3M™ Solar Acrylic Foam Tape 4155

Product Description

3M™ Solar Acrylic Foam Tape 4155 features a modified acrylic adhesive on both sides of a very conformable, dark grey acrylic foam carrier. It offers good adhesion on a broad range of substrates.

Key Benefits

- Pressure sensitive adhesive for quick application with immediate handling strength to speed assembly.
- Strength to replace liquid adhesives and mechanical fasteners in many applications.
- Neat application without the mess, ooze, and curing delay of liquid adhesives.
- Can typically tolerate differential movement in the shear plane up to 3 times its thickness.
- Bonds and seals simultaneously with durability to withstand vibration, impact, and weathering.
- Provides a clean, smooth appearance.

Slitting Tolerance

Standard slitting tolerance ±1/32 inch (±0.8 mm).

Core Size

Available on a 3 inch ID Core (76.2 mm).

UL Component Recognition

Tape 4155 is UL listed under UL 746C category Q0QW2, file number MH17478.

Typical Physical Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.062 (1.55)</td>
</tr>
<tr>
<td>Tolerance</td>
<td>± 10%</td>
</tr>
<tr>
<td>Adhesive Type</td>
<td>Modified Acrylic</td>
</tr>
<tr>
<td>Foam Type</td>
<td>Very Conformable Closed Cell</td>
</tr>
<tr>
<td>Density lb/ft³ (kg/m³)</td>
<td>37 (590)</td>
</tr>
<tr>
<td>Release Liner Thickness</td>
<td>0.005 (0.125)</td>
</tr>
<tr>
<td>Color</td>
<td>Red</td>
</tr>
</tbody>
</table>

Dynamic Adhesion Performance

- **90° Peel Adhesion**: Based on ASTM D-3330 – To stainless steel, room temperature, jaw speed 12 in/min (305 mm/min). Average force to remove is measured.
- Normal Tensile – ASTM D-897 – To aluminum, room temperature, 1 in² (6.45 cm²), jaw speed 2 in/min (50 mm/min.). Peak force to separate is measured.
- Dynamic Overlap Shear – ASTM D-1002 – To stainless steel, room temperature, 1 in² (6.45 cm²), jaw speed 0.5 in/min (12.7 mm/min.) Peak force to separate is measured.

Static Shear

- **Weight (grams)** that 1/2 square inch will hold for 10,000 minutes (7 days):
  - 72°F (22°C) 1000
  - 150°F (66°C) 500
  - 200°F (93°C) 500
  - 250°F (121°C) 250

Temperature Tolerance

- **Short Term (Minutes, Hours)**
  - °F (°C): 300 (149)
  - °C: 300 (149)
- **Long Term (Days, Weeks)**
  - °F (°C): 250 (121)

Note: All tapes should be thoroughly evaluated by the user under actual conditions with intended substrates to determine whether a specific tape is fit for a particular purpose and suitable for user’s method of application, especially if expected use involves extreme environmental conditions.

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Static Shear – ASTM D3654 – To stainless steel, tested at various temperatures and gram loadings.

1500 g/0.5 in² equals 6.6 lb/in²; 500 g/0.5 in² = 2.2 lb/in².

Short Term Temperature Tolerance – No change in room temperature dynamic shear properties following 4 hours conditioning at indicated temperature with 100 g/static load. (Represents minutes, hours in a process type temperature exposure).

Long Term Temperature Tolerance – Maximum temperature where tape supports at least 250 g load per 0.5 in² in static shear for 10,000 minutes. (Represents continuous exposure for days or weeks.)
Application Guidelines

Temperature, humidity, pressure and cleanliness can impact the adhesion characteristics.

- **Temperature:** As temperature increases, the initial adhesion will typically increase. Suggested application temperatures are 70°F to 100°F (21°C to 38°C). Minimum application temperature is 60°F (15°C).

- **Humidity:** The suggested humidity target for the application is below 90% R.H. SAF that has a paper liner should be kept and applied below 70% R.H. There is concern that bringing cold tape or substrates into a warm humid environment can also cause condensation, which impact adhesion.

- **Pressure:** Increasing pressure can improve the adhesive to surface contact, which can increase the adhesion. Suggested pressurization is 30 psi. Minimum suggested pressurization is 15 psi at bond interface.

- **Cleanliness:** The cleanliness of the surface can also impact adhesion. Typically a thorough cleaning with a 50:50 mixture of isopropyl alcohol and water is sufficient. The impact of these variables is very dependent on the specific substrate. Going outside of these ranges can have positive or negative impacts. Performance is dependent on the substrate.

See Application Techniques document for additional information.

Shelf Life

24 months from date of manufacture when stored at 40°F to 100°F (4°C to 38°C) and 0 to 95% relative humidity. The optimum storage conditions are 72°F (22°C) and 50% relative humidity.

Performance of tapes is not projected to change even after shelf life expires; however, 3M does suggest that 3M™ Solar Acrylic Foam Tapes are used prior to the shelf life date whenever possible.

Additional Typical Characteristics

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Conductivity – K-value</td>
<td>Unit Value</td>
</tr>
<tr>
<td>BTU/hr ft² °F (w/mK)</td>
<td>0.37 (0.05)</td>
</tr>
<tr>
<td>R-Value = thickness/K-value (When units of K-value are BTU-in/hr ft² °F and thickness is given in inches.)</td>
<td></td>
</tr>
<tr>
<td>Resistivity (ASTM D257)</td>
<td>Unit Value</td>
</tr>
<tr>
<td>Volume Resistivity (in ohm-cm)</td>
<td>2.5 x 10⁴</td>
</tr>
<tr>
<td>Surface Resistance (in ohms/square)</td>
<td>&gt;10¹⁶</td>
</tr>
</tbody>
</table>

For more information on our solar manufacturing product line, contact 3M Renewable Energy at 800-755-2654 or visit us at www.3M.com/solar.

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