

# Technical Data Sheet

## MASTER BOND POLYMER SYSTEM EP42HT-2

**Two Component, Room Temperature Curable, Heat Resistant Epoxy Adhesive, Sealant, Coating & Casting System Featuring Resistance to Medical Type Sterilization Including Radiation, Chemicals and Steam. Meets USP Class VI Requirements.**

### Product Description

Master Bond Polymer System EP42HT-2 is a room temperature curable two component epoxy, adhesive, sealant, coating and casting material featuring high temperature resistance along with outstanding chemical resistance. It is widely used in medical devices because of its capability of withstanding repeated sterilizations, including radiation, ethylene oxide, chemical sterilants, and steam. In addition, it fully complies with the testing requirements of USP Class VI plastics. While EP42HT-2 is a superior adhesive, sealant and coating, it is also castable to thicknesses exceeding 2-3 inches. EP42HT-2 cures readily at ambient or more quickly at elevated temperatures. One particularly popular cure schedule is "overnight" at room temperature followed by 2-4 hours at 150-200°F.

It has an easy to use 100:40 mix ratio by weight or 100:50 by volume. The cured epoxy compound is resistant to various types of sterilizations, inorganic and organic acids, alkalis, organic solvents and aromatic hydrocarbons. EP42HT-2 is an excellent electrical insulator. Especially noteworthy is its serviceability from -60°F up to 450°F, combined with resistance to steam, chemicals and radiation. Aside from its widespread use in the medical industry, EP42HT-2 is also used in electronics, electrical, fiberoptic and optical as well as OEM type applications. To optimize physical properties including heat resistance, a post cure of 100-130°C for 2-3 hours is recommended.

### Product Advantages

- Convenient non-critical 100:40 mix ratio by weight or 100:50 by volume.
- Contains no solvents.
- Convenient cure schedules at both ambient and elevated temperatures.
- Outstanding resistance to medical sterilants, radiation, ETO, chemicals and steam.
- Excellent chemical resistance to acids, alkalis and many solvents.
- Superior thermal stability; serviceable up to 450°F.
- Castable to thicknesses exceeding 2-3 inches.
- Conforms to the requirements for a USP Class VI plastic.
- Available in amber-clear and black as a Class VI system.
- Service temperature -60°F/450°F

### Product Properties

- Mix ratio, by weight, part A to part B..... 100/40
- Mix ratio, by volume, part A to part B ..... 100/50
- Viscosity, mixed, 75°F, cps..... 3500
- Working life after mixing, 100 gram mass, 75°F, minutes..... 45-60
- Cure schedule
  - 75°F, ..... 24-48 hrs
  - 200°F, ..... 2-3 hrs
- Tensile strength, 75°F, psi..... >12,000
- Elongation, 75°F, %..... 3.4
- Tensile lap shear, Al/Al, 75°F, psi..... >2000
- Tensile modulus psi..... >450,000
- Coefficient of thermal expansion, in/in x 10<sup>-6</sup>/°C ..... 35-40
- Volume resistivity, 75°F, ohm-cm..... >10<sup>14</sup>
- Dielectric constant, 75°F (60Hz)..... 3.8
- Service temperature range, °F ..... -60 to 450°F
- Hardness, Shore D ..... >75
- Shelf life at 75°F, in unopened containers..... 6 months
- Parts A and B available in syringes, pints, quarts, gallons and five gallon containers.

### **Special Chemical Resistance Data**

Resistant at Room Temperature, 77°F (immersion): Acetic acid (10%), Ammonium hydroxide (29%), Butyl alcohol, Calcium hypochlorite (5%), Citric acid (10%), Cottonseed oil, Distilled water, Ethylene glycol, Formaldehyde (37%), Gasoline (98% octane), Hydrochloric acid (10%), Hydrogen peroxide (20%), Lard, Linseed oil, Mineral oil, Phosphoric acid (10%), Propylene glycol, Sea water, Sodium hydroxide (20%), Sodium hydroxide (50%), Sodium sulfite (1%), Sour crude oil, Sulfuric acid (10%), Tap water, Toulene, Zinc hydrosulfite (1%).

Resistant at 200°F (immersion): Citric acid (10%), Ethylene glycol, Hydrochloric acid (10%), Mineral oil, Phosphoric acid (10%), Propylene glycol.

Satisfactory Resistance to Spillage Above 200°F: Carbon tetrachloride, Ethyl alcohol, Gasoline, Hydrochloric acid (10%), O-dichlorobenzene (10%), Sodium hydroxide (10%), Sulfuric acid (10%), Tap water, Xylene.

### **Preparation of Compound and Bond Surfaces**

Master Bond Polymer System EP42HT-2 is prepared for use by thoroughly mixing part A with part B in a noncritical 100 to 40 mix ratio by weight or 100 to 50 by volume. Mixing should be done slowly to avoid trapping air. The working life of a mixed 100 gm batch is 45-60 minutes. It can be further lengthened by using shallow mixing vessels or mixing smaller size batches. All bonding surfaces should be carefully cleaned, degreased and dried to obtain maximum bond strength. Certain metal or plastic surfaces should be mechanically or chemically etched in order to maximize bond strength. Castings can be accomplished in rubber, plastic or metal molds after application of appropriate mold releases. When casting, vacuum degassing may be necessary to eliminate all air bubbles.

### **Application and Assembly**

For potting and casting the EP42HT-2 is readily pourable. For bonding or sealing EP42HT-2 can be conveniently applied with a brush, paint roller, spatula or knife. Enough mixed adhesive should be applied to obtain a final adhesive bond line thickness of 4-6 mils. This can be accomplished by coating one surface with an adhesive film 4-6 mils thick or by coating the two surfaces, each with a 2 to 3 mil thick layer of adhesive. Porous surfaces may require somewhat more adhesive to fill the voids than non-porous ones. Thicker glue lines do not increase the strength of a joint but do not necessarily give lower results since EP42HT-2 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.

### **Cure**

Master Bond Polymer System EP42HT-2 can be cured at room temperature or at elevated temperatures as desired. At room temperature, Master Bond Polymer System EP42HT-2 develops 85% of its maximum bond strength within 24-48 hours. The bond strength then increases continuously for another 2-3 days. Faster cures can be realized at elevated temperatures, 2-3 hours at 200°F for full strengths. When potting, the thicker the section, the faster the rate of cure.

### **Handling and Storage**

All epoxy resins should be used with good ventilation. Skin contact should be minimized. To remove resin or hardener from skin use mild solvent then wash with soap and water. If material enters the eyes, flood with water and consult a physician. 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 acetone or xylene employing proper precautions of ventilation and flammability.

## **Master Bond Inc.**

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