

EP3HTSDA-2 Master Bond Polymer System

One component epoxy system featuring excellent electrical and thermal conductivity

Key Features

- ✓ Low volume and thermal resistivity
- ✓ Long open time at ambient temperatures
- ✓ Not premixed and frozen
- ✓ Cures rapidly at 250-300°F

Product Description

Master Bond EP3HTSDA-2 is a fast curing, one part silver filled system offering exceptionally high thermal and electrical conductivity, along with remarkably low thermal resistance. It is not premixed and frozen and has an unlimited working life at room temperature. For storage, simple refrigeration is fine. As mentioned above, it cures quickly at 250-300°F. EP3HTSDA-2 dispenses smoothly and easily.

In using it as an adhesive, it bonds well to many metals, ceramics, plastics, silicon dies and a wide variety of other substrates. It has superior physical strength properties including relatively high tensile lap shear strength. The unique attributes of EP3HTSDA-2 centers around its combination of extremely low volume resistivity and astoundingly high thermal conductivity (see below). Also, the filler particles used in this epoxy are exceptionally small (average 2-3 microns, largest less than 20), allowing for ultra thin bond lines. Ultimately, the key property of EP3HTSDA-2 is its incomparably low thermal resistance of $2-3 \times 10^{-6} \text{ K}\cdot\text{m}^2/\text{W}$.

The temperature range extends from -80°F to +450°F. Most importantly, it passes NASA low outgassing specifications. The extraordinary combination of easy handling, convenient storage, superlative thermal conductivity and phenomenally low thermal resistance make it a must go-to material in applications where high heat transfer is required and electrical conductivity is not an issue.

Product Advantages

- Single component system; no mixing needed
- Not premixed and frozen; unlimited working life at room temperature
- Highly electrically conductive
- Beyond impressive thermal conductivity
- Incredibly low thermal resistance
- NASA low outgassing
- Available in syringes that are compatible with automatic or manual dispensing equipment

Typical Properties

Tensile lap shear strength, aluminum to aluminum, 75°F	800-1,000 psi
Tensile strength, 75°F	3,000-4,000 psi
Tensile modulus, 75°F	200,000-250,000 psi
Die shear strength, 75°F (2 x 2 mm [80 x 80 mil])	20-22 kg-f
Typical die size	4-400 mm ²
Glass transition temperature, (T _g)	74°C
Hardness, 75°F	75-85 Shore D
Thermal conductivity, 75°F	45-49 BTU•in/(ft ² •hr•°F) [6.5-7 W/(m•K)]
Thermal resistance, 75°F	$2-3 \times 10^{-6} \text{ K}\cdot\text{m}^2/\text{W}$
Coefficient of thermal expansion, 75°F	$24-28 \times 10^{-6} \text{ in/in/}^\circ\text{C}$
Volume resistivity, 75°F	<0.001 ohm-cm
Service temperature range	-80°F to +450°F [-62°C to +232°C]

MASTERBOND® EP3HTSDA-2 Technical Data Sheet

Typical Properties (con't)

Solids content	100%
Specific gravity, 75°F	3.2
Viscosity, 75°F	>400,000 cps (thixotropic)
Thixotropic index, 75°F	6.75
Color	silver
Cure schedule options	
250°F	20-30 minutes
300°F	5-10 minutes
Optimum cure schedule	either option above, plus 1 hour at 250-300°F
Shelf life at 40-50°F in original, unopened containers	minimum 3 months, maximum 6 months

Preparation of Adhesive & Bonding Surfaces

Master Bond EP3HTSDA-2 does not require any mixing before use. If packaged in jars, some simple stirring is recommended if the adhesive has been stored for a prolonged time period without use. Such stirring should be done slowly to avoid entrapping air. Using the adhesive is easy; simply apply the required amount on the surface to be bonded in an even and uniform manner.

All bonding surfaces should be carefully cleaned, degreased and dried to obtain maximum bond strength. Metal and other surfaces should be chemically etched or mechanically abraded (e.g. sand blasted) for maximum bond strength. If this is not possible, surfaces should be roughened as much as possible with sandpaper or emery paper.

Application and Assembly

EP3HTSDA-2 is most easily applied when dispensed from a syringe. However, if packaged in a jar, it can be easily placed on the substrate with a spatula or knife. Enough adhesive should be applied to obtain a final adhesive bond line thickness of a few thousands of an inch. Porous surfaces may require somewhat more adhesive to fill the voids than non-porous ones. The parts to be bonded should then be clamped together with just enough pressure to maintain intimate contact during cure. Since EP3HTSDA-2 is 100% reactive and does not contain any solvents, shrinkage upon cure is minimal.

Cure

EP3HTSDA-2 requires an elevated temperature cure. Typical recommended curing schedules are 20-30 minutes at 250°F or 5-10 minutes at 300°F. For optimal properties, cure at either schedule mentioned previously with a post

cure of 1 hour at 250-300°F. Remove excess adhesive promptly before it hardens with a spatula. Then wipe with a rag and solvent, such as acetone, toluene or MEK.

Packaging

Product is available in:

- 20 grams
- 50 grams
- 100 grams
- One pound
- Multiple pounds



Packaged in either syringes or glass jars.

Handling and Storage

All epoxy resins should be used with good ventilation and skin contact should be avoided. For safe handling details, please consult the product SDS. Recommended storage is in refrigeration at 40-50°F. Containers should, however, be kept closed when not in use to avoid contamination. Cleanup of spills and equipment is readily achieved with aromatic or ketone solvents employing proper precautions of ventilation and flammability.

Certifications



MASTERBOND® EP3HTSDA-2 Technical Data Sheet**Not to Be Used for Specification Purposes**

The values contained herein are considered typical properties only and are not intended to be used as specification limits. For assistance in preparing specifications, please contact Master Bond technical support for further details.

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