

ATROX[®] 590-4HT50

Electrically and Thermally Conductive Die Attach Adhesive

DESCRIPTION

ATROX 590-4HT50 is a thermosetting conductive die attach adhesive with 50µm spacers with very high thermal conductivity designed for high-power semiconductors and exposed pad semiconductor packages. **ATROX 590-4HT50** die attach adhesive has excellent adhesive strength to Cu, NiPdAu leadframes, and solder-mask surfaces. **ATROX 590-4HT50** has low outgassing which minimizes oven contamination and is ideal for excellent MSL performance.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

TYPICAL PROPERTIES

Material Properties	Method	Value	Remarks
A. Uncured			
Chemical type		Thermosetting	
Color	Visual	Grey	
Viscosity at 25 °C at 5.0 RPM	ASTM D2196-99	15,900 cps	Brookfield Spindle 51
Thixotropic index (0.5 RPM/5.0 RPM)	ASTM D2196-99	5.90	Brookfield Spindle 51
Spacer size		50 microns	
Pot Life @ 23 °C (elapsed time for 25% increase in viscosity)	ISO 10364:1993	24 hours	Brookfield Spindle 51
Storage Temperature		-40 °C	
Shelf Life @ -40 (°C/°F)		6 months	
B. Cured			

Material Properties	Method	Value	Remarks
Glass Transition (Tan δ Max)	DMA	70 °C	
Modulus at 25 °C	DMA	6.0 GPa	
Modulus at 260 °C	DMA	0.50 GPa	
CTE 1 (below Tg)	TMA	50 ppm	
CTE 2 (below Tg)	TMA	175 ppm	
Thermal Conductivity: Bulk	Laser Flash	8 W/mK	
Volume Resistivity	4-Point Probe	0.000062 Ohm-cm	

DIE SHEAR STRENGTH (3 mm x 3 mm)

A. Metallized Die (3mm x 3mm)

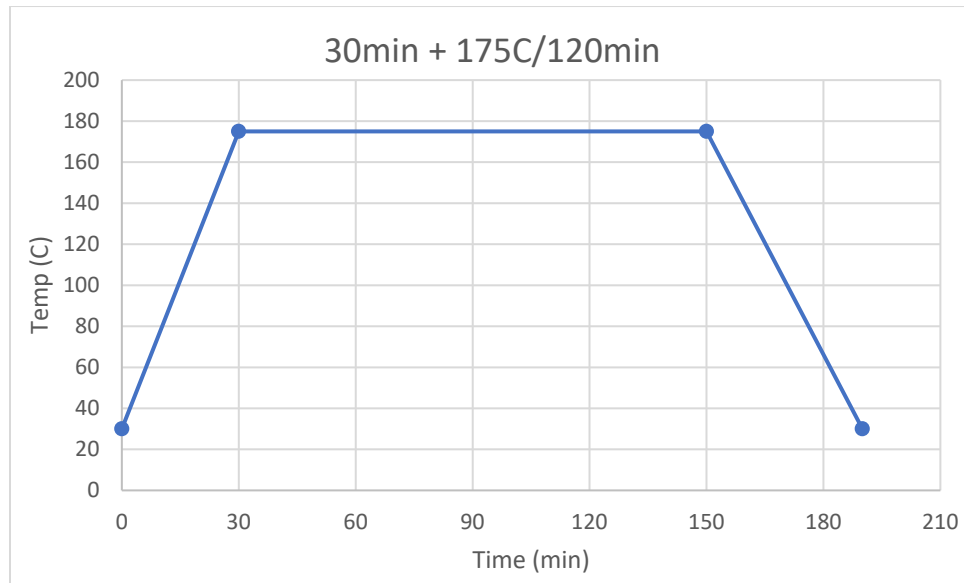
Lead Frame	Cure Condition	Measuring Temperature	Value
Ag	30min + 175 °C/120min	260 °C	5.4 Kg-F
NiPdAu (PPF)	30min + 175 °C/120min	260 °C	5.8 Kg-F
Cu	30min + 175 °C/120min	260 °C	6.2 Kg-F

MATERIAL APPLICATION

ATROX 590-4HT50 is formulated to be applied using a time pressure pump equipped on most die bonders. The material should be consistently dispensed over time. Equipment settings need to be optimized for desired material deposition response based on model and configuration

CURE

ATROX 590-4HT50 cures using a ramp profile with a 30-minute ramp to 175 °C and soak for 120 minutes. It is recommended that the cure schedule includes at ramp at 5 to 10 °C and a controlled cooling cycle to minimize thermal stresses. Depending on the thermal mass of the application cure times may vary and should be optimized by the end user.



RELIABILITY PERFORMANCE

ATROX 590-4HT50 is recommended for excellent reliability with stable electrical and thermal performance during MSL and thermal cycling. There is no limitation on die size for metalized die packages. However, it is recommended to consult with your local technical service for optimizing critical parameters for specific packages.

It is also possible to assemble bare silicon dies up to 10 mm² with excellent electrical and thermal performance. For die sizes larger than 10 mm², kindly contact MacDermid Alpha Electronic Solutions for assistance.

CLEAN-UP

Uncured material may be cleaned from dispenser components and surfaces with a variety of solvents, including IPA, acetone, MEK, methylene chloride, etc. Always wash and dry thoroughly prior to re-use of the dispenser components. The cleaning technique should be active cleaning of the components – flush, wash, or wipe, followed by a drying step to ensure a clean, dry surface. Do not soak since this can solubilize the hardener within the uncured resin and curing (very difficult to remove). Contact your equipment supplier to ensure the solvent is compatible with their components. Clean and maintain dispense valves as recommended by the equipment manufacturer.

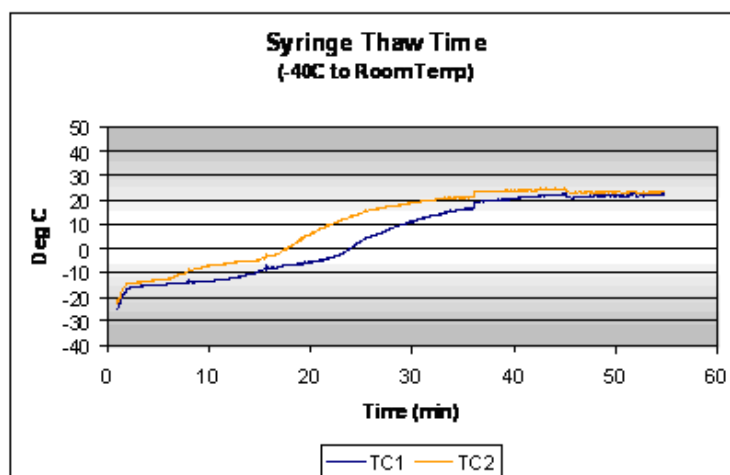
PACKAGING SIZES

ATROX 590-4HT50 is available in 5 or 10 cc EFD or Musashi syringes.

SHIPPING & STORAGE

Material is normally shipped in insulated boxes using dry ice to ensure that the ATROX 590-4HT50 maintains all its properties. On receipt, it must be ensured that dry-ice remnants are present in the insulated shipping box. If there is no dry ice, or if the material is not cold, then please contact MacDermid Alpha Electronics Solutions immediately. Exposing to elevated temperatures during shipment and storage will compromise on the performance aspect of the material adversely.

It is recommended to store the syringes of material at -40 °C for a maximum shelf life of 6 months. The material must be allowed to thaw before usage. Typical thawing times for 5cc and 10cc syringes are presented in chart below. Remove the syringe from freezer and set aside one hour, allowing it to thaw at room temperature, until it reaches room temperature. To prevent contamination of unused product, do not return any material to its original container.



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.**

CONTACT INFORMATION

To confirm this document is the most recent version, please contact
techinfo@MacDermidAlpha.com
www.macdermidalpha.com

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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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