

## TECHNICAL BULLETIN

### DOUBLE-COATED FOAM TAPE SYSTEM

|                              |  |  |               |
|------------------------------|--|--|---------------|
| PRODUCT:                     | <b>EXTREME BOND TAPE – EBT Series</b>  |  |               |
| PRIMARY USE:                 | Provide long-term indoor and outdoor bonding to glass, ceramics, primed, painted, aluminum and plastic surfaces without silane / isopropanol pre-wash. The double-coated tape series was engineered specifically for resistance to air, water, detergents, moisture, light and dust penetration. Foam fills any irregularities and functionally provides cushioning, absorbs vibration and shock, and allows for expansion and contraction due to temperature variations. See associated sheets for specific testing and performance data. |  |               |
| DESCRIPTION:                 | A cross linked polyethylene foam coated on both sides with a high performance acrylic adhesive system developed specifically for extreme environmental exposures that does not require silane / isopropanol pre-treatment for adhesion to glass or ceramic surfaces.   |  |               |
| LINER:                       | 74lb bleached paper liner  |  |               |
| TYPICAL PHYSICAL PROPERTIES: | Thickness  | EBTLG-190: Gray, 1/32" thick, polyethylene foam  | 0.03" nominal |
|                              |  | EBTCH-190: Gray, 1/32" thick, polyethylene foam  | 0.03" nominal |
|                              |  | EBTB-190: Black, 1/32" thick, polyethylene foam  | 0.03" nominal |
|                              |  | EBTB-290: Black 1/16" thick, polyethylene foam   | 0.06" nominal |
|                              |  | Liner (nominal)  | 5.5 mils      |
|                              | Peel Adhesion  | See Attached Data<br><br>NOTE: Peel tests are performed as per PSTC #101, which states one minute maximum dwell time. In general, for acrylic adhesives, longer residence time yields much higher peel values. |               |
|                              | Shear Adhesion   | See Attached Data  |               |

| <u>Tests Performed</u> | <u>Condition</u>    | <u>Time</u>   | <u>Materials</u> |
|------------------------|---------------------|---------------|------------------|
| Cleavage               | Dry                 | Initial       | Vinyl            |
| Peels                  | Water Immersion     | 1 Day         | Primed Wood      |
| Shear                  | Detergent Immersion | 7 Days        | Aluminum         |
| Dynamic Shear          | Heat Exposure       | 10 Days       |                  |
| Aging                  | UV                  | 3 Days        |                  |
| Fogging                |                     | 5 Days        |                  |
|                        |                     | Failure Point |                  |

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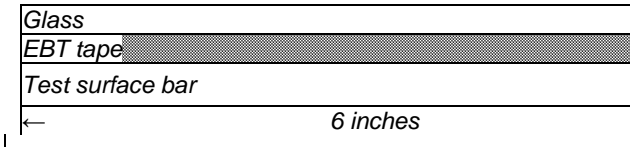
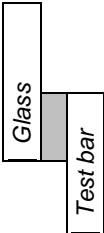
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### EXTREME BOND TAPE – EBT Series

|                         |  |
|-------------------------|--|
| <p>TESTING METHODS:</p> | <p><b>Peel Adhesion:</b> PSTC #103 modified; backed with 1-mil PET.</p> <p><b>Cleavage Test:</b> Figure 1 illustrates the setup of the cleavage test. A 6-inch length of test tape is sandwiched between the glass and test surface bar. Bars are an inch longer than the tape so there is room to hang weight. 1000-gram weights are used for 15-minute dwelled samples and 2000-gram weights are used for 72-hour dwelled samples. Test assemblies are also placed in water or a Windex® solution for 72 hours after they are dwelled at room temperature for 72 hours. 500-gram weights are used for these samples. <i>Figure 1</i></p>  <p><b>Lap Shear Test:</b> Test specimens are setup in accordance with Figure 2. The test surface bar is assembled with a 1"×1" piece of the test tape and dwelled at room temperature for 15 or 72 hours. In the dynamic lap shear test, the glass and test bar are separated in reverse directions with a constant 2 inch/minute speed and the maximum force that is required to separate the sample is recorded. In the static lap shear test, a 1000 gram weight is hung on the test bar and the time that the test bar fails is recorded. <i>Figure 2</i></p>  <p><b>Static Shear:</b> PSTC#107 modified; at 158°F.</p> <p><b>Fogging tests:</b> Seal 60 in<sup>2</sup> of EBT tape in a test tube, expose the tape to a constant UV source for 21 days at 180°F. Evaluate tape discoloration and residue at 3, 7, 14 and 21 days.</p> <p><b>Xenon Weatherometer Exposure</b> Per ASTM G26-96: Expose test bar/tape/glass assembly to intense xenon arc weatherometer with water spray for 30 days. Evaluate adhesion at 7-, 14-, and 30-days exposure.</p> |
|-------------------------|--|

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#### TEST RESULTS

##### Peels: Dry Peel 180°

|                 | Al                   | Glass                | Primed Pine          | Vinyl                |
|-----------------|----------------------|----------------------|----------------------|----------------------|
| RT X 15 min.    | 3.8 pli              | >6.5 pli (foam tear) | 1.6 pli              | 3.0 pli              |
| RT X 72 hrs.    | >6.5 pli (foam tear) | >6.5 pli (foam tear) | >6.5 pli (foam tear) | >6.5 pli (foam tear) |
| 120°F X 72 hrs. | >6.5 pli (foam tear) | >6.5 pli (foam tear) | >6.5 pli (foam tear) | >6.5 pli (foam tear) |

##### Peels: Peel Retention To Glass

|            | Days in H <sub>2</sub> O | Immed. | 1 day | 3 day | 5 day | 7 day | 10 day |
|------------|--------------------------|--------|-------|-------|-------|-------|--------|
| EBT TAPE   | Without Silane           | 12+    | 12+   | 12+   | 12+   | 12+   | 12+    |
| Competitor | With Wash                | 12+    | 7.3   | 0.2   | -     | -     | -      |
|            | Without Wash             |        | 10+   | 10+   | 10+   | 5.3   | 4.2    |

| Cleavage Tests<br>(Test Condition) | Al       | Raw Pine | Treated Wood | Primed Pine |
|------------------------------------|----------|----------|--------------|-------------|
| Dry                                | 10+ days | 10+ days | 10+ days     | 10+ days    |
| 72 hrs water immersion             | 2+ days  | 2+ days  | 10+ days     | 10+ days    |
| 72 hrs windex immersion            | 10+ days | 10+ days | 10+ days     | 10+ days    |

**Lap Shears: Dynamic Lap Shear, Of Aluminum And Pine To Glass**, max load (lbs) at failure, 1" X 1" overlap at 2 ipm separation speed, dwelled 15 min or 72 hrs prior to test.

|                 | Aluminum | Primed Wood |
|-----------------|----------|-------------|
| Dwelled 15 min. | 65 lbs.  | 74 lbs.     |
| Dwelled 72 hrs. | 73 lbs.  | 79 lbs.     |

**Static Lap Shear, Of Aluminum, Pine, Treated Pine, and Primed Pine To Glass**, Days to failure, 1" X 1" X 1 kg loading, samples are dwelled 15 min or 72 hours prior to test

|                | Aluminum | Primed Wood | Treated Pine | Primed Pine |
|----------------|----------|-------------|--------------|-------------|
| Dwelled 15 min | 3.5 days | 5.8 days    | 2.1 days     | 4.9 days    |
| Dwelled 72 hrs | 7+ days  | 7+ days     | 7+ days      | 7+ days     |

| Static Shear - Test A: Creep at 158°F<br>Dwelled 10 days at RT 1" X 1" between glass and aluminum | Static Shear - Test B: Holding power at 150°F<br>exposed side/liner side, No dwell, 1" X 1" X 1 kg |
|---|--|
| 128.5 hrs   | 14+/14+ days   |

| Fogging Test (Exposure Period) | 3 days             | 7 days             | 14 days            | 21 days            | Residue | Color Change | Final Evaluation |
|--------------------------------|--------------------|--------------------|--------------------|--------------------|---------|--------------|------------------|
| EBT Tape                       | No visible deposit | No visible deposit | No visible deposit | No visible deposit | None    | None         | Pass             |

| Weatherometer Exposure<br>(exposure period) | 7 days                                     | 14 Days                                   | 30 days |
|---|--|---|---------|
| EBT Tape                                    | No adhesion loss;<br>Test bars stay intact | No adhesion loss;<br>Test bar stay intact |         |

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### EXTREME BOND TAPE – EBT SERIES

|                      |  |
|----------------------|--|
| PRODUCT FEATURES:    | <ul style="list-style-type: none"><li>. Excellent water and detergent resistance.</li><li>. No silane / isopropyl pre-wash required.</li><li>. Acrylic adhesive system developed for extreme environmental applications.</li><li>. Excellent UV resistance.</li><li>. Excellent quick stick.</li><li>. Moderate shear strength.</li><li>. Bonds well to irregular surfaces.</li></ul>  |
| SERVICE TEMPERATURE: | <p>-30° F to 220° F.</p> <p>NOTE: This information is provided as a means to help characterize the adhesive's temperature resistance. Note that this data is based on limited testing and under no load. The practical service temperature of this or any adhesive system is dependent on many variables including the substrates being bonded, environmental conditions, and the loading and method of application. The purchaser is responsible for determining the suitability of this or any product for their particular purpose and process. The recommended application temperature is 68°F to 100°F.</p> |
| NOTES:               | Surfaces to be bonded should be dry, clean and free from grease and oil. Products should not be laminated to any material that contains migrating plasticizer.   |
| SHELF LIFE:          | One year from date of shipment when stored under cool, dry conditions.   |

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