EP13 Master Bond Polymer System

One component, heat curing epoxy for structural bonding applications

Key Features

- ✓ High tensile lap shear strength
- ✓ Serviceable up to +500°F
- ✓ Smooth high viscosity consistency
- ✓ Excellent adhesion to a variety of substrates
- ✓ First class chemical resistance
- ✓ Superior electrical isolation properties

Product Description

Master Bond EP13 is a one component, heat curing epoxy with exceptional temperature resistance and excellent bonding attributes. This one component system will cure at temperatures of 300-350°F for 60-90 minutes. For optimum properties, a post cure of 2 hours at 350-400°F is highly recommended. It is primarily used as a structural adhesive. EP13 is somewhat exothermic and is typically cured in bond line thickness of 2-8 thousandths of an inch. EP13 is a smooth, high viscosity thixotropic system that is easy to apply. It has a wide array of desirable physical strength properties. The lap shear strength exceeds 3,500 psi, the compressive strength is over 16,000 psi and the tensile modulus is 450,000-500,000 psi. EP13 is readily machinable. The service temperature range is -60°F to +500°F. EP13 bonds well to wide variety of substrates including metals, glass, ceramics, composites, many rubbers and plastics. It serves up first class chemical resistance to fuels, oils, acids, bases and many solvents. The standard color is gray. Additionally it has fine electrical insulation properties. EP13 is particularly well suited for rigorous structural bonding applications in aerospace, specialty OEM and related industries.

Product Advantages

- Single component system; no mixing prior to use. Unlimited working life at room temperature
- Easy to apply, smooth high viscosity consistency
- High tensile shear and compressive strength. Excellent structural adhesive
- Wide temperature range, superb heat resistance
- Bonds well to a wide range of substrates
- Good machinability

Typical Properties

Solids content	100%
Viscosity, 75°F	smooth, self leveling consistency
Cure Schedule	
300-350°F	60-90 minutes
Post cure for optimum properties, 350-400°F	2 hours
Tensile strength, 75°F	9,000-10,000 psi
Tensile lap shear strength, aluminum to aluminum, 75°F	3,500 psi
Tensile modulus, 75°F	450,000-500,000 psi
Compressive strength, 75°F	18,000-20,000 psi
Hardness, 75°F	80-85 Shore D
Coefficient of thermal expansion, 75°F	25-30 x 10^{-6} in/in/°C
Volume resistivity, 75°F	>10^{13} ohm-cm
Dielectric constant, 75°F, 60Hz	4.5
Shelf life at 40-50°F, in original, unopened containers	minimum 3 months, maximum 6 months
Service temperature range	-60°F to +500°F [-51°C to +260°C]

Preparation of Adhesive

Master Bond EP13 does not require any mixing before use. 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 and apply the adhesive on the surface to be bonded evenly and uniformly.

Preparation of Bonding Surfaces

All bonding surfaces should be carefully cleaned, degreased and dried to obtain maximum bond strengths. When bonding to metal or plastic surfaces, chemical etching might have to be used to obtain optimum performance properties. At the minimum, all substrates should be roughened or mechanically abraded followed by solvent cleaning using acetone or xylene.

A simple yet effective test for surface cleanliness is to place a few drops of cool water on the surfaces to be bonded. Parts are sufficiently clean if the water spreads over the area with a continuous film. If the water beads or stays in puddles use a solvent such as acetone or MEK for degreasing and repeat the water test before applying the adhesive.

Application and Assembly

Master Bond EP13 can be conveniently applied with a spatula, knife, trowel, brush, paint roller, etc. Enough adhesive should be applied to obtain a final adhesive bond line thickness of 2-8 thousandths of an inch. 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 as the EP13 adhesive system does not contain any volatiles. The parts to be bonded should then be clamped together with just enough pressure to maintain intimate contact during cure. Care should be taken not to squeeze out the epoxy when fixturing. Since EP13 is 100% reactive and does not contain any solvents, shrinkage on cure is minimal.

Cure

Master Bond EP13 requires an elevated temperature cure. The recommended curing schedule is 60-90 minutes at 300-350°F for maximum bond strength. To optimize its properties, a post cure of 2 hours at 350-400°F is recommended. Only contact pressure need be applied during the curing process. Excess adhesive should be removed promptly before it hardens with a spatula. After removal of the excess adhesive, wipe with a rag and solvent such as acetone or MEK. As mentioned earlier EP13 is exothermic and should be not cured in sections thicker than 10 thousandths of an inch.

Packaging

Product is available in:

- Pints
- Quarts
- Gallons
- 5 Gallons

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 between 40-50°F in original, unopened containers, with a minimum shelf life of 3 months, and a maximum shelf life of 6 months. Cleanup of spills and equipment is readily achieved with aromatic or ketone solvents employing proper precautions of ventilation and flammability.

Certifications

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.

J31C19