



## PRI Construction Materials Technologies LLC

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### Laboratory Test Report

**Report for:** CJI Group LTD  
4759 Hammermill Rd.  
Tucker, GA 30084

**Product Names:** 100 GSM CJI Felt

**Project No.:** 1846T0004

**Dates Tested:** May 15, 2024 – June 11, 2024

**Test Methods:** ASTM D8257/D8257M-20  
TAS 110-2000

**Results Summary:** Compliant: ASTM D8257 Table 1 - Requirements for Polymeric Roof Underlayments and TAS 110-2000 including 90d Allowable Outdoor Exposure

**Purpose:** Evaluate the identified product(s) for compliance with the physical requirements prescribed in **ASTM D8257: Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing**.

The product tested is a mechanically attached synthetic roof underlayment composed of multiple layers.

**Test Methods:** Testing was conducted in compliance with ASTM D8257/D8257M - 20: *Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing*. Test methods referenced or utilized include ASTM D146/D146M: *Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing*, ASTM D228/D228M: *Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing* D751 *Test Methods for Coated Fabrics*, ASTM D1204: *Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature*, ASTM D4533/D4533M: *Test Method for Trapezoid Tearing Strength of Geotextiles*, ASTM D4798/D4798M: *Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)*, ASTM D4869/D4869M: *Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing*, ASTM D5035: *Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)*, ASTM E96/E96M: *Test Methods for Water Vapor Transmission of Materials*, ASTM F1667 *Specification for Driven Fasteners - Nails, Spikes, and Staples*, ASTM G151: *Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources*, ASTM G155: *Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*.

**Sampling:** The following materials were received via common carrier by PRI.

| <u>Product</u>  | <u>Source</u> | <u>Date</u>   | <u>Sampling</u> |
|-----------------|---------------|---------------|-----------------|
| 100GSM CJI Felt | China         | Jun. 24, 2024 | CJI             |

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**Test Results:**

| Property                                                                                                                                                               | Test Method                                          | Result |      |      |         |      |      |         | Requirement                                                                                                     |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------|------|------|---------|------|------|---------|-----------------------------------------------------------------------------------------------------------------|------|
| Physical Requirements                                                                                                                                                  |                                                      |        |      |      |         |      |      |         |                                                                                                                 |      |
| Unrolling, (Pass/Fail)<br>10in x 18in specimens;<br>Cond. 24h @ 70±4°F & 50±5%RH;<br>Expose 24h at temp;<br>Unroll in 4-6s;                                            | ASTM D8257<br>Section 7.2                            | 1      | 2    | 3    | 4       |      |      |         | Pass =<br>No visible<br>cracking, tearing<br>or delamination of<br>underlayment                                 |      |
|                                                                                                                                                                        | Temp=32°F                                            | Pass   | Pass | Pass | Pass    |      |      |         | Pass                                                                                                            |      |
|                                                                                                                                                                        | Temp=140°F                                           | Pass   | Pass | Pass | Pass    |      |      |         | Pass                                                                                                            |      |
| Pliability, (Pass/Fail)<br>1in x 8in specimens;<br>Conditioned for 24h @ 14±4°F;<br>Bend 90° in 2s over 1/8" radius @ 14±4°F                                           | ASTM D8257<br>Section 7.3                            | 1      | 2    | 3    | 4       | 5    |      |         | Pass =<br>No visible cracking<br>or delamination of<br>underlayment                                             |      |
|                                                                                                                                                                        | As Received                                          | MD     | Pass | Pass | Pass    | Pass | Pass |         | Pass                                                                                                            |      |
|                                                                                                                                                                        |                                                      | CMD    | Pass | Pass | Pass    | Pass | Pass |         | Pass                                                                                                            |      |
|                                                                                                                                                                        | After Accelerated Weathering                         | MD     | Pass | Pass | Pass    | Pass | Pass |         | Pass                                                                                                            |      |
|                                                                                                                                                                        |                                                      | CMD    | Pass | Pass | Pass    | Pass | Pass |         | Pass                                                                                                            |      |
| Moisture Vapor Permeance, (Perms)<br>3 specimens minimum; 3.5in Ø;<br>Weathering side to ↑ Vapor<br>pressure;<br>Test @ 73±4°F & 50±5%RH                               | ASTM D8257<br>Section 7.4<br>ASTM E96<br>Procedure B | 1      | 2    | 3    |         |      | Avg. | St.Dev. |                                                                                                                 |      |
|                                                                                                                                                                        |                                                      | 0.09   | 0.07 | 0.09 |         |      | 0.08 | 0.01    | Report                                                                                                          |      |
| Liquid Water Transmission, (Pass/Fail)<br>14° slope;<br>Cond. 24h @ 70-85°F & 30-55%RH;<br>40-42 gal/h shower exposure for 4h;                                         | ASTM D8257<br>Section 7.5<br>ASTM D4869              | 1      | 2    |      |         |      |      |         | Pass =<br>No wetness on<br>either specimen<br>underside or top<br>of plywood and no<br>visible<br>deterioration |      |
|                                                                                                                                                                        |                                                      | Pass   | Pass |      |         |      |      |         | Pass                                                                                                            |      |
| Linear Dimensional Change, (%)<br>10" x 10" specimens;<br>Cond. 40h @ 73±4°F & 50±10%RH;<br>Exposed for 24h @ 185±2°F;<br>Cond. 1h @ 73±4°F & 50±10%RH                 | ASTM D8257<br>Section 7.6 /<br>ASTM D1204            | 1      | 2    | Avg. | St.Dev. |      |      |         |                                                                                                                 |      |
|                                                                                                                                                                        | MD                                                   | -2.1   | -2.4 | -2.3 | 0.2     |      |      |         | -2.5 to +1                                                                                                      |      |
|                                                                                                                                                                        | CMD                                                  | -1.7   | -2.0 | -1.9 | 0.2     |      |      |         | -2.5 to +1                                                                                                      |      |
| Tensile Strength (lbf/in)<br>Type IC-E; 1in x 6in specimens;<br>Cond. 2h @ 73±4°F; Cut Strip Method;<br>Test @ 73±4°F & 50±5%RH;<br>Gage length = 3in; Rate = 12in/min | ASTM D8257<br>Section 7.7 /<br>ASTM D5035            | 1      | 2    | 3    | 4       | 5    | Avg. | St.Dev. |                                                                                                                 |      |
|                                                                                                                                                                        | As Received                                          | MD     | 100  | 105  | 101     | 106  | 102  | 103     | 3                                                                                                               | ≥ 20 |
|                                                                                                                                                                        |                                                      | CMD    | 91   | 93   | 92      | 95   | 96   | 93      | 2                                                                                                               | ≥ 20 |
|                                                                                                                                                                        | After Thermal Cycling                                | MD     | 104  | 108  | 105     | 103  | 104  | 105     | 1.8                                                                                                             | ≥ 20 |
|                                                                                                                                                                        |                                                      | CMD    | 95   | 86   | 97      | 89   | 88   | 91      | 4.6                                                                                                             | ≥ 20 |
|                                                                                                                                                                        | After Accelerated Aging                              | MD     | 108  | 111  | 108     | 110  | 104  | 108     | 2.5                                                                                                             | ≥ 20 |
|                                                                                                                                                                        |                                                      | CMD    | 98   | 96   | 100     | 99   | 99   | 98      | 1.3                                                                                                             | ≥ 20 |
| Continued on following page                                                                                                                                            |                                                      |        |      |      |         |      |      |         |                                                                                                                 |      |

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| Property                                                                                                                                                                    | Test Method                                                | Result |      |      |      |      |      |         |    |    |    |      |         | Requirement                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------|------|------|------|------|------|---------|----|----|----|------|---------|---------------------------------------------------------------------------------------------------------------------|
| Tearing Strength (lbf/in)<br>3in x 8in specimens; Dry condition;<br>Cond. 24h @ 73±4°F;<br>Test @ 73±4°F & 50±5%RH;<br>Gage length = 1in; Rate = 12in/min                   | ASTM D8257<br>Section 7.8 /<br>ASTM D4533                  | 1      | 2    | 3    | 4    | 5    | Avg. | St.Dev. |    |    |    |      |         |                                                                                                                     |
| As Received                                                                                                                                                                 | MD                                                         | 33     | 55   | 39   | 36   | 41   | 41   | 8       |    |    |    |      | ≥ 15    |                                                                                                                     |
|                                                                                                                                                                             | CMD                                                        | 38     | 38   | 38   | 36   | 33   | 36   | 2       |    |    |    |      | ≥ 15    |                                                                                                                     |
| After Thermal Cycling                                                                                                                                                       | MD                                                         | 42     | 42   | 36   | 41   | 36   | 39   | 3       |    |    |    |      | ≥ 15    |                                                                                                                     |
|                                                                                                                                                                             | CMD                                                        | 37     | 32   | 34   | 36   | 32   | 34   | 2       |    |    |    |      | ≥ 15    |                                                                                                                     |
| After Accelerated Aging                                                                                                                                                     | MD                                                         | 42     | 43   | 52   | 48   | 44   | 46   | 4       |    |    |    |      | ≥ 15    |                                                                                                                     |
|                                                                                                                                                                             | CMD                                                        | 48     | 44   | 32   | 48   | 38   | 42   | 7       |    |    |    |      | ≥ 15    |                                                                                                                     |
| Fastener Pull- Through Resistance (lbf)<br>4in x 4in specimens;<br>Cond. & Test @ 73±4°F & 50±5%RH;<br>1-1/2" long Galv. Roofing Nail;<br>Gage length = 1in; Rate = 4in/min | ASTM D8257<br>Section 7.9 /<br>ASTM D228                   | 1      | 2    | 3    | 4    | 5    | 6    | 7       | 8  | 9  | 10 | Avg. | St.Dev. |                                                                                                                     |
| As Received                                                                                                                                                                 |                                                            | 61     | 48   | 50   | 56   | 52   | 58   | 50      | 63 | 54 | 57 | 55   | 5       | ≥ 25                                                                                                                |
| After Thermal Cycling                                                                                                                                                       |                                                            | 61     | 59   | 55   | 58   | 50   | 56   | 63      | 56 | 52 | 58 | 57   | 4       | ≥ 25                                                                                                                |
| After Accelerated Aging                                                                                                                                                     |                                                            | 61     | 57   | 57   | 66   | 64   | 62   | 70      | 63 | 59 | 60 | 62   | 4       | ≥ 25                                                                                                                |
| Hydrostatic Resistance [Pass/Fail]<br>3in x 3in specimens;<br>Test @ 73±4°F & 50±5%RH;<br>Exposed to 1psi for 5min;<br>Mullen type hydrostatic tester                       | ASTM D8257<br>Section 7.10 /<br>ASTM D751<br>Procedure A-2 | 1      | 2    | 3    | 4    | 5    |      |         |    |    |    |      |         | Pass =<br>No water shall<br>pass through any<br>specimen                                                            |
| As Received                                                                                                                                                                 |                                                            | Pass   | Pass | Pass | Pass | Pass |      |         |    |    |    |      |         | Pass                                                                                                                |
| After Thermal Cycling                                                                                                                                                       |                                                            | Pass   | Pass | Pass | Pass | Pass |      |         |    |    |    |      |         | Pass                                                                                                                |
| After Accelerated Aging                                                                                                                                                     |                                                            | Pass   | Pass | Pass | Pass | Pass |      |         |    |    |    |      |         | Pass                                                                                                                |
| Thermal Cycling [Pass/Fail]<br>8h @ 120±2°F followed by;<br>16h @ -40±2°F                                                                                                   | ASTM D8257<br>Section 7.11                                 |        |      |      |      |      |      |         |    |    |    |      |         | Pass =<br>No visible damage<br>such as peeling,<br>chipping, crazing,<br>splitting, cracking,<br>flaking or pitting |
|                                                                                                                                                                             |                                                            | Pass   |      |      |      |      |      |         |    |    |    |      |         | Pass                                                                                                                |
| Accelerated Weathering [Pass/Fail]<br>Exposure 500h;<br>ASTM D4798 Cycle A-1                                                                                                | ASTM D8257<br>Section 7.12 /<br>ASTM D4798<br>Cycle A-1    |        |      |      |      |      |      |         |    |    |    |      |         | Pass =<br>No visible damage<br>such as peeling,<br>chipping, crazing,<br>splitting, cracking,<br>flaking or pitting |
|                                                                                                                                                                             |                                                            | Pass   |      |      |      |      |      |         |    |    |    |      |         | Pass                                                                                                                |
| Other                                                                                                                                                                       |                                                            |        |      |      |      |      |      |         |    |    |    |      |         |                                                                                                                     |
| Net Mass (GSM)                                                                                                                                                              | ASTM D228                                                  | 101.5  |      |      |      |      |      |         |    |    |    |      |         | Report                                                                                                              |

Notes: None

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**Table 2 – Results for 90d of Allowable Outdoor Exposure (TAS 110 – 500h, ASTM D4798. Cycle A-1)**

| Property                                                                                                                                                               | Test Method                               | Result |      |      |      |      |      |         | Requirement                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------|------|------|------|------|------|---------|---------------------------------------------------------------------|
| Extended exposure - 90d of Allowable Outdoor Exposure (TAS 110 – 500h, ASTM D4798. Cycle A-1)                                                                          |                                           |        |      |      |      |      |      |         |                                                                     |
| Pliability, (Pass/Fail)<br>1in x 8in specimens;<br>Conditioned for 24h @ 14±4°F;<br>Bend 90° in 2s over 1/8" radius @14±4°F                                            | ASTM D8257<br>Section 7.3                 | 1      | 2    | 3    | 4    | 5    |      |         | Pass =<br>No visible cracking<br>or delamination of<br>underlayment |
| After Laboratory Accelerated Weathering                                                                                                                                | MD                                        | Pass   | Pass | Pass | Pass | Pass |      |         | Pass                                                                |
|                                                                                                                                                                        | CMD                                       | Pass   | Pass | Pass | Pass | Pass |      |         | Pass                                                                |
| Tensile Strength (lbf/in)<br>Type IC-E; 1in x 6in specimens;<br>Cond. 2h @ 73±4°F; Cut Strip Method;<br>Test @ 73±4°F & 50±5%RH;<br>Gage length = 3in; Rate = 12in/min | ASTM D8257<br>Section 7.7 /<br>ASTM D5035 | 1      | 2    | 3    | 4    | 5    | Avg. | St.Dev. |                                                                     |
| After Laboratory Accelerated Weathering                                                                                                                                | MD                                        | 108    | 111  | 108  | 110  | 104  | 108  | 2.5     | ≥ 20                                                                |
|                                                                                                                                                                        | CMD                                       | 98     | 96   | 100  | 99   | 99   | 98   | 1.3     | ≥ 20                                                                |
| Elongation (lbf/in)<br>Type IC-E; 1in x 6in specimens;<br>Cond. 2h @ 73±4°F; Cut Strip Method;<br>Test @ 73±4°F & 50±5%RH;<br>Gage length = 3in; Rate = 12in/min       | ASTM D8257<br>Section 7.7 /<br>ASTM D5035 | 1      | 2    | 3    | 4    | 5    | Avg. | St.Dev. |                                                                     |
| As Received                                                                                                                                                            | MD                                        | 11     | 11   | 12   | 11   | 12   | 11   | 1       | Report                                                              |
|                                                                                                                                                                        | CMD                                       | 10     | 12   | 11   | 12   | 13   | 12   | 1       | Report                                                              |
| After Laboratory Accelerated Weathering                                                                                                                                | MD                                        | 11     | 11   | 11   | 12   | 10   | 11   | 1       | Report                                                              |
|                                                                                                                                                                        | CMD                                       | 11     | 12   | 10   | 12   | 12   | 11   | 1       | Report                                                              |

Notes: None

**Statement of Compliance:**

The product described herein complies with the physical requirements prescribed in **ASTM D8257: Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing**. The laboratory test results presented in this report are representative of the specimens supplied.

**Extended Exposure Limitation:**

The product tested has demonstrated 90 days of allowable exposure as prescribed in TAS 110-2000.

Signed:

  
Zachary Priest, P.E.  
Director

Signed:

  
Bill Bennett  
Project manager

Date:

7/11/2024

Date:

7/11/2024

**Report Issue History:**

| Issue #  | Date      | Pages | Revision Description (if applicable) |
|----------|-----------|-------|--------------------------------------|
| Original | 7/11/2024 | 4     | NA                                   |

**End of Report**

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