 49.599 lbs

Puncture Resistance
FTMS 101 Method 2065 (Modified)

Load 461 N 103.67 lbs

Puncture Resistance
ASTM D4833 (Modified)

Load 561 N 126.15 lbs

ESCR
ASTM D1693

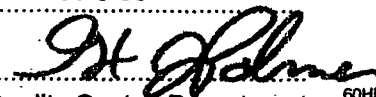
Minimum Hrs w / o Failures 1500 hrs CERTIFIED

Notched Constant Tensile Load
ASTM D5397

pass / fail @ 30% 300 hrs ONGOING

Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: 11-6-06

Signature: 
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244645-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MIN:	1.512 mm	60 mil	Length	128	m	420	feet
	MAX:	1.716 mm	68 mil	Width	6.86	m	22.5	feet
	AVE:	1.584 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002	Melt Flow Index 190°C /2160 g - g /10 min	.26
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Carbon Black Content

ASTM D4218

Range	%	2.43
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Carbon Black Dispersion

ASTM D5596

Category	1
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Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield	24 N/mm	140 ppi	2,330 psi
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Average Strength @ Break	47 N/mm	266 ppi	4,429 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield	%	17.71
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Average Elongation @ Break	%	885.2
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Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load	461 N	103.67 lbs
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Puncture Resistance

ASTM D4833 (Modified)

Load	561 N	126.15 lbs
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ESCR

ASTM D1693

Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397

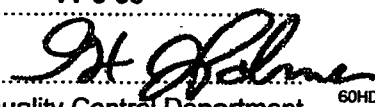
pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: 

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244651-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	MIN:	METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MAX:	1.491 mm	59 mil	Length	128	m	420	feet
	AVE:	1.713 mm	67 mil	Width	6.86	m	22.5	feet
		1.567 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity ASTM D792	Density	g/cc	.947
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MFI ASTM D1238			
COND. E	Melt Flow Index 190°C /2160 g - g /10 min		.26
GRADE:	7002		

Carbon Black Content ASTM D4218	Range	%	2.45
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Carbon Black Dispersion ASTM D5596	Category		1
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Tensile Strength ASTM D6693	Average Strength @ Yield	27 N/mm	152 ppi	2,535 psi
ASTM D638 (Modified) (2 inches / minute)				

Average Strength @ Break	47 N/mm	271 ppi	4,515 psi
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Elongation ASTM D-6693			
ASTM D638 (Modified) (2 inches / minute)	Average Elongation @ Yield	%	17.11
Lo = 1.3" Yield			
Lo = 2.0" Break	Average Elongation @ Break	%	881.3

Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
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Puncture Resistance ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244646-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.53 mm	60 mil	Length	128	m	420 feet
	MAX:	1.733 mm	68 mil	Width	6.86	m	22.5 feet
	AVE:	1.581 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.26
GRADE:	7002	

Carbon Black Content	Range	%	2.43
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength			
ASTM D6693	Average Strength @ Yield	24 N/mm	140 ppi
ASTM D638 (Modified)			2,330 psi
(2 inches / minute)			

Average Strength @ Break	47 N/mm	266 ppi	4,429 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)	Average Elongation @ Yield	%	17.71
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(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break	Average Elongation @ Break	%	885.2
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Dimensional Stability

ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)	Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
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Puncture Resistance

ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR

ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244649-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness		METRIC	ENGLISH	Thickness	1.5mm	60mil	
Measurement	MIN:	1.455 mm	57 mil	Length	128	m	420 feet
ASTM D5199	MAX:	1.679 mm	66 mil	Width	6.86	m	22.5 feet
(Modified)	AVE:	1.569 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.26
GRADE:	7002	

Carbon Black Content	Range	%	2.45
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength

ASTM D6693	Average Strength @ Yield	27 N/mm	152 ppi	2,535 psi
ASTM D638 (Modified)				
(2 inches / minute)				

Average Strength @ Break	47 N/mm	271 ppi	4,515 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)	Average Elongation @ Yield	%	17.11
(2 inches / minute)			

Lo = 1.3" Yield

Lo = 2.0" Break	Average Elongation @ Break	%	881.3
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Dimensional Stability

ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)	Average Tear Resistance	221 N	49,599 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
---------------------------------	------	-------	------------

Puncture Resistance

ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR

ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244650-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.482 mm	58 mil	Length	128	m	420 feet
	MAX:	1.794 mm	71 mil	Width	6.86	m	22.5 feet
	AVE:	1.587 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.26
GRADE:	7002	

Carbon Black Content	Range	%	2.45
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength

ASTM D6693	Average Strength @ Yield	27 N/mm	152 ppi	2,535 psi
ASTM D638 (Modified)				
(2 inches / minute)				

Average Strength @ Break	47 N/mm	271 ppi	4,515 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)	Average Elongation @ Yield	%	17.11
(2 inches / minute)			

Lo = 1.3" Yield

Lo = 2.0" Break	Average Elongation @ Break	%	881.3
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Dimensional Stability

ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance

ASTM D1004 (Modified)	Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
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Puncture Resistance

ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR

ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244652-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MIN:	1.45 mm	57 mil	Length	128	m	420	feet
	MAX:	1.673 mm	66 mil	Width	6.86	m	22.5	feet
	AVE:	1.557 mm	61 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity ASTM D792	Density	g/cc	.947
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MFI ASTM D1238 COND. E GRADE:	7002	Melt Flow Index 190°C /2160 g - g /10 min	.26
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Carbon Black Content ASTM D4218	Range	%	2.45
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Carbon Black Dispersion ASTM D5596	Category	1
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Tensile Strength ASTM D6693	Average Strength @ Yield	27 N/mm	152 ppi	2,535 psi
ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	47 N/mm	271 ppi	4,515 psi

Elongation ASTM D-6693	Average Elongation @ Yield	%	17.11
ASTM D638 (Modified) (2 inches / minute)	Average Elongation @ Break	%	881.3
Lo = 1.3" Yield			
Lo = 2.0" Break			

Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
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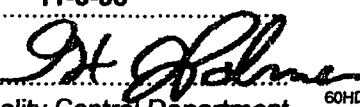
Puncture Resistance ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: 
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244753-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	Metric	English	Thickness	1.5mm	60mil			
MIN:	1.408 mm	55 mil	Length	128	m	420	feet	
MAX:	1.783 mm	70 mil	Width	6.86	m	22.5	feet	
ASTM D5199 (Modified)	AVE:	1.571 mm	62 mil	OIT(Standard) ASTM D3895 minutes				157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002

Melt Flow Index 190°C /2160 g - g /10 min

.26

Carbon Black Content

ASTM D4218

Range

%

2.45

Carbon Black Dispersion

ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield

27 N/mm

152 ppi

2,535 psi

Average Strength @ Break

47 N/mm

271 ppi

4,515 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Average Elongation @ Yield

%

17.11

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Break

%

881.3

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

0.07

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

221 N

49.599 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

461 N

103.67 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

561 N

126.15 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: 

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244754-06**

Lot #

MM196106

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.471 mm	58 mil	Length	128	m	420 feet
	MAX:	1.699 mm	67 mil	Width	6.86	m	22.5 feet
	AVE:	1.566 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity
ASTM D792

Density

g/cc

.947

MFI ASTM D1238

COND. E

GRADE:

7002

Melt Flow Index 190°C /2160 g - g /10 min

.26

Carbon Black Content

ASTM D4218

Range

%

2.42

Carbon Black Dispersion

ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield

26 N/mm

148 ppi

2,462 psi

Average Strength @ Break

47 N/mm

267 ppi

4,449 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield

%

17.05

Average Elongation @ Break

%

879.3

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

0.07

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

225 N

50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

422 N

94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

578 N

129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

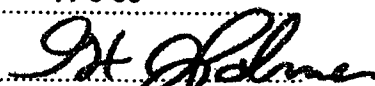
ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: 

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244755-06**

Lot #

MM196106

Liner Type: **SMOOTH HDPE**

Thickness Measurement	MIN:	METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MAX:	1.472 mm	58 mil	Length	128	m	420	feet
	AVE:	1.744 mm	69 mil	Width	6.86	m	22.5	feet
		1.571 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002

Melt Flow Index 190°C /2160 g - g /10 min

.26

Carbon Black Content
ASTM D4218

Range

%

2.42

Carbon Black Dispersion
ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)
(2 inches / minute)

Average Strength @ Yield

26 N/mm

148 ppi

2,462 psi

Average Strength @ Break

47 N/mm

267 ppi

4,449 psi

Elongation ASTM D-6693

ASTM D638 (Modified)
(2 inches / minute)

Average Elongation @ Yield

%

17.05

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Break

%

879.3

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

0.07

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

225 N

50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

422 N

94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

578 N

129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

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REV 06
12/23/05



quality certificate

ROLL # **244756-06**

Lot # **MM196103**

Liner Type: **SMOOTH HDPE**

		METRIC	ENGLISH	Thickness	1.5mm	60mil		
Thickness				Length	128	m	420	feet
Measurement	MIN:	1.508 mm	59 mil	Width	6.86	m	22.5	feet
ASTM D5199	MAX:	1.714 mm	67 mil					
(Modified)	AVE:	1.576 mm	62 mil	OIT(Standard) ASTM D3895	minutes		151	

Specific Gravity	Density	g/cc	.948
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002

Melt Flow Index 190°C /2160 g - g /10 min

.25

Carbon Black Content

ASTM D4218

Range

%

2.42

Carbon Black Dispersion

ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield

26 N/mm

148 ppi

2,462 psi

Average Strength @ Break

47 N/mm

267 ppi

4,449 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield

%

17.05

Average Elongation @ Break

%

879.3

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

-0.14

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

225 N

50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

422 N

94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

578 N

129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

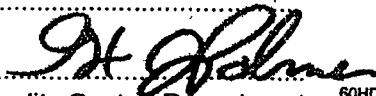
ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: 

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244759-06**

Lot # **MM196103**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	METRIC	ENGLISH	Thickness	1.5mm	60mil			
ASTM D5199 (Modified)	MIN: 1.49 mm	59 mil	Length	128	m	420	feet	
	MAX: 1.729 mm	68 mil	Width	6.86	m	22.5	feet	
	AVE: 1.581 mm	62 mil	OIT(Standard) ASTM D3895 minutes					151

Specific Gravity	Density	g/cc	.946
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.25
GRADE: 7002		

Carbon Black Content	Range	%	2.29
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength

ASTM D6693	Average Strength @ Yield	24 N/mm	134 ppi	2,241 psi
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ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Break	48 N/mm	274 ppi	4,568 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield	%	17.85
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Average Elongation @ Break	%	862.5
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Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change	%	-0.14
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Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance	225 N	50.567 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load	422 N	94.877 lbs
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Puncture Resistance

ASTM D4833 (Modified)

Load	578 N	129.96 lbs
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ESCR

ASTM D1693

Minimum Hrs w / o Failures	1500 hrs
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CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%	300 hrs
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ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244760-06**

Lot #

MM196103

Liner Type: **SMOOTH HDPE**

Thickness Measurement	METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MIN: 1.419 mm	56 mil	Length	128	m	420	feet
	MAX: 1.665 mm	66 mil	Width	6.86	m	22.5	feet
	AVE: 1.562 mm	61 mil	OIT(Standard) ASTM D3895	minutes		151	

Specific Gravity ASTM D792	Density	g/cc	.946
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MFI ASTM D1238

COND. E

GRADE:

Melt Flow Index 190°C /2160 g - g /10 min .25
7002

Carbon Black Content

ASTM D4218

Range

%

2.29

Carbon Black Dispersion

ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield

24 N/mm

134 ppi

2,241 psi

Average Strength @ Break

48 N/mm

274 ppi

4,568 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield

%

17.85

Average Elongation @ Break

%

862.5

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

-0.14

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

225 N

50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

422 N

94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

578 N

129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

60HDSM.FRM
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12/23/05



quality certificate

ROLL # **244761-06**

Lot # **MM196103**

Liner Type: **SMOOTH HDPE**

Thickness Measurement	MIN:	METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MAX:	1.498 mm	59 mil	Length	128	m	420	feet
	AVE:	1.671 mm	66 mil	Width	6.86	m	22.5	feet
		1.571 mm	62 mil	OIT(Standard) ASTM D3895	minutes		151	

Specific Gravity	Density	g/cc	.946
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

Melt Flow Index 190°C /2160 g - g /10 min

7002

.25

Carbon Black Content

ASTM D4218

Range

%

2.29

Carbon Black Dispersion

ASTM D5596

Category

1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield

24 N/mm

134 ppi

2,241 psi

Average Strength @ Break

48 N/mm

274 ppi

4,568 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield

%

17.85

Average Elongation @ Break

%

862.5

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change

%

-0.14

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance

225 N

50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load

422 N

94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load

578 N

129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures

1500 hrs

CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30%

300 hrs

ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244762-06**

Lot # **MM196103**

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil		
ASTM D5199 (Modified)	MIN:	1.518 mm	60 mil	Length	128	m	420	feet
	MAX:	1.62 mm	64 mil	Width	6.86	m	22.5	feet
	AVE:	1.558 mm	61 mil	OIT(Standard)	ASTM D3895	minutes	151	

Specific Gravity	Density	g/cc	.946
ASTM D792			

MFI ASTM D1238

COND. E

GRADE:

7002 Melt Flow Index 190°C /2160 g - g /10 min .25

Carbon Black Content

ASTM D4218

Range % 2.29

Carbon Black Dispersion

ASTM D5596

Category 1

Tensile Strength

ASTM D6693

ASTM D638 (Modified)

(2 inches / minute)

Average Strength @ Yield 24 N/mm 134 ppi 2,241 psi

Average Strength @ Break 48 N/mm 274 ppi 4,568 psi

Elongation ASTM D-6693

ASTM D638 (Modified)

(2 inches / minute)

Lo = 1.3" Yield

Lo = 2.0" Break

Average Elongation @ Yield % 17.85

Average Elongation @ Break % 862.5

Dimensional Stability

ASTM D1204 (Modified)

Average Dimensional Change % -0.14

Tear Resistance

ASTM D1004 (Modified)

Average Tear Resistance 225 N 50.567 lbs

Puncture Resistance

FTMS 101 Method 2065 (Modified)

Load 422 N 94.877 lbs

Puncture Resistance

ASTM D4833 (Modified)

Load 578 N 129.96 lbs

ESCR

ASTM D1693

Minimum Hrs w / o Failures 1500 hrs CERTIFIED

Notched Constant Tensile Load

ASTM D5397

pass / fail @ 30% 300 hrs ONGOING

Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature

Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244763-06**

Lot # **MM196103**

Liner Type: **SMOOTH HDPE**

		METRIC	ENGLISH	Thickness	1.5mm	60mil	
Thickness	MIN:	1.406 mm	55 mil	Length	128	m	420 feet
Measurement				Width	6.86	m	22.5 feet
ASTM D5199	MAX:	1.676 mm	66 mil				
(Modified)	AVE:	1.559 mm	61 mil	OIT(Standard) ASTM D3895	minutes		151

Specific Gravity	Density	g/cc	.946
ASTM D792			

MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.25
GRADE:	7002	

Carbon Black Content	Range	%	2.29
ASTM D4218			

Carbon Black Dispersion	Category	1
ASTM D5596		

Tensile Strength				
ASTM D6693	Average Strength @ Yield	24 N/mm	134 ppi	2,241 psi
ASTM D638 (Modified)				
(2 inches / minute)				

Average Strength @ Break	48 N/mm	274 ppi	4,568 psi
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Elongation ASTM D-6693

ASTM D638 (Modified)	Average Elongation @ Yield	%	17.85
(2 inches / minute)			

Lo = 1.3" Yield

Lo = 2.0" Break	Average Elongation @ Break	%	862.5
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Dimensional Stability

ASTM D1204 (Modified)	Average Dimensional Change	%	-0.14
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Tear Resistance

ASTM D1004 (Modified)	Average Tear Resistance	225 N	50.567 lbs
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Puncture Resistance

FTMS 101 Method 2065 (Modified)	Load	422 N	94.877 lbs
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Puncture Resistance

ASTM D4833 (Modified)	Load	578 N	129.96 lbs
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ESCR

ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load

ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**

PO: **3043**

Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244642-06**

Lot #

MM196106

Liner Type: **SMOOTH HDPE**

Thickness Measurement		METRIC	ENGLISH	Thickness	1.5mm	60mil	
ASTM D5199 (Modified)	MIN:	1.506 mm	59 mil	Length	128	m	420 feet
	MAX:	1.659 mm	65 mil	Width	6.86	m	22.5 feet
	AVE:	1.572 mm	62 mil	OIT(Standard)	ASTM D3895	minutes	157

Specific Gravity	Density	g/cc	.947
ASTM D792			

MFI ASTM D1238			
COND. E	Melt Flow Index 190°C /2160 g - g /10 min		.26
GRADE:	7002		

Carbon Black Content	Range	%	2.25
ASTM D4218			

Carbon Black Dispersion	Category		1
ASTM D5596			

Tensile Strength			
ASTM D6693	Average Strength @ Yield	25 N/mm	144 ppi
ASTM D638 (Modified)			2,405 psi
(2 inches / minute)			

Average Strength @ Break	46 N/mm	265 ppi	4,413 psi
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Elongation ASTM D-6693			
ASTM D638 (Modified)	Average Elongation @ Yield	%	17.01
(2 inches / minute)			

Lo = 1.3" Yield			
Lo = 2.0" Break	Average Elongation @ Break	%	857.5

Dimensional Stability			
ASTM D1204 (Modified)	Average Dimensional Change	%	0.07

Tear Resistance			
ASTM D1004 (Modified)	Average Tear Resistance	235 N	52.726 lbs

Puncture Resistance	Load	492 N	110.59 lbs
FTMS 101 Method 2065 (Modified)			

Puncture Resistance	Load	582 N	130.73 lbs
ASTM D4833 (Modified)			

ESCR	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
ASTM D1693			

Notched Constant Tensile Load	pass / fail @ 30%	300 hrs	ONGOING
ASTM D5397			

Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244647-06** Lot # **MM196106** Liner Type: **SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)	METRIC	ENGLISH	Thickness	1.5mm	60mil		
MIN:	1.538 mm	61 mil	Length	128	m	420	feet
MAX:	1.714 mm	67 mil	Width	6.86	m	22.5	feet
AVE:	1.633 mm	64 mil	OIT(Standard) ASTM D3895	minutes		157	

Specific Gravity ASTM D792 Density g/cc .947

MFI ASTM D1238

COND. E GRADE: 7002 Melt Flow Index 190°C /2160 g - g /10 min .26

Carbon Black Content ASTM D4218 Range % 2.43

Carbon Black Dispersion ASTM D5596 Category 1

Tensile Strength ASTM D6693 Average Strength @ Yield 24 N/mm 140 ppi 2,330 psi
ASTM D638 (Modified) (2 inches / minute)

Average Strength @ Break 47 N/mm 266 ppi 4,429 psi

Elongation ASTM D-6693 Average Elongation @ Yield % 17.71
ASTM D638 (Modified) (2 inches / minute)
Lo = 1.3" Yield
Lo = 2.0" Break Average Elongation @ Break % 885.2

Dimensional Stability ASTM D1204 (Modified) Average Dimensional Change % 0.07

Tear Resistance ASTM D1004 (Modified) Average Tear Resistance 221 N 49.599 lbs

Puncture Resistance FTMS 101 Method 2065 (Modified) Load 461 N 103.67 lbs

Puncture Resistance ASTM D4833 (Modified) Load 561 N 126.15 lbs

ESCR ASTM D1693 Minimum Hrs w / o Failures 1500 hrs CERTIFIED

Notched Constant Tensile Load ASTM D5397 pass / fail @ 30% 300 hrs ONGOING

Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05



quality certificate

ROLL # **244648-06**

Lot # **MM196106**

Liner Type: **SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH	Thickness	1.5mm	60mil	
	MIN:	1.424 mm	56 mil	Length	128	m	420 feet
	MAX:	1.736 mm	68 mil	Width	6.86	m	22.5 feet
	AVE:	1.581 mm	62 mil	OIT(Standard) ASTM D3895	minutes		157

Specific Gravity ASTM D792	Density	g/cc	.947
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MFI ASTM D1238

COND. E	Melt Flow Index 190°C /2160 g - g /10 min	.26
GRADE:	7002	

Carbon Black Content ASTM D4218	Range	%	2.43
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Carbon Black Dispersion ASTM D5596	Category	1
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Tensile Strength ASTM D6693	Average Strength @ Yield	24 N/mm	140 ppi	2,330 psi
ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Break	47 N/mm	266 ppi	4,429 psi

Elongation ASTM D-6693	Average Elongation @ Yield	%	17.71
ASTM D638 (Modified) (2 inches / minute)	Average Elongation @ Break	%	885.2
Lo = 1.3" Yield			
Lo = 2.0" Break			

Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%	0.07
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Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	221 N	49.599 lbs
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Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461 N	103.67 lbs
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Puncture Resistance ASTM D4833 (Modified)	Load	561 N	126.15 lbs
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ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs	CERTIFIED
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Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs	ONGOING
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Customer: **AG Services**
PO: **3043**
Destination **Roswell, NM**

Date: **11-6-06**

Signature: *[Signature]*
Quality Control Department

60HDSM.FRM
REV 06
12/23/05