Technical Data Sheet

MASTER BOND POLYMER SYSTEM EP30FL

Low Viscosity, Flexibilized, Two Component Epoxy Compound for High Performance Potting, Casting, Encapsulation, Bonding and Sealing.

Product Description

Master Bond Polymer System EP30FL is a low viscosity, flexibilized, two component epoxy resin system for high performance potting, casting, encapsulation as well as bonding and sealing. It is formulated to cure at room temperature or more rapidly at elevated temperatures, with a four (4) to one (1) mix ratio by weight. This compound is 100% reactive and does not contain any solvents or other volatiles. It is especially recommended where low viscosity is required for ease of application, and where the pottings, castings and encapsulations must withstand mechanical shock, vibration or thermal cycling without cracking. Shrinkage after cure is exceptionally low.

Master Bond Polymer System EP30FL produces high strength and tough flexible castings, bonds and seals which are remarkably resistant to thermal cycling and chemicals including water, oil and most organic solvents, over the temperature range of 4K to more than 250°F, making it suitable for cryogenic applications. Adhesion to both similar and dissimilar materials including metals, glass, ceramics, wood, vulcanized rubbers and many plastics is excellent. The hardened compound is an electrical insulator. Color of part A is clear, part B slightly yellow. Master Bond Polymer System EP30FL is widely used in the electronic, electrical, computer, construction, metalworking, appliance, automotive and chemical industries. EP30FL-1 is a higher viscosity version of EP30FL.

Product Advantages

- Convenient mixing: easy-to-use mix ratio, four (4) to one (1) by weight.
- Moderately low exotherm, ideal for moderate sized castings.
- Easy application, low viscosity; well suited for potting and encapsulating.
- Versatile cure schedules: ambient temperature cures or fast elevated temperature cures as required.
- High bonding strength to similar and dissimilar substrates; good peel and shear strength.
- Superior thermal shock resistance and thermal cycling properties.
- Excellent electrical insulation properties.
- High impact resistance and mechanical shock resistance.

Product Properties

- Mixing ratio, by weight, parts A to B 4/1
- Part A properties, typical viscosity, cps at 25°C ..... < 3500
- Part B properties, typical viscosity, cps at 25°C ..... < 500
- Working life after mixing, 75°F
  - 100 gram mass ..... 40-45 minutes
  - 200 gram mass ..... 25-30 minutes
- Cure schedule, room temperature:
  - 95% of maximum strength developed within ..... 24 hours
  - Ultimate strength attained after..... 2-3 days
- Cure schedule, elevated temperatures:
  - 40°C (104°F) .... 8-10 hours
  - Or 100°C (212°F) .... 2-3 hours
- Tensile strength, 75°F, psi..... ..... >5,000
- Tensile shear strength (Al to Al), room temperature cure, 75°F, psi 218 0
- Elongation %, room temperature cure, 75°F, psi 50
- Hardness, Shore D 37
- Service temperature range, °F .... 4K to +250°F
- Shelf life at 75°F, in unopened containers .... 1 year
- Parts A and B available in pint, quart, 1 (one) gallon and 5 (five) gallon containers.

Electrical Properties

- Volume resistivity, 25℃, ohm-cm ..... > 10^{15}
  100℃, ohm-cm .....6 x 10^{12}
- Dielectric constant, 25℃, 60Hz 3.8 3
  1 KHz 3.95
  1 MHz 3.53
- Dielectric constant, 100℃ 60Hz 4.05
  1 KHz 4.08
  1 MHz 3.83
- Dissipation factor, 25℃, 60Hz 0.008
  1 KHz 0.010
  1 MHz 0.020
- Dissipation factor, 100℃ 60Hz 0.009
  1 KHz 0.008
  1 MHz 0.021

Preparation of Compound and Bonding Surfaces

Master Bond Polymer System EP30FL is prepared for casting, bonding, etc., by thoroughly mixing part A with part B in a four (4) to one (1) mix ratio by weight. Mixing should be done slowly to avoid entrapping air. The low viscosity of the two components makes mixing easy. The working life of a mixed 100 gram batch is approximately 40 to 45 minutes and that of a 200 gram batch 25 to 30 minutes. It can be substantially lengthened by using shallower mixing vessels or mixing smaller size batches. All bonding surfaces should be carefully cleaned, degreased and dried for obtaining maximum bond strengths. Also when bonding to certain metal surfaces, vulcanized rubbers, etc., chemical etching should be employed for optimal adhesion and environmental durability. Non-porous surfaces should be roughened with sandpaper or emery paper for hard materials. Where adhesion is not desired, the contacting surfaces should be sparingly treated with a conventional mold release. Waxes, silicones, etc., are suitable.

Application and Assembly

For potting and casting the EP30FL is readily pourable. For bonding or sealing EP30FL can be conveniently applied with a brush, paint roller, spatula, knife, etc. Enough mixed adhesive should be applied to obtain a final adhesive bond line thickness of 3-5 mils. This can be accomplished by coating one surface with an adhesive film 3-5 mils thick or by coating the two surfaces, each with a 1.5 to 2.5 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 as the EP30FL epoxy resin system 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 EP30FL can be cured at room temperature or at elevated temperatures as desired. At room temperature, Master Bond Polymer System EP30FL develops 95% of its maximum bond strength within 24 hours. The bond strength then increases continuously for about 2-3 days. Faster cures can be realized at elevated temperatures, e.g., 8-10 hours at 40℃ (104℉) or 2-3 hours at 100℃ (212℉) for full strengths. When potting, the thic ker the section, the faster the rate of cure.

Handling and Storage

All epoxy resins should be used with good ventilation taking care to minimize skin contact. Master Bond Polymer System EP30FL employs a low toxicity-low skin irritation "safety" hardener. To remove resin or hardener from skin, use solvent, then wash with mild soap and water. If material enters the eyes, flood with water and consult a physician. Optimum storage is at or below 75℉ 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 isopropyl alcohol (90%), aromatic or ketone solvents employing proper precautions of ventilation and flammability.

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