



quality certificate

ROLL # **F14C054067** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|---------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.65 mm | ENGLISH 104 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 3.051 mm | 120 mil | | | | | |
| | AVE: | 2.762 mm | 109 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .935 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.34 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 71 N/mm | 406 ppi | 5,080 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 929.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.18 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 356 N | 80.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 600 N | 135 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 836 N | 188 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054068** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.516 mm | ENGLISH 99 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 3.012 mm | 119 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.722 mm | 107 mil | OIT(Standard) ASTM D3895 | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.34 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 71 N/mm | 406 ppi | 5,080 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 929.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 356 N | | 80.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 600 N | | 135 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054069** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|---------------------------|--------------------------|----------------------------------|--------------------|--------------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.641 mm | ENGLISH 104 mil | Thickness Length | 2.5mm 102.109 m | 100mil m | 335 feet |
| | MAX: | 3.064 mm | 121 mil | Width | 7.01 m | 23.0 m | feet |
| | AVE: | 2.77 mm | 109 mil | OIT(Standard) ASTM D3895 | minutes | | 193 |
| Specific Gravity ASTM D792 | Density | | | g/cc | | | .935 |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 |
| Carbon Black Content ASTM D4218 | Range | | | % | | | 2.34 |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 In Cat 1 |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 71 N/mm | 406 ppi | | 5,080 psi |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | | 929.0 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | | -0.18 |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 356 N | | | 80.000 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 600 N | | | 135 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | | 188 lbs |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | | CERTIFIED |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054070** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|---------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.592 mm | ENGLISH 102 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.81 mm | 111 mil | | | | | |
| | AVE: | 2.688 mm | 106 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .935 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.23 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 71 N/mm | 406 ppi | 5,080 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 929.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.18 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 356 N | 80.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 600 N | 135 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 836 N | 188 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054071** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|---------|--------------------------|---------|--------|-------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC | ENGLISH | Thickness | 2.5mm | 100mil | |
| | | 2.62 mm | 103 mil | Length | 102.109 | m | 335 feet |
| | MAX: | 3.03 mm | 119 mil | Width | 7.01 | m | 23.0 feet |
| | AVE: | 2.762 mm | 109 mil | OIT(Standard) ASTM D3895 | minutes | | 193 |
| Specific Gravity ASTM D792 | Density | | | g/cc | | | .935 |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 |
| Carbon Black Content ASTM D4218 | Range | | | % | | | 2.23 |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 In Cat 1 |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 71 N/mm | 406 ppi | | 5,080 psi |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | | 929.0 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | | -0.18 |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 356 N | | | 80.000 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 600 N | | | 135 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | | 188 lbs |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | | | CERTIFIED |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054072** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|---------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.572 mm | ENGLISH 101 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.988 mm | 118 mil | | | | | |
| | AVE: | 2.705 mm | 106 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | | Density | | g/cc | | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 | |
| Carbon Black Content ASTM D4218 | | Range | | % | | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | 69 N/mm | 396 ppi | | 4,946 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | % | | | 908.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | % | | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | 342 N | | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | 605 N | | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | 841 N | | | 189 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054073** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.503 mm | ENGLISH 99 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.966 mm | 117 mil | | | | | |
| | AVE: | 2.648 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .31 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 396 ppi | 4,946 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 908.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054074** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.461 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.97 mm | 117 mil | | | | | |
| | AVE: | 2.639 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 396 ppi | | 4,946 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | | 908.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 342 N | | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 605 N | | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 841 N | | | 189 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054075** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.447 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.961 mm | 117 mil | | | | | |
| | AVE: | 2.623 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .31 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.27 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 396 ppi | 4,946 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 908.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054076** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.403 mm | ENGLISH 95 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.882 mm | 113 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.595 mm | 102 mil | OIT(Standard) ASTM D3895 | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.27 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 396 ppi | 4,946 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 908.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054077** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.399 mm | ENGLISH 94 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.862 mm | 113 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.534 mm | 100 mil | OIT(Standard) ASTM D3895 | minutes | 193 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .31 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.20 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 66 N/mm | 376 ppi | 4,698 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 850.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054078** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.352 mm | ENGLISH 93 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.863 mm | 113 mil | | | | | |
| | AVE: | 2.536 mm | 100 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .31 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.20 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 66 N/mm | 376 ppi | 4,698 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 850.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C054079** Lot # **CDH812020** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.314 mm | ENGLISH 91 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.831 mm | 111 mil | | | | | |
| | AVE: | 2.532 mm | 100 mil | OIT(Standard) ASTM D3895 | | minutes | 193 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .31 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.20 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 66 N/mm | 376 ppi | 4,698 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 850.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.18 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 605 N | | 136 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 841 N | | 189 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/30/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055083** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.507 mm | ENGLISH 99 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 3.025 mm | 119 mil | | | | | |
| | AVE: | 2.689 mm | 106 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.37 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 67 N/mm | 380 ppi | 4,750 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 841.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055084** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.497 mm | ENGLISH 98 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 3.036 mm | 120 mil | | | | | |
| | AVE: | 2.703 mm | 106 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .936 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.37 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 67 N/mm | 380 ppi | 4,750 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 841.5 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 325 N | 73.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 592 N | 133 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 796 N | 179 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055085** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.517 mm | ENGLISH 99 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 3.031 mm | 119 mil | | | | | |
| | AVE: | 2.69 mm | 106 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | | 2.22 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 67 N/mm | 380 ppi | | 4,750 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | | 841.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 325 N | | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 592 N | | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 796 N | | | 179 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055086** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|---------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.533 mm | ENGLISH 100 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 3.03 mm | 119 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.699 mm | 106 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.22 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 67 N/mm | 380 ppi | 4,750 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 841.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055087** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|---------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.546 mm | ENGLISH 100 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 3 mm | 118 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.66 mm | 105 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.34 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 71 N/mm | 404 ppi | 5,046 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 896.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055088** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.48 mm | ENGLISH 98 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.984 mm | 117 mil | | | | | |
| | AVE: | 2.656 mm | 105 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.34 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 404 ppi | 5,046 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 896.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055089** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.458 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.95 mm | 116 mil | | | | | |
| | AVE: | 2.632 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.34 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 404 ppi | 5,046 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 896.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055090** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.466 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.94 mm | 116 mil | | | | | |
| | AVE: | 2.624 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.33 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 404 ppi | 5,046 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 896.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055091** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.436 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.97 mm | 117 mil | | | | | |
| | AVE: | 2.621 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.33 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 404 ppi | 5,046 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 896.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 325 N | | 73.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 592 N | | 133 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 796 N | | 179 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055092** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.448 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.943 mm | 116 mil | | | | | |
| | AVE: | 2.635 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.29 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 407 ppi | 5,086 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 903.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055093** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.474 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.984 mm | 117 mil | | | | | |
| | AVE: | 2.629 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.29 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 407 ppi | 5,086 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 903.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055094** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.449 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.95 mm | 116 mil | | | | | |
| | AVE: | 2.648 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .934 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.29 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 71 N/mm | 407 ppi | 5,086 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 903.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 347 N | 78.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 627 N | 141 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 774 N | 174 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055095** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.49 mm | ENGLISH 98 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.973 mm | 117 mil | | | | | |
| | AVE: | 2.626 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .934 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.22 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 71 N/mm | 407 ppi | 5,086 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 903.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 347 N | 78.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 627 N | 141 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 774 N | 174 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055096** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.488 mm | ENGLISH 98 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.943 mm | 116 mil | | | | | |
| | AVE: | 2.617 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.22 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 71 N/mm | 407 ppi | 5,086 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 903.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C055097** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.468 mm | ENGLISH 97 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.97 mm | 117 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.643 mm | 104 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.33 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,852 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 872.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **1/31/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056098** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.454 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.958 mm | 116 mil | | | | | |
| | AVE: | 2.613 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.33 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,852 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 872.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056099** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.458 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.949 mm | 116 mil | | | | | |
| | AVE: | 2.629 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | | 2.33 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 68 N/mm | 388 ppi | | 4,852 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | | 872.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 347 N | | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 627 N | | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 774 N | | | 174 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056100** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.473 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.966 mm | 117 mil | | | | | |
| | AVE: | 2.628 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.32 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,852 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 872.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056101** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.498 mm | ENGLISH 98 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.964 mm | 117 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.638 mm | 104 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .934 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.32 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,852 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 872.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 347 N | | 78.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 627 N | | 141 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 774 N | | 174 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056102** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.46 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.923 mm | 115 mil | | | | | |
| | AVE: | 2.619 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,854 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 863.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056103** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.471 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.566 mm | 101 mil | | | | | |
| | AVE: | 2.633 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,854 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 863.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056104** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.487 mm | ENGLISH 98 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.957 mm | 116 mil | | | | | |
| | AVE: | 2.634 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.31 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,854 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 863.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056105** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---------------------------------|----------------------------|---|----------------|--------------------------|------------------|-------------------|--------------------|
| Thickness | | METRIC | ENGLISH | Thickness | 2.5mm | 100mil | |
| Measurement | MIN: | 2.465 mm | 97 mil | Length | 102.109 m | 335 feet | |
| ASTM D5199 | MAX: | 2.939 mm | 116 mil | Width | 7.01 m | 23.0 feet | |
| (Modified) | AVE: | 2.63 mm | 104 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity | Density | | | | | | |
| ASTM D792 | | | | | | | .935 |
| MFI ASTM D1238 | | | | | | | |
| COND. E | | | | | | | |
| GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 |
| Carbon Black Content | Range | | | | | | |
| ASTM D4218 | | | | | | | 2.28 |
| Carbon Black Dispersion | Category | | | | | | |
| ASTM D5596 | | | | | | | 10 In Cat 1 |
| Tensile Strength | | | | | | | |
| ASTM D6693 | | | | | | | |
| ASTM D638 (Modified) | | | | | | | |
| (2 inches / minute) | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,854 psi | |
| Elongation ASTM D-6693 | | | | | | | |
| ASTM D638 (Modified) | | | | | | | |
| (2 inches / minute) | Average Elongation @ Break | | | | | | 863.0 |
| Lo = 1.3" Yield | | | | | | | |
| Lo = 2.0" Break | | | | | | | |
| Dimensional Stability | | | | | | | |
| ASTM D1204 (Modified) | Average Dimensional Change | | | | | | -0.20 |
| Tear Resistance | | | | | | | |
| ASTM D1004 (Modified) | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance | Load | | | 636 N | | 143 lbs | |
| FTMS 101 Method 2065 (Modified) | | | | | | | |
| Puncture Resistance | Load | | | 805 N | | 181 lbs | |
| ASTM D4833 (Modified) | | | | | | | |
| ESCR | Minimum Hrs w / o Failures | | | 1500 hrs | | | CERTIFIED |
| ASTM D1693 | | | | | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056106** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.45 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.964 mm | 117 mil | | | | | |
| | AVE: | 2.651 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.28 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 68 N/mm | 388 ppi | 4,854 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 863.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056107** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.46 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.993 mm | 118 mil | | | | | |
| | AVE: | 2.645 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.38 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 67 N/mm | 384 ppi | 4,804 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 881.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056108** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.46 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.91 mm | 115 mil | | | | | |
| | AVE: | 2.64 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.38 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 67 N/mm | 384 ppi | 4,804 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 881.0 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056109** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.45 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.95 mm | 116 mil | | | | | |
| | AVE: | 2.674 mm | 105 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .935 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.38 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 67 N/mm | 384 ppi | 4,804 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 881.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 342 N | 77.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 636 N | 143 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 805 N | 181 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056110** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.454 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.927 mm | 115 mil | | | | | |
| | AVE: | 2.642 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .935 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.28 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 67 N/mm | 384 ppi | 4,804 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 881.0 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 342 N | 77.000 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 636 N | 143 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 805 N | 181 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056111** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.485 mm | ENGLISH 98 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.931 mm | 115 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.641 mm | 104 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .935 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.28 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 67 N/mm | 384 ppi | 4,804 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 881.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 342 N | | 77.000 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 636 N | | 143 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 805 N | | 181 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056112** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.462 mm | ENGLISH 97 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.918 mm | 115 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.618 mm | 103 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.26 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 392 ppi | 4,899 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 869.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056113** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.458 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.927 mm | 115 mil | | | | | |
| | AVE: | 2.629 mm | 104 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.26 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 392 ppi | 4,899 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 869.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | 1500 hrs | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C056114** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.431 mm | ENGLISH 96 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.935 mm | 116 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.62 mm | 103 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.26 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 392 ppi | 4,899 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 869.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/1/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057115** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.47 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.928 mm | 115 mil | | | | | |
| | AVE: | 2.603 mm | 102 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .936 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.29 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 69 N/mm | 392 ppi | 4,899 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 869.5 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 340 N | 76.500 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 623 N | 140 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 836 N | 188 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057116** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.44 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.923 mm | 115 mil | | | | | |
| | AVE: | 2.627 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.29 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 392 ppi | 4,899 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 869.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057117** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.443 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.926 mm | 115 mil | | | | | |
| | AVE: | 2.613 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.26 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 876.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | CERTIFIED | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057118** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|-------------|---|--------------------------|------------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.464 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.929 mm | 115 mil | | | | | |
| | AVE: | 2.614 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | | Range | | | % | | 2.26 | |
| Carbon Black Dispersion ASTM D5596 | | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | | Average Strength @ Break | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | | Average Elongation @ Break | | | % | | 876.5 | |
| Dimensional Stability ASTM D1204 (Modified) | | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057119** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.455 mm | ENGLISH 97 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.93 mm | 115 mil | | | | | |
| | AVE: | 2.626 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .936 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | | .30 |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.26 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 876.5 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 340 N | 76.500 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 623 N | 140 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 836 N | 188 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057120** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.449 mm | ENGLISH 96 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.944 mm | 116 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.626 mm | 103 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.37 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 876.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057121** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.439 mm | ENGLISH 96 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.92 mm | 115 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.621 mm | 103 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.37 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 876.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057122** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|---|-------------------------|---------------------------|--------------|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.444 mm | ENGLISH 96 mil | Thickness Length Width | 2.5mm 102.109 7.01 | 100mil m m | 335 23.0 | feet feet |
| | MAX: | 2.89 mm | 114 mil | | | | | |
| | AVE: | 2.62 mm | 103 mil | OIT(Standard) ASTM D3895 | | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | | g/cc | .936 | | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | | % | 2.37 | | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | 10 In Cat 1 | | | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | | % | 876.5 | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | | % | -0.20 | | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | | 340 N | 76.500 lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | | 623 N | 140 lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | | 836 N | 188 lbs | | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | 1500 hrs | | | CERTIFIED | | | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14



quality certificate

ROLL # **F14C057123** Lot # **CDH812030** Liner Type: **SMOOTH LLDPE**

| | | | | | | | |
|---|----------------------------|---|--------------------------|--------------------------|----------------------------------|----------------------------------|--|
| Thickness Measurement ASTM D5199 (Modified) | MIN: | METRIC 2.488 mm | ENGLISH 98 mil | Thickness Length | 2.5mm 102.109 m | 100mil 335 feet | |
| | MAX: | 2.725 mm | 107 mil | Width | 7.01 m | 23.0 feet | |
| | AVE: | 2.593 mm | 102 mil | OIT(Standard) ASTM D3895 | minutes | 202 | |
| Specific Gravity ASTM D792 | Density | | | g/cc | | .936 | |
| MFI ASTM D1238 COND. E GRADE: | 7104 | Melt Flow Index 190°C /2160 g - g /10 min | | | | .30 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | 2.37 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 In Cat 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute) | Average Strength @ Break | | | 69 N/mm | 394 ppi | 4,923 psi | |
| Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Break | | | % | | 876.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional Change | | | % | | -0.20 | |
| Tear Resistance ASTM D1004 (Modified) | Average Tear Resistance | | | 340 N | | 76.500 lbs | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | | | 623 N | | 140 lbs | |
| Puncture Resistance ASTM D4833 (Modified) | Load | | | 836 N | | 188 lbs | |
| ESCR ASTM D1693 | Minimum Hrs w / o Failures | | | 1500 hrs | | CERTIFIED | |

Customer: **Erosion Control Applications**
PO: **13012 CC & VMLE2 Squaw Gulch ph1**
Destination **Cripple Creek, CO**

Date: **2/2/14**

Signature: 
Quality Control Department

100LLSM.FRM
REV 01
1/21/14

Appendix I.6

Secondary (100-mil LLDPE SSMS) Geomembrane Resin Quality Control Certificates



Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88772984
PO #: 007935
Weight: 190850 LB
Ship Date: 12/21/2013
Package: BULK
Mode: Hopper Car
Car #: CEFX054223
Seal No: 550196

Product: PE 7104 BULK

Lot Number: CDN810200

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.34 | g/10mi |
| HLMI | ASTM D1238 | 14.47 | g/10mi |
| Pellet Count | ST-905 | 33 | pel/g |
| Production date | | 20131204 | |
| Density | D1505 or D4883 | 0.919 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.

Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88772985
PO #: 007935
Weight: 189000 LB
Ship Date: 12/21/2013
Package: BULK
Mode: Hopper Car
Car #: NAHX610020
Seal No: 542563

Product: PE 7104 BULK

Lot Number: CDH812030

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.30 | g/10mi |
| HLMI | ASTM D1238 | 13.26 | g/10mi |
| Pellet Count | ST-905 | 34 | pel/g |
| Production date | | 20130831 | |
| Density | D1505 or D4883 | 0.921 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery # 88772983
PO #: 007935
Weight: 188700 LB
Ship Date: 12/21/2013
Package: BULK
Mode: Hopper Car
Car #: CHVX898073
Seal No: 550194

Product: PE 7104 BULK

Lot Number: CDH810210

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.33 | g/10mi |
| HLMI | ASTM D1238 | 15.20 | g/10mi |
| Pellet Count | ST-905 | 35 | pel/g |
| Production date | | 20131205 | |
| Density | D1505 or D4883 | 0.919 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPCChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806



Lili Cui, Ph.D., Geomembrane Technical Service & Applications Development
Room 154 PTC ■ Bartlesville, OK 74004 ■
918-661-1897 ■ cuil@cpchem.com ■ Fax: 918-662-2220 ■ www.cpchem.com

June 8, 2012

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

This letter is to report the final results of oven-aging and UV-aging tests (according to GRI-GM13 and GRI-GM17) on Agru America sheet samples that you provided to us in 2011. These tests were performed by CPChem's Materials Evaluation Laboratory in Bartlesville, OK. The tests were completed April 2012.

The GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) durability tests were done according to the following procedures.

| Test | Exposure | Method |
|------------|--|--------|
| HP-OIT | 150 °C, 500 psi oxygen | D5885 |
| Oven Aging | 90 days, 85 °C | D5721 |
| UV Aging | 1600 UV hrs (Conditions were 20 hours UVA-340 at 75 °C followed by 4 hrs dark with condensation at 60 °C. Irradiance was 0.72 W/m ² at 340 nm.) | D7238 |

Oven-Aging Results

| Sample | Initial HP-OIT (min) | HP-OIT Value after Oven Aging (min) | % HP-OIT Retained | GRI-GM13 or GRI-GM17 % Retained Requirement |
|--|----------------------|-------------------------------------|-------------------|---|
| 40 mil LLDPE Roll # 346550-11 from Marlex [®] 7104 Polyethylene Lot # CBC810430 | 659 | 572 | 87 | 60 |
| 60 mil HDPE Roll # 447108-11 from Marlex [®] K307 Polyethylene Lot # 71-1-1104 | 1136 | 994 | 88 | 80 |

UV-Aging Results

| Sample | Initial HP-OIT (min) | HP-OIT Value after UV Aging (min) | % HP-OIT Retained | GRI-GM13 or GRI-GM17 % Retained Requirement |
|--|----------------------|-----------------------------------|-------------------|---|
| 40 mil LLDPE Roll # 346550-11 from Marlex [®] 7104 Polyethylene Lot # CBC810430 | 659 | 449 | 68 | 35 |
| 60 mil HDPE Roll # 447108-11 from Marlex [®] K307 Polyethylene Lot # 71-1-1104 | 1136 | 924 | 81 | 50 |

According to these test results, the durability requirements are met.

If you have any questions, please call me at 918-661-1897.

Sincerely,

A handwritten signature in black ink, appearing to read "Lili Cui". The signature is fluid and cursive, with the first name "Lili" and last name "Cui" clearly distinguishable.

Lili Cui, Ph.D.
Geomembrane Technical Service & Applications Development

*Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given **without warranty or guarantee** and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application. **You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***



Lili Cui, Polyethylene Tech Service and Applications Development
Room 154 PTC ■ Bartlesville, OK 74003 ■
918-977- 4685 ■ cuill@cpchem.com ■ Fax: 918-977-7599 ■ www.cpchem.com

July 10, 2013

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

Per your request for this information, there has been no change to the additive formulation specifications of Marlex[®] 7104 and Marlex[®] K307 polyethylene resins since GRI-GM13 and GRI-GM17 oven- and UV-aging testing was performed on Agru America sheet from these resins in December 2012.

If you have any questions, please call me at 918-977-4685.

Sincerely,

A handwritten signature in black ink that reads "Lili Cui". The signature is fluid and cursive, with the first name "Lili" and last name "Cui" clearly distinguishable.

Lili Cui, Ph.D.
Polyethylene Tech Service and Applications Development

*Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given **without warranty or guarantee** and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application. **You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***

Appendix I.7

Primary (100-mil LLDPE Smooth) Geomembrane Resin Quality Control Certificates

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88713596
PO #: 007699
Weight: 179000 LB
Ship Date: 09/10/2013
Package: BULK
Mode: Hopper Car
Car #: PSPX006890
Seal No: 542416

Product: PE 7104 BULK

Lot Number: CDH811430

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.33 | g/10mi |
| HLMI | ASTM D1238 | 15.04 | g/10mi |
| Pellet Count | ST-905 | 33 | pel/g |
| Production date | | 20130821 | |
| Density | D1505 or D4883 | 0.918 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806



Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88734029
PO #: 007786
Weight: 189750 LB
Ship Date: 10/15/2013
Package: BULK
Mode: Hopper Car
Car #: NAHX620028
Seal No: 542564

Product: PE 7104 BULK

Lot Number: CDH812050

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.32 | g/10mi |
| HLMI | ASTM D1238 | 13.64 | g/10mi |
| Pellet Count | ST-905 | 33 | pel/g |
| Production date | | 20130831 | |
| Density | D1505 or D4883 | 0.920 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.

Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88772987
PO #: 007935
Weight: 188250 LB
Ship Date: 12/21/2013
Package: BULK
Mode: Hopper Car
Car #: SHPX463703
Seal No: 542562

Product: PE 7104 BULK

Lot Number: CDH812020

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.31 | g/10mi |
| HLMI | ASTM D1238 | 13.83 | g/10mi |
| Pellet Count | ST-905 | 32 | pel/g |
| Production date | | 20130830 | |
| Density | D1505 or D4883 | 0.921 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806



Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88772985
PO #: 007935
Weight: 189000 LB
Ship Date: 12/21/2013
Package: BULK
Mode: Hopper Car
Car #: NAHX610020
Seal No: 542563

Product: PE 7104 BULK

Lot Number: CDH812030

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.30 | g/10mi |
| HLMI | ASTM D1238 | 13.26 | g/10mi |
| Pellet Count | ST-905 | 34 | pel/g |
| Production date | | 20130831 | |
| Density | D1505 or D4883 | 0.921 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.

Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806



Lili Cui, Ph.D., Geomembrane Technical Service & Applications Development
Room 154 PTC ■ Bartlesville, OK 74004 ■
918-661-1897 ■ cuil@cpchem.com ■ Fax: 918-662-2220 ■ www.cpchem.com

June 8, 2012

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

This letter is to report the final results of oven-aging and UV-aging tests (according to GRI-GM13 and GRI-GM17) on Agru America sheet samples that you provided to us in 2011. These tests were performed by CPChem's Materials Evaluation Laboratory in Bartlesville, OK. The tests were completed April 2012.

The GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) durability tests were done according to the following procedures.

| Test | Exposure | Method |
|------------|--|--------|
| HP-OIT | 150 °C, 500 psi oxygen | D5885 |
| Oven Aging | 90 days, 85 °C | D5721 |
| UV Aging | 1600 UV hrs (Conditions were 20 hours UVA-340 at 75 °C followed by 4 hrs dark with condensation at 60 °C. Irradiance was 0.72 W/m ² at 340 nm.) | D7238 |

Oven-Aging Results

| Sample | Initial HP-OIT (min) | HP-OIT Value after Oven Aging (min) | % HP-OIT Retained | GRI-GM13 or GRI-GM17 % Retained Requirement |
|--|----------------------|-------------------------------------|-------------------|---|
| 40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430 | 659 | 572 | 87 | 60 |
| 60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104 | 1136 | 994 | 88 | 80 |

UV-Aging Results

| Sample | Initial HP-OIT (min) | HP-OIT Value after UV Aging (min) | % HP-OIT Retained | GRI-GM13 or GRI-GM17 % Retained Requirement |
|--|----------------------|-----------------------------------|-------------------|---|
| 40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430 | 659 | 449 | 68 | 35 |
| 60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104 | 1136 | 924 | 81 | 50 |

According to these test results, the durability requirements are met.

If you have any questions, please call me at 918-661-1897.

Sincerely,

A handwritten signature in black ink, appearing to read "Lili Cui". The signature is fluid and cursive, with the first name "Lili" and last name "Cui" clearly distinguishable.

Lili Cui, Ph.D.
Geomembrane Technical Service & Applications Development

*Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given **without warranty or guarantee** and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application. **You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***



Lili Cui, Polyethylene Tech Service and Applications Development
Room 154 PTC ■ Bartlesville, OK 74003 ■
918-977- 4685 ■ cuill@cpchem.com ■ Fax: 918-977-7599 ■ www.cpchem.com

July 10, 2013

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

Per your request for this information, there has been no change to the additive formulation specifications of Marlex[®] 7104 and Marlex[®] K307 polyethylene resins since GRI-GM13 and GRI-GM17 oven- and UV-aging testing was performed on Agru America sheet from these resins in December 2012.

If you have any questions, please call me at 918-977-4685.

Sincerely,

A handwritten signature in black ink that reads "Lili Cui". The signature is fluid and cursive, with the first name "Lili" and last name "Cui" clearly distinguishable.

Lili Cui, Ph.D.
Polyethylene Tech Service and Applications Development

*Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given **without warranty or guarantee** and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application. **You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***

Appendix I.8

Welding Rod Resin Quality Control Certificates



WELDING ROD CERTIFICATE OF CONFORMITY

Welding Rod Thickness : **5mm**

Lot Number : **CDN 810330**

Material: **7104**

| | | Test Results |
|--|---------------|--------------------------|
| Carbon Black Content : ASTM D4218 | | 2.14 % |
| Melt Flow Index : Cond. E ASTM D1238 | 190°C / 2160g | .35 g / 10min |
| Specific Gravity : ASTM D792 / D1505 | | .935 g / cm ³ |

CUSTOMER : Erosion Control

P. O. # : 14084 CC&V Squaw Gulch VLF

DESTINATION : Cripple Creek, CO

Signature : 

Date : 3-4-14

Mgr., Quality Control Department

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88775293
PO #: 007935
Weight: 188150 LB
Ship Date: 12/30/2013
Package: BULK
Mode: Hopper Car
Car #: CEFX053876
Seal No: 550295

Product: PE 7104 BULK

Lot Number: CDN810330

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.35 | g/10mi |
| HLMI | ASTM D1238 | 14.36 | g/10mi |
| Pellet Count | ST-905 | 32 | pel/g |
| Production date | | 20131207 | |
| Density | D1505 or D4883 | 0.919 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806



WELDING ROD CERTIFICATE OF CONFORMITY

Welding Rod Thickness : **5mm**

Lot Number : **CDF 811450**

Material: **7104**

Test
Results

Carbon Black Content :
ASTM D4218

2.22 %

Melt Flow Index : 190°C / 2160g
Cond. E
ASTM D1238

.31 g / 10min

Specific Gravity :
ASTM D792 / D1505

.936 g / cm³

CUSTOMER : Erosion Control

P. O. # : 14084 CC&V Squaw Gulch VLF

DESTINATION : Cripple Creek, CO

Signature : 

Date : **3-4-14**

Mgr., Quality Control Department

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 EAST NEWLANDS
FERNLEY NV 89408
USA

Recipient: PALMER
Fax:

Delivery #: 88686583
PO #: 007539
Weight: 189550 LB
Ship Date: 07/21/2013
Package: BULK
Mode: Hopper Car
Car #: NAHX610346
Seal No: 543532

Product: PE 7104 BULK

Lot Number: CDF811450

| Property | Test Method | Value | Unit |
|-----------------|----------------|----------|--------|
| Melt Index | ASTM D1238 | 0.31 | g/10mi |
| HLMI | ASTM D1238 | 13.88 | g/10mi |
| Pellet Count | ST-905 | 33 | pel/g |
| Production date | | 20130625 | |
| Density | D1505 or D4883 | 0.919 | g/cm3 |

WAIVED BY GUNTHER NIEDERMOSER

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
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.



Kevin Ayres
Quality Control Supervisor

For CoA questions contact Customer Service Representative at +1-832-813-4806

Appendix I.9

Geotextile Quality Control Certificates



February 20, 2012

Bowman Construction Supply
Attn: Ken Kinnard
10801 E 54th St
Denver, CO 80239

Reference: American Recovery & Reinvestment Acts (ARRA)
Buy American Requirement FAR 25.6

Dear Ken:

This letter is to certify that the Western Excelsior nonwoven geotextiles meet the manufactured in the United States requirement of the American Recovery & Reinvestment Acts (ARRA) and the Buy American Requirement FAR 25.6

If you have any questions regarding this, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Keith Gregory". The signature is fluid and cursive, with the first name "Keith" and last name "Gregory" clearly distinguishable.

Keith Gregory
704-200-4912



Certificate of Compliance

February 16, 2012

Ames Construction
Mr. Eric Marolf
PO Box 163

Project: Ball Mill Fill Earthwork
Victor Cripple Creek Mine

Victor, CO 80860

Ref: 12.0N (Lot # 27218-03)

This letter is to certify that WEC 12.0N is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. WEC 12.0N resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. Excel 12.0N meets or exceeds the physical property values listed below:

| PROPERTY | TEST METHOD | UNIT | M.A.R.V. (Minimum Average Roll Value) |
|-------------------------|-------------|-------------------|--|
| Weight | ASTM D 5261 | oz | 12.0 |
| Grab Tensile | ASTM D 4632 | lbs | 300 |
| Grab Elongation | ASTM D 4632 | % | 50 |
| Trapezoid Tear Strength | ASTM D 4533 | lbs | 115 |
| Puncture Resistance | ASTM D 4833 | lbs | 180 |
| CBR Puncture | ASTM D 6241 | lbs | 850 |
| Permittivity* | ASTM D 4491 | sec ⁻¹ | 1 |
| AOS* | ASTM D 4751 | US Sieve (mm) | 100 |
| UV Resistance | ASTM D 4355 | %/hrs | 70/500 |

Sincerely,

Keith Gregory
Technical Sales Manager

I hereby certify under penalty of perjury that the material listed in this
Certified Test Report represents 1500sy (quantity) of pay item

Pay Item:

Project Name: Ball Mill Fill Earthwork

Project Number: 090601-400

Bowman Construction Supply
Contract Supplier - Bowman Construction Supply

2/21/12
Date



Certificate of Testing

February 16, 2012

Ames Construction
Mr. Eric Marolf
PO Box 163

Victor, CO 80860

Project: Ball Mill Fill Earthwork
Victor Cripple Creek Mine

Ref: 12.0N (Lot # 27218-03)

This letter is to certify that WEC 12.0N Geotextile stated herein, tested at following values:

| WEC 12.0N | WEC 12.0N | Weight | Grab Tensile MD | Elongation MD | Grab Tensile CD | Elongation CD | Trap Tear MD | Trap Tear CD | Puncture | AOS | Flow Rate | Permittivity |
|-------------|------------|-------------|-----------------|---------------|-----------------|---------------|--------------|--------------|------------|--------------|------------|--------------|
| Roll Number | Lot Number | ASTM D 5261 | ASTM D4632 | ASTM D4633 | ASTM D4634 | ASTM D4635 | ASTM D4633 | ASTM D4633 | ASTM D4833 | ASTM D4751 | ASTM D4491 | ASTM D4491 |
| | | oz/sy | lbs | % | lbs | lbs | lbs | lbs | lbs | US Std Sieve | gal/min/sf | sec-1 |
| 30374164 | 27218-03 | 12.48 | 314 | 76 | 340 | 78 | 124 | 137 | 194 | 100 | 85 | 1.13 |
| 30374173 | 27218-03 | 12.36 | 309 | 78 | 336 | 80 | 120 | 143 | 186 | 100 | 85 | 1.13 |
| 30374174 | 27218-03 | 12.36 | 309 | 78 | 336 | 80 | 120 | 143 | 18 | 100 | 85 | 1.13 |

Sincerely,

Keith Gregory

Keith Gregory - Technical Sales Manager

I hereby certify under penalty of perjury that the material listed in this
Certified Test Report represents 1500sf (quantity) of pay item

Pay Item:

Project Name: Ball Mill Fill Earthwork Project Number: 090601-400

Bella Smith 2/24/12
Contract Supplier - Bowman Construction Supply Date



March 14, 2012

Ames Construction
Mr. Eric Marolf
PO Box 163

Project: Ball Mill Fill Earthwork
Victor Cripple Creek Mine

Victor, CO 80860

Ref: 12.0N (Lot # 8192011)

This letter is to certify that WEC 12.0N is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. WEC 12.0N resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. Excel 12.0N meets or exceeds the physical property values listed below:

| PROPERTY | TEST METHOD | UNIT | M.A.R.V. (Minimum Average Roll Value) |
|-------------------------|-------------|-------------------|--|
| Weight | ASTM D 5261 | oz | 12.0 |
| Grab Tensile | ASTM D 4632 | lbs | 300 |
| Grab Elongation | ASTM D 4632 | % | 50 |
| Trapezoid Tear Strength | ASTM D 4533 | lbs | 115 |
| Puncture Resistance | ASTM D 4833 | lbs | 180 |
| CBR Puncture | ASTM D 6241 | lbs | 850 |
| Permittivity* | ASTM D 4491 | sec ⁻¹ | 1 |
| AOS* | ASTM D 4751 | US Sieve (mm) | 100 |
| UV Resistance | ASTM D 4355 | %/hrs | 70/500 |

Sincerely,

A handwritten signature in blue ink, appearing to read "Keith Gregory", is written over a horizontal line.

Keith Gregory

I hereby certify under penalty of perjury that the material listed in this
Certified Test Report represents 1000sy (quantity) of pay item

Pay Item:

Project Name: Ball Mill Fill Earthwork Project Number: 09 0601-400

Bowman Supply
Contract Supplier - Bowman Construction Supply

3/14/12
Date



Certificate of Testing

March 14, 2012

Ames Construction
Mr. Eric Marolf
PO Box 163

Project: Ball Mill Fill Earthwork
Victor Cripple Creek Mine

Victor, CO 80860

Ref: 12.0N (Lot #8192011)

This letter is to certify that WEC 12.0N Geotextile stated herein, tested at following values:

| WEC 12.0N | WEC 12.0N | Weight | Grab Tensile MD | Elongation MD | Grab Tensile CD | Elongation CD | Trap Tear MD | Trap Tear CD | Puncture | AOS | Flow Rate | Permittivity |
|-------------|------------|-------------|-----------------|---------------|-----------------|---------------|--------------|--------------|------------|--------------|------------|--------------|
| Roll Number | Lot Number | ASTM D 5261 | ASTM D4632 | ASTM D4633 | ASTM D4634 | ASTM D4635 | ASTM D4533 | ASTM D4533 | ASTM D4833 | ASTM D4751 | ASTM D4491 | ASTM D4491 |
| | | oz/sy | lbs | % | lbs | lbs | lbs | lbs | lbs | US Std Sieve | gal/min/sf | sec-1 |
| 020272918 | 8192011 | 12.67 | 342 | 77 | 363 | 88 | 139 | 152 | 199 | 100 | 73 | 0.98 |
| 020272928 | 8192011 | 12.29 | 338 | 72 | 359 | 83 | 133 | 149 | 191 | 100 | 73 | 0.98 |

Sincerely,

Keith Gregory

I hereby certify under penalty of perjury that the material listed in this
Certified Test Report represents 1000sy (quantity) of pay item

Pay Item:

Project Name: Ball Mill Fill Earthwork Project Number: 090601-400

Bullock-Johnson Date: 3/14/12

Contract Supplier - Bowman Construction Supply



August 19, 2011

RE: Buy America Act – Construction Materials Federal Acquisition Regulation 52.225-9

The following Mirafi® products are manufactured and produced in the United States:

N-Series Nonwoven Geotextiles: 135N, 140NL, 140NC, 140N, 170N, 180N, 1100N, 1120N, 1160N

S-Series Nonwoven Geotextiles: S600, S800, S1000, S1200, S1600

Paving Products: MPV, FG, FGC, MTK, 1450BB

Filterweave Geotextiles: FW300, FW402, FW403, FW500, FF101

G-Series: G100N, G100W, G200N

HP-Series Geotextiles: HP270, HP565, HP665, HP770, Miramesh

RSi Series Geotextiles: RS380i, RS580i

HS-Series Geotextiles: HS400, HS600, HS800, HS1150, HS1715

Miragrid XT Geogrids: 2XT, 3XT, 5XT, 7XT, 8XT, 10XT, 20XT, 22XT, 24XT

BXG Geogrids: BXG10, BXG11, BXG12

These products meet the requirements to be classified as a "Domestic Construction Material" under Section 52.225-9 Buy American Act – Construction Materials.

Sincerely,

A handwritten signature in cursive script that reads "Teri Krock".

Teri Krock
Senior Product Manager

TenCate Geosynthetics North America
365 South Holland Drive, Pendergrass, GA 30567 (706) 693-2226 Fax: (706) 693-4400

TENCATE

MIRAFI 1120N Certification

TenCate Geosynthetics Americas

Page: 1

ATTN: ERIC MAROLF
AMES CONSTRUCTION, INC.
P.O. BOX 163
VICTOR, COLORADO 80860-0163

Project: 090601-400
Proj Name: BALL MILL FILL EARTHWORK
Contractor: AMES CONSTRUCTION, INC.
QTY: 3 ROLLS (SEE ATTACHED)

This is to certify that Mirafi® 1120N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 1120N geotextile is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

| Mechanical Properties | Test Code | Test Method | Minimum Average Roll Value | | | |
|-------------------------------|-----------|-------------|----------------------------|---------|------|----------|
| GRAB TENSILE STRENGTH (MD) | GRABMD | ASTM D4632 | 300 | LBS | 1335 | N |
| GRAB TENSILE STRENGTH (CD) | GRABCD | ASTM D4632 | 300 | LBS | 1335 | N |
| ELONGATION (MD) | ELMD | ASTM D4632 | 50 | % | | |
| ELONGATION (CD) | ELCD | ASTM D4632 | 50 | % | | |
| TEAR STRENGTH (MD) | TTMD | ASTM D4533 | 115 | LBS | 512 | N |
| TEAR STRENGTH (CD) | TTCD | ASTM D4533 | 115 | LBS | 512 | N |
| CBR PUNCTURE | CBR | ASTM D6241 | 800 | LBS | 3560 | N |
| APPARENT OPENING SIZE - SIEVE | AOS | ASTM D4751 | 100 | # | | |
| APPARENT OPENING SIZE - MM | AOS2 | ASTM D4751 | .15 | MM | | |
| PERMITTIVITY | PTVY | ASTM D4491 | .80 | SEC-1 | | |
| WATER FLOW RATE | FLOW | ASTM D4491 | 65 | GPM/FT2 | 2648 | L/MIN/M2 |
| UV RESISTANCE @ 500 HOURS | UV | ASTM D4355 | 70 | % | | |

* Customer requested specification.

Certification reflects test results at time of manufacturing and shipment. TenCate Geosynthetics is not responsible for environment or other factors which could alter the physical properties.

ASTM D 4751, AOS is a Maximum Opening Diameter Value

ASTM D4491 - Tested according to Constant Head procedure.

{ I hereby certify under penalty of perjury that the material listed in this }
{ Certificate of Compliance represents 1,500 SY (quantity) of pay item }
{ Pay Item for installation on project: _____ }
{ Ball Mill Fill Earthwork, Number: 090601-400 }
{ _____ }
{ Contract Supplier : Bowman Construction Supply }
{ Date: 2/7/12 Balman }
{ _____ }

* * * END OF REPORT * * *

This February 07, 2012



Chris Whitfield, Quality Manager CERT#: 1004459

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 TenCate. TenCate warrants our products and services to be free from defects in material and workmanship when delivered to TenCate's customers and that our products meet our published specifications. Actual test data supplied is for the full width of the tested master roll.

American Association of Laboratory Accreditation Certificate Number: 1291.01 Accreditation #: GAI-LAP-25-1997

© 2012 TenCate Geosynthetics Americas

365 South Holland Dr.
Pendergrass, GA 30567

Tel 706 693 2226
Tel 888 795 0808

Fax 706 693 2122
www.tencate.com





TENCATE GEOSYNTHETICS
North America

Mirafi® Geotextile Testing Certification

Attn: Eric Marolf
Ames Construction, Inc.
P.O. Box 163
Victor, Colorado 80860-0163

Project: Ball Mill Fill Earthwork
Project#: 090601-400
Roll#: 921576982,921577001,921577018
Lot# 12951B

This is to certify that the Mirafi 1120N Geotextile stated herein, tested at the following values:

| Style Mirafi 1120N | Grab Tensile MD | Elongation MD | Grab Tensile CD | Elongation CD | Trap Tear MD | Trap Tear CD | Puncture | Burst | Flow Rate | Permittivity | AOS | Production & Test Date |
|-----------------------|-----------------------|------------------|-----------------------|------------------|-----------------|-----------------|---------------|---------------|---------------|---------------|-----------------|------------------------------|
| Roll Number | ASTM D4632 | ASTM D4632 | ASTM D4632 | ASTM D4632 | ASTM D4533 | ASTM D4533 | ASTM D4833 | ASTM D3786 | ASTM D4491 | ASTM D4491 | ASTM D4751 | |
| | lbs | % | lbs | lbs | lbs | lbs | lbs | psi | gal/min/sf | sec-1 | US Std Sieve | |
| 921576982 | 314 | 64 | 303 | 85 | 121 | 117 | 154 | 450 | 94 | 1.28 | 100 | 12/14/11 |
| 921577001 | 314 | 64 | 303 | 85 | 121 | 117 | 154 | 450 | 94 | 1.28 | 100 | 12/15/11 |
| 921577018 | 320 | 64 | 346 | 83 | 168 | 120 | 193 | 510 | 94 | 1.28 | 100 | 12/15/11 |

I hereby certify under penalty of perjury that the material listed in this
Certified Test Report represents 1500 sy_(quantity) of pay item

Pay Item for Installation on Project: Ball Mill Fill Earthwork

Project Number: 090601-400

Bolton L. H.
Contract Supplier - Bowman Construction Supply

2/7/12
Date

**MIRAFI 1120N Certification**

Attn: Eric Marolf
 Ames Construction, Inc
 P.O. Box 163
 Victor, Colorado 80860-0163

Proj Name: BALL MILL FILL EARTHWORK

ROLL: 921577001, 921576982 AND 921577018

This is to certify that Mirafi® 1120N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 1120N geotextile is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

| Mechanical Properties | Test Code | Test Method | Minimum Average Roll Value | | | |
|-------------------------------|-----------|-------------|----------------------------|---------|------|----------|
| GRAB TENSILE STRENGTH (MD) | GRABMD | ASTM D4632 | 300 | LBS | 1335 | N |
| GRAB TENSILE STRENGTH (CD) | GRABCD | ASTM D4632 | 300 | LBS | 1335 | N |
| ELONGATION (MD) | ELMD | ASTM D4632 | 50 | % | | |
| ELONGATION (CD) | ELCD | ASTM D4632 | 50 | % | | |
| TEAR STRENGTH (MD) | TTMD | ASTM D4533 | 115 | LBS | 512 | N |
| TEAR STRENGTH (CD) | TTCD | ASTM D4533 | 115 | LBS | 512 | N |
| CBR PUNCTURE | CBR | ASTM D6241 | 800 | LBS | 3560 | N |
| APPARENT OPENING SIZE - SIEVE | AOS | ASTM D4751 | 100 | # | | |
| APPARENT OPENING SIZE - MM | AOS2 | ASTM D4751 | .15 | MM | | |
| PERMITTIVITY | PTVY | ASTM D4491 | .80 | SEC-1 | | |
| WATER FLOW RATE | FLOW | ASTM D4491 | 65 | GPM/FT2 | 2648 | L/MIN/M2 |
| UV RESISTANCE @ 500 HOURS | UV | ASTM D4355 | 70 | % | | |

| Physical Properties | Test Code | Test Method | Typical Value | | | |
|---------------------|-----------|-------------|---------------|--------|-------|------|
| MASS/UNIT WEIGHT | WEIGHT | ASTM D5261 | 12.2 | OZ/YD2 | 413.6 | G/M2 |

* Customer requested specification.

Certification reflects test results at time of manufacturing and shipment. TenCate Geosynthetics is not responsible for environment or other factors which could alter the physical properties.

ASTM D 4751, AOS is a Maximum Opening Diameter Value

ASTM D4491 - Tested according to Constant Head procedure.

{ I hereby certify under penalty of perjury that the material listed in this }
 { Certificate of Compliance represents 1500 sy (quantity) of pay item }
 { Pay Item for installation on project: }
 { Ball Mill Fill Earthwork, Number: 090601-400 }
 { }
 { Contract Supplier : Bowman Construction Supply }
 { Date: 2/13/12 }
 { Bowman }

* * * END OF REPORT * * *

This February 13, 2012

Chris Whitfield

Chris Whitfield, Quality Manager CERT#: 1004504

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 TenCate. TenCate warrants our products and services to be free from defects in material and workmanship when delivered to TenCate's customers and that our products meet our published specifications. Actual test data supplied is for the full width of the tested master roll.

American Association of Laboratory Accreditation Certificate Number: 1291.01 Accreditation #: GAI-LAP-25-1997

© 2012 TenCate Geosynthetics Americas

365 South Holland Dr.
 Pendergrass, GA 30567

Tel 706 693 2226
 Tel 888 795 0808

Fax 706 693 2122
 www.tencate.com

