

Product Data Sheet



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Adhesives, Specialty Films & Seam Tape

Date: October 16, 2012
Product: **3231**

Version: 1

Product Description:

3231 is a heat activated mono layer adhesive film coated on a silicone release paper. 3231 is available in several different thicknesses.

Product Benefits:

- Low activation temperature.
- Excellent adhesion to various fabrics, leather, glass fiber, PU coated fabrics and most polar plastics including PVC, Polycarbonate, ABS and Polyurethane.
- Good heat resistance in flat areas.
- No surface tack at room temperature
- Can be die cut to different shapes or slit to required width

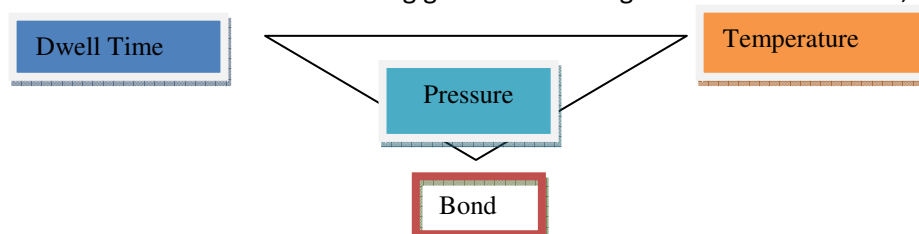
Composition: Ester based Polyurethane

Thermal & Physical Properties

Color: Translucent
Density: 29 gm/m² per 1 mil of thickness
Nominal Thickness: 1, 2, 3, 5 and 10 mil available
Substrate: Silicone Release Paper (87 gm/m², nominal thickness is 3 mil)
Hardness: 92A
Water Absorption: 0.25% Max
Softening Point: 75°C TMA Onset Temperature
Melt Flow Index: 11.0 dg/min *Condition: 175°C / 2.16 Kg Load*

Recommended Bonding Conditions:

3231 requires heat to bond. Heated press, heated roll or heated belt laminator can be used to activate the adhesive. There are three critical factors in achieving good bond strength between substrates, these are:



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The ideal bonding conditions (Temperature, dwell time and pressure) depends on exact substrates and type of equipment. Bemis recommends following conditions as a general guidelines to evaluate 3231 for an application.

Glue Line Temperature ¹ :	90 – 120°C
Dwell Time:	10 – 30 seconds
Pressure:	2.8 – 5.0 Bar

¹ Glue Line Temperature (GLT) refers to the temperature of the adhesive in the bonding process. Glue line temperature must be measured to receive accurate machine settings

Note: Recommended bonding conditions will vary between different machinery and fabrics. The recommended conditions stated are a starting point only. Optimal bonding conditions should be established by the factory for the specific application

Other Processing Techniques:

3231 has a polar chemistry; it can be activated using High Frequency – HF (Also known as Radio Frequency-RF) and Ultrasonic energy. Processing parameter for HF or Ultrasonic depend on equipment and substrates.

Bond Strength after Heat Sealing:

3231 is a crystalline polyurethane adhesive; its crystallization rate is rapid at room temperature. This product does not need much aging in room temperature to achieve its highest peel strength. Our testing indicates the adhesive should be fully crystallized and achieves its peel strength 30 minutes after bonding when stored at room temperature.

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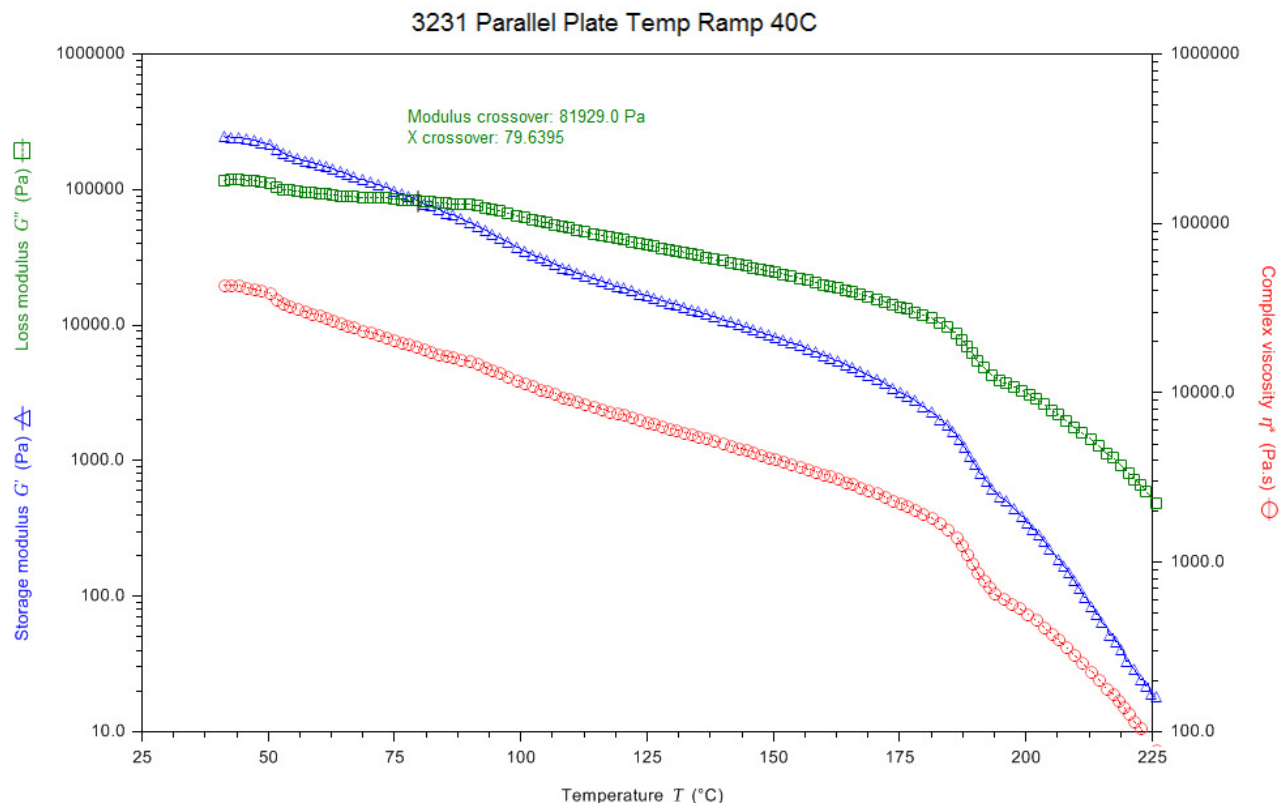
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Temperature vs. Viscosity curve:



The plot above plot shows results for Bemis 3231 tested using a TA Instruments AR2000EX rotational rheometer in dynamic parallel plate configuration. In a dynamic mechanical measurements, a sinusoidal strain is applied to the sample, and a resulting sinusoidal stress is collected. For viscoelastic materials, there is a phase lag between the stress and the strain due to viscoelastic dissipation. Mechanical properties such as modulus and viscosity are represented by elastic and viscous components, for example G' (elastic) and G'' (loss). The total complex modulus or viscosity is G^* or η^* . The test can be carried out as a function of temperature, test frequency, or strain. In this test of Bemis 3231, we have ramped the temperature at a rate of 5°C/minute while continuously collecting data. As would be expected, the elastic modulus and the viscosity decrease with increasing temperature. By convention, the temperature at which the elastic modulus and loss modulus cross is considered the solid-liquid transition for the material, in this case about 80°C. We would therefore expect for 3231 that a temperature greater than 80°C is required for appreciable flow to occur.

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