

EP114

Master Bond
Polymer System

Two component, optically clear, nanosilica filled epoxy for potting, encapsulating, coating and sealing

Key Features

- ✓ Low viscosity and very long open time

✓ Superior dimensional stability
- ✓ Exceptionally low shrinkage upon curing

✓ High glass transition temperature

Product Description

Master Bond EP114 is a two component, nanosilica filled epoxy system for potting, coating and sealing. The addition of the nano particles enhances the dimensional stability and the already exceptionally low shrinkage upon curing. EP114 has a 100 to 80 mix ratio by weight. It has an unusually low viscosity along with a very long open time of 2-4 days. EP114 requires oven curing. A typical cure schedule is 2-3 hours at 250°F followed by 5-8 hours at 300°F with a 2 hour or longer post cure at 350°F, although a number of variations are possible.

EP114 bonds well to a wide variety of substrates including metals, composites, glass, ceramics and plastics. It is a top tier electrical insulator. Its T_g exceeds 200°C and the service temperature range is -100°F to +550°F. It is highly resistant to water, oils, and fuels. EP114 is optically clear and transmits light very well, especially in the range of 350 to 1600 nanometers. While EP114 is ideally suited for

small potting and encapsulation applications, it can also be used for sealing and coating. EP114 should be considered in specialty OEM, electronic, and optical applications where this combination of properties is desirable.

Product Advantages

- Low viscosity
 - Very long open time
 - First rate electrical insulation properties
 - Tested for abrasion resistance per ASTM D4060-14
 - Withstands 1,000 hours 85°C/85% RH
 - NASA low outgassing approved

Typical Properties

Tensile strength, 75°F	12,000-13,000 psi
Tensile modulus, 75°F	>1,000,000 psi
Compressive strength, 75°F	24,000-26,000 psi
Coefficient of thermal expansion, 75°F	20-22 x 10 ⁻⁶ in/in/°C
Glass transition temperature	210-215°C
Hardness, 75°F	85-95 Shore D
Hardness after 1,000 hours 85°C/85% RH	85 Shore D
Abrasion resistance, CS-17 wheel, 1,000 cycles	5.3 mg
Service temperature range	-100°F to +550°F [-73°C to +288°C]

Mixing and Curing

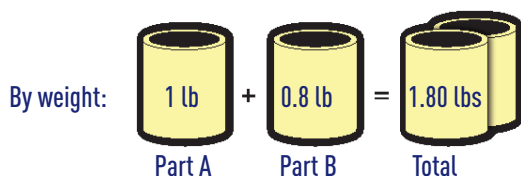
Mixing ratio, Parts A to B	100:80 by weight
Viscosity of Part A, 75°F	1,000-4,000 cps
Viscosity of Part B, 75°F	150-300 cps
Viscosity of mixed compound, 75°F	500-1,500 cps
Working life after mixing, 75°F; 100 gram batch	2-3 days
Cure schedule	2-3 hours at 250°F followed by 5-8 hours at 300°F with a 2 hour or longer post cure at 350°F
Shelf life at 75°F, in original unopened containers	1 year in cans, 6 months in syringes

Electrical Properties

Volume Resistivity		Dielectric Constant	
25°C	$>3 \times 10^{14}$ ohm-cm	25°C, 60 Hz	3.35
100°C	$>3 \times 10^{12}$ ohm-cm	100°C, 60 Hz	3.48
150°C	3.6×10^{11} ohm-cm	150°C, 60 Hz	3.94
Dissipation Factor		25°C, 1 KHz	3.40
25°C, 1 MHz	0.020	100°C, 1 KHz	3.53
100°C, 1 MHz	0.01	150°C, 1 KHz	3.99
150°C, 1 MHz	0.012	25°C, 1 MHz	3.35

Preparation of Adhesive

Master Bond EP114 is prepared for use by thoroughly mixing Part A with Part B in a 100:80 ratio by weight.



Mixing should be done slowly to avoid entrapping air. The working life of a mixed 100 gram batch is about 2-3 days.

Preparation of Bonding Surfaces

All bonding surfaces should be carefully cleaned, degreased and dried for obtaining the maximum bond strengths. Also, when bonding to metal and other surfaces, chemical etching or mechanical abrasion should be employed when the bonded joints are to exhibit optimum environmental durability. Non-porous surfaces should be roughened with sandpaper or emery paper for hard, smooth materials.

Adhesive Application

When used as a coating, EP114 can be conveniently applied with a spatula, knife, trowel, brush, paint roller, etc. Enough mixed epoxy should be applied to obtain a thickness of

typically 2-3 mils. Porous surfaces may require more material to fill the voids than non-porous ones. EP114 does not contain any volatiles. EP114 is most often used as a potting material. It may be necessary to vacuum degas to remove the relatively few air bubbles that may have been formed when mixing.

Cure

Master Bond EP114 can only be fully cured at elevated temperatures. A typical cure schedule is 2-3 hours at 250°F followed by 5-8 hours at 300°F with a 2 hour or longer post cure at 350°F, although, a number of variations are possible. Please consult with Master Bond technical support for other options. Excess adhesive can easily be removed with a spatula before it hardens, then wipe the surface with a rag and solvent such as xylene or acetone.

Packaging

Product is available in:

- Syringes
- 1/2 Pint kits
- Pint kits
- Quart kits
- 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 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



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

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