SilGrip* PSA5080 Pressure Sensitive Adhesive

PSA5080 silicone pressure sensitive adhesive is a toluene solution of polysiloxane gum and resin. It is supplied at 60 percent silicone solids and may be further diluted with aromatic, aliphatic or chlorinated solvents. PSA5080 has been designed as a binding material for the manufacturing of mica tape, which is widely used as flame-retardant material in industries of electronic and architecture. And since PSA5080 possesses supreme adhesion strength, outstanding heat and electric resistance, it provides strong bond strength within mica sheet and between glass fiber cloth and mica sheet to give further structural reinforcement and insulation.

**Description**

Key Performance/Properties:

- Low viscosity to give good penetration through fabric or porous sheet.
- Provides excellent balance of peel strength, tack, cohesion strength.
- Fast cure to give good dryness and tenderness.
- Adjustable cure speed and hardness on site.
- Provides excellent heat and electric resistance.
- Maintains good shear and tack properties at wide temperature range.
- Resistance to moisture, weathering (ozone, sunlight), chemical (acids, alkalis, oils) and biological (fungus) attack.

**Typical Product Data:**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone Solid, %</td>
<td>~60</td>
</tr>
</tbody>
</table>

*SilGrip is a trademark of Momentive Performance Materials Inc.*
Typical properties are average data and are not to be used as or develop specifications.

**General Considerations for Use**

**Application & Bath Preparation**

PSA5080 silicone adhesive is supplied at a viscosity suitable for conventional tape coating equipment. If necessary, it may be thinned with toluene, xylene or other compatible solvents. The coating bath concentration should be adjusted based on the type of mica, glass cloth as well as on the application. For general purposes, a 13~15% solid content is recommended for single-side mica tape, while lower PSA concentration would be used for double-sided ones to give optimized performance. After the adhesive is applied to the substrate, it is exposed to a three-step process: lamination, solvent removal and curing.

**Lamination**

In this step, Mica sheet is applied on glass cloth that is saturated with PSA solution, most of which will be absorbed into mica sheet during this process. Bath concentration, viscosity, line speed and the distance between the coat head and oven would give great impact on this step as well as the final property of product. Depending on the type and thickness of both mica sheet and glass fiber cloth, each parameter should be optimized carefully in order to get required performance. For instance, bad adhesion strength or delaminating would be resulted with low solid content, low viscosity or/and long lamination period, while sticky surface is the common problem when the viscosity goes to high-level or/and line speed goes too fast.

**Solvent Removal**

To achieve optimum adhesive properties, it is essential to optimize the drying step of...
the process in order to assure that the solvent is removed from the adhesive film before the curing step of the process starts. Improper drying will result in residual solvent entrapment within the adhesive. If the adhesive is then exposed to temperatures higher than 93.5 °C (200 °F), decomposing peroxide catalyst can cause cross-linking reaction between solvent and adhesive through methyl groups on siloxane chains and on solvent molecules and adversely affect the properties of the adhesive. Typical temperature range for the drying step of the process is 83 °C (180 °F) to 90 °C (194 °F). A typical drying cycle is 2 minutes at 90 °C (194 °F).

**Curing Process**

In order to achieve desired high adhesion strength and heat resistance, once the solvent is removed from the adhesive film, the peroxide cure should be initiated by exposure to heat. A typical curing cycle is 2~3 minutes at 165 °C (329 °F). Longer exposure time and higher temperature, up to 204 °C (400 °F), can be used without adverse effects. The exact conditions required to achieve a complete cure will depend on oven length and efficiency, peroxide type and type of substrate used, and should be established during experimental trials on the machine.

**Catalysts**

High purity, 98% benzoyl peroxide in the quantity of 1 to 4% based on silicone solids, has been found to give the most consistent results in curing of silicone pressure sensitive adhesives. In applications requiring low temperature cure, 2,4-dichlorobenzoyl peroxide, which is activated at 132 °C (270 °F), can be used. It should be noted that 2,4-dichlorobenzoyl peroxide may generate polychlorinated biphenyls during the curing process. Please refer to Code of Federal Regulations, title 40, part 761 regarding incidental PCB byproducts if 2,4-dichlorobenzoyl peroxide is utilized. The peroxide should be dispersed in solvent before it is mixed with the adhesive. Thorough mixing of the peroxide and adhesive to achieve homogeneous dispersion is
essential
for consistency of finished product.

Typical Demonstration
The following example demonstrates a typical case for Mica tape production:

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Content</td>
<td>%</td>
<td>14</td>
</tr>
<tr>
<td>Bath Viscosity</td>
<td>Sec</td>
<td>18</td>
</tr>
<tr>
<td>BPO</td>
<td>%</td>
<td>1.5~3(solid)</td>
</tr>
<tr>
<td>Cure Temperature</td>
<td>°C</td>
<td>170~180</td>
</tr>
<tr>
<td>Line Speed</td>
<td>M/min</td>
<td>6</td>
</tr>
<tr>
<td>Silicone in Tape</td>
<td>%</td>
<td>9.88</td>
</tr>
<tr>
<td>Absorbed by Mica</td>
<td>%</td>
<td>8.95</td>
</tr>
</tbody>
</table>

Patent Status
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Product Safety, Handling and Storage
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