

# CoolTherm<sup>®</sup> MD-140 SP Conductive Adhesive

## Technical Data Sheet

CoolTherm<sup>®</sup> MD-140 SP (Small Particle) silver-filled conductive adhesive offers excellent thermal conductivity. It is designed for use in thermally demanding die attach applications such as microprocessor, power semiconductor and VLSI assembly. CoolTherm MD-140 SP adhesive is low stress, making it suitable for use with large die.

CoolTherm MD-140 SP adhesive provides excellent adhesion to a wide variety of surfaces including silicon, silver, gold and copper. Low ionic levels make it ideally suited for demanding semiconductor and hybrid assembly applications.

### Features and Benefits:

**Convenient** – provides a working life of up to 72 hours after loading a syringe into the dispensing equipment at room temperature.

**Excellent Dispensability** – allows high-speed, accurate syringe dispensing of fine dots or lines; can be used with time/pressure, positive displacement or linear dispense heads.

**Fast Cure** – rapidly cures at 150°C and 180°C.

### Application:

**Applying** – Before use with dispensing equipment, allow adhesive to be warmed to room temperature (ideally 20-25°C). Thaw adhesive by placing the syringe in a vertical (upright) position with dispense tip facing downward in an ambient environment. Consult handling instructions<sup>†</sup> for specific guidelines.

Mount the syringe onto the dispensing equipment that has been thoroughly cleaned and purge adhesive through the system until an unbroken flow of adhesive is extruded. The system is now ready to begin dispensing.

<sup>†</sup>Handling instructions are available on [Parker.com](http://Parker.com).

**Curing** – Allow adhesive to cure for 5-10 minutes at 120°C, for 3-5 minutes at 150°C, or for 1-3 minutes at 180°C. This time-at-temperature profile refers to the time the material should be allowed to cure once it reaches the target temperature. Allowance should be made for oven ramp rates, parts with large thermal mass and other circumstances that may delay material reaching the target temperature.

### Typical Properties\*

#### Uncured

Appearance	Silver Paste
Viscosity, cP @ 25°C CP-52, 10 rpm	34,000
Specific Gravity	3.7

#### Cured

Thermal Conductivity, W/m·K**	12
Coefficient of Linear Thermal Expansion, ppm/°C alpha 1 alpha 2	60 190
Glass Transition Temperature (T <sub>g</sub> ), °C by TMA	82
Die Shear Strength, MPa (psi)	56.4 (8200)
Storage Modulus, MPa @ 25°C	3300
Volume Resistivity, ohm-cm @ 25°C	0.0001
Extractable Ionic Contaminants, ppm Chloride Sodium Potassium	<50 <5 <1

\*Data is typical and not to be used for specification purposes.

\*\* Cure for analysis 2 hours at 150°C. Measured by Laser Flash method.

## Shelf Life/Storage:

Shelf life is six months when stored at -40°C in original, unopened container. Syringe must be maintained at -40°C in a vertical (upright) position with the dispense tip facing down. Do not store syringe on its side (horizontally).

This material is shipped and stored frozen. Consult handling instructions<sup>†</sup> for thawing.

## Cautionary Information:

Before using this or any Parker Lord product, refer to the Safety Data Sheet (SDS) and label for safe use and handling instructions.

*For industrial/commercial use only.* Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Values stated in this document represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Support Center.

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