

STAYSTIK® 191

Silver Filled Electrically Conductive Paste

DESCRIPTION

These thermoplastic adhesive pastes are designed for use in a variety of electronic applications. These materials are characterized by their excellent bonding at low process temperatures. The properties of these adhesives make them exceptional for heatsink bonding to BGA as well as TAB bonding to PCB. The unique reworkability of this thermoplastic adhesive system offers many advantages in applications traditionally ill-suited to thermoset adhesives.

**Fully Polymerized Resin – No “Cure”
Easily Reworkable – No Outgassing
Bonds in Seconds – Not Hours or Minutes
Low Modulus Reduces Stress to Bonded Materials**

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

TYPICAL PROPERTIES

Typical Properties	191	292	393	793
Filler Material	Silver	AlN	None	Alumina
Attach Temperature Range	150 to 220 °C	150 to 220 °C	150 to 220 °C	150 to 220 °C
Continuous Use Range	-65 to 150 °C	-65 to 150 °C	-65 to 150 °C	-65 to 150 °C
Max Excursion Temperature	280 °C	280 °C	280 °C	280 °C
Thermal Conductivity (W/mK)	≥ 3.0	≥ 1.0	≤ 0.25	≤ 0.6
Volume Resistivity (Ohm-cm)	≤ 5 x 10 ^{-2*}	≥ 1 x 10 ⁺⁹	≥ 1 x 10 ⁺⁹	≥ 1 x 10 ⁺⁹
Die Shear Adhesion @ 25 °C	≥ 2400 psi	≥ 3000 psi	≥ 2500 psi	NE
Elastic Modulus (psi)	≥ 500,000	≥ 500,000	≥ 500,000	≥ 500,000
Viscosity (Brookfield RTV @ 2.5 RPM)	168 to 252 kcps	100 to 180 kcps	38.5 to 71 kcps	-

Typical Properties	191	292	393	793
Glass Transition Temp. (T _g)	≥ 50 °C	≥ 50 °C	≥ 50 °C	≥ 50 °C
Shelf Life @ 25 °C	1 year	1 year	1 year	1 year

* **United States Patent #5,061,549**

* **United States Patent #5,401,536**

PASTE CHARACTERISTICS

These products are supplied at a rheology suitable for screen printing. Viscosity, as measured on a Brookfield RVT Viscometer using a #6 spindle at 2.5 rpm (25° + 1°C), is as follows: 191, 168 to 252Kcps; 292, 108 to 162Kcps; 393, 38.5 to 71.5Kcps; 793, none established. Use a stainless steel screen with a 60 to 105 mesh count and a backside emulsion build-up of 0.5 to 6.0 mils. After screening, the paste can be dried at 120 to 150 °C for 15 to 30 minutes.

After drying, substrates can be stored for long periods of time at room temperature in ambient conditions (although dry box storage is recommended) without altering the properties of the adhesive. For silver filled paste expect a wet to dried thickness reduction in the Z-axis of approximately 30 to 40%. For Aluminum nitride, Aluminum oxide, filled and non-filled pastes, expect a wet to dried thickness reduction of approximately 60 to 70%.

Deposition via syringe is also possible. Standard syringe sizes available are 3cc, 5cc, 10cc, and 30cc. Equipment best suited to dispensing these materials incorporates a mechanical or vacuum pull-back, anti-tailing feature.

BONDING

Bond pre-dried deposits at 150 to 220 °C. Pressure required is dependent on temperature and dwell time at temperature. Lower temperatures require higher pressures. Higher temperatures require little or no pressure. It is critical that both interfaces to be bonded reach the required temperature. Typical pressures for most applications range from 1 to 10 psi. Time required to form a bond will depend on the application. Bonds can be formed in seconds under optimum conditions. Typical recommended bond times are 10 to 60 seconds. Equipment used for heating can range in sophistication from a hot plate to a box oven or continuous feed belt furnace.

It is possible to perform "zero pressure" attachment of small components and die by placing them directly in the wet deposited material. It is necessary to control the heating ramp rate in order to slowly volatilize the solvent system. Typically, the ramp rate should be 10 °C per minute or less with a peak temperature of 220 °C and a dwell time at the peak temperature of at least 10 minutes.

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

STORAGE

Material should be stored at 25 °C if in a metal can or 0 to 10 °C if in plastic syringes or plastic jars. It is recommended that the material be allowed to reach room temperature before using material. Remove material from cold storage and set aside, allowing it to thaw at room temperature, until it reaches room temperature (60 minutes maximum for 30cc syringe). To prevent contamination of unused product, do not return any material to its original container.

Shelf life of sealed, unopened containers is 12 months from date of manufacturing. If the material is kept beyond the recommended shelf life, it is not necessarily unusable. But, a quality control should be performed on the properties relevant to the application.

CONTACT INFORMATION

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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