EP46HT-2AO Black Master Bond Polymer System

Two part high performance epoxy for bonding, sealing and encapsulation

Key Features

- ✓ **Long working life**
- ✓ **Thermally conductive, electrically insulative**
- ✓ **Passes NASA low outgassing test requirements**
- ✓ **Good high temperature resistance**

Product Description

Master Bond EP46HT-2AO Black is a two component epoxy system for demanding bonding, sealing and encapsulation applications where thermal conductivity, electrical insulation and high temperature resistance are required. It is 100% reactive and does not contain any solvents or diluents. EP46HT-2AO Black is formulated to cure rapidly and requires a cure temperature of 250°F or more. An optimal curing schedule is 3-4 hours at 250-300°F followed by a post cure of 2-3 hours at 350-400°F. The glass transition temperature is quite high, exceeding 200°C and the service temperature range is -100°F to +500°F. Once cured, EP46HT-2AO Black features exceptional physical and mechanical properties, along with exquisite dimensional stability. It bonds well to a wide variety of substrates including metals, glass, ceramics, composites, various rubbers and many plastics. It is a highly functional electrical insulator. It has very good chemical resistance to water, fuels, oils, acids and bases. Most importantly, it passes NASA low outgassing testing. The color of Part A is black and Part B is gray. This high powered combination of product properties allows this system to be used in challenging applications in aerospace, electronics, opto-electronics and in vacuum environments.

Product Advantages

- Extremely forgiving mix ratio
- Very long open time at room temperature
- Top notch heat resistance
- Thermally conductive, electrically insulative
- High quality dimensional stability
- Meets NASA low outgassing requirements
- Passes fungus resistance MIL-STD-810G

Typical Properties

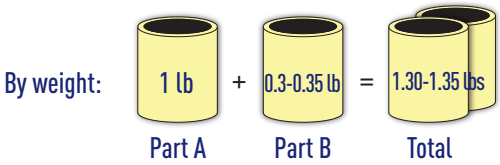
Tensile lap shear strength, 75°F, aluminum to aluminum	1,400-1,600 psi
Tensile strength, 75°F	6,000-7,000 psi
Tensile modulus, 75°F	550,000-600,000 psi
Compressive strength, 75°F	26,000-28,000 psi
Hardness, 75°F	85-90 Shore D
Coefficient of thermal expansion, 75°F	21-24 x 10^{-6} in/in/°C
Glass transition temperature (T_g)	140-150°C
Thermal conductivity, 75°F	9-10 BTU•in/(ft²•hr•°F) [1.2981-1.4423 W/(m·K)]
Volume resistivity, 75°F	>10^{14} ohm-cm
Dielectric strength, 75°F (1/8 inch thick test specimen)	450 volts/mil
Service temperature range	-100°F to +500°F [-73°C to +260°C]

Mixing and Curing

Mixing ratio, Part A to B	100:30-35 by weight
Viscosity of Part A, 40°C	40,000-80,000 cps
Viscosity of Part B, 75°F	20,000-40,000 cps
Mixed viscosity, 75°F	140,000-280,000 cps (thixotropic)
Working life after mixing, 75°F; 100 gram batch	>24 hours
Cure schedule, 250-300°F	3-4 hours
Post cure, 350-400°F (recommended for optimum properties)	2-3 hours
Shelf life at 75°F, in original unopened containers	minimum 6 months, maximum 1 year

Preparation of Adhesive

Prior to mixing together in a 100 to 30-35 ratio, both Parts A and B should be individually stirred so that the filler is uniformly dispersed. Only then, should the A and B be mixed together.



Mixing should be done slowly to avoid entrapping air. Color coding makes mixing easy; Part A is colored black, Part B is colored gray. Simply mix the proper amounts of Parts A and B, by weight, and stir until color is uniform. The working life of a mixed 100 gram batch is greater than 24 hours.

Preparation of Bonding Surfaces

All bonding surfaces should be cleaned, degreased and dried to achieve maximum bond strength. When bonding to metal or plastic surfaces, chemical etching may be necessary to ensure optimal environmental durability. All substrates should be roughened with sandpaper or emery paper followed by solvent cleaning using acetone or xylene.

Application and Assembly

Master Bond EP46HT-2AO Black can be conveniently applied with a spatula, knife or trowel. Enough mixed material should be applied to obtain a final system bond line thickness of 4-6 mils. Porous surfaces may require somewhat more material to fill the voids than non-porous ones. Thicker glue lines do not increase the strength of a joint but does not necessarily give lower results as EP46HT-2AO Black does not contain any volatiles. The parts to be bonded should then be pressed together with just enough pressure to maintain intimate contact during cure. Care should be taken not to squeeze out all of the adhesive during fixturing. When potting and casting, it may be necessary to vacuum degas to remove the relatively few air bubbles that may have been formed while mixing.

Cure

EP46HT-2AO Black has a number of different elevated cure schedules in the 250-400°F range as desired. At 250-300°F, cure times are in the order of 3-4 hours. For optimal properties, post cure for 2-3 hours at 350-400°F is recommended. All excess material should be removed promptly with a spatula or knife before it hardens. Clean any residue with a rag and solvent using acetone, xylene, or toluene.

Packaging

Product is available in:

- 1/2 Pint kits
- Pint kits
- Quart kits
- Gallon kits
- 5 Gallon kits

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's SDS. Optimum storage is at or below 75°F in closed containers. No special storage conditions are necessary. 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

NASA Low Outgassing

MIL-STD-810G for fungus resistance

RoHS COMPLIANT

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.

Notice

Master Bond believes the information on the data sheets is reliable and accurate as is technical advice provided by the company. Master Bond makes no warranties, expressed or implied, regarding the accuracy of the information, and assumes no liability regarding the handling and use of this product.

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