

EP42HT-2LTE Master Bond Polymer System

Two component, room temperature curing epoxy compound featuring an ultra low coefficient of thermal expansion

Key Features

- ✓ Low shrinkage upon curing
- ✓ High compressive strength
- ✓ Cryogenically serviceable
- ✓ Withstands 1,000 hours 85°C/85% RH

Product Description

Master Bond EP42HT-2LTE is an innovative, two component epoxy system with an ultra low coefficient of thermal expansion. It can be used as an adhesive, sealant, coating and, in some cases, as a casting system. EP42HT-2LTE has a forgiving 100 to 40 mix ratio by weight, or a 100 to 50 mix ratio by volume. After mixing, the consistency is that of a paste with some flow. It will cure at room temperature in 4-7 days or more quickly at elevated temperatures, e.g. 4-6 hours at 150-200°F. However, to optimize properties, the recommended cure is overnight at room temperature followed by 3-5 hours at 150-200°F. The mainstay property of this epoxy system is its exceptionally low coefficient of expansion of $9-12 \times 10^{-6}$ in/in/°C. It has an array of other highly desirable properties including stellar electrical insulation, very good chemical resistance and unsurpassed dimensional stability. This epoxy will bond well to a wide variety of substrates, including metals, composites, ceramics, glass and many plastics. It is also noteworthy for its low linear (<0.01%) and volumetric (<0.1%) shrinkage. The latter property is particularly useful in potting and encapsulation applications. Also, the compound allows

for precise alignment with minimal fixturing and simple curing. Its service temperature range is from 4K to +300°F. The color of Part A is light cream and Part B is similar, but slightly darker. EP42HT-2LTE and its very special property profile allows it to be a desirable selection for the more challenging electronic, aerospace, optical, cryogenic and specialty OEM applications. EP42HT-2LTE passes NASA low outgassing tests and is recommended for applications involving vacuums, optics and other usages that require this important property.

Product Advantages

- Non-critical 100 to 40 mix ratio by weight or 100 to 50 by volume
- Highly reliable electrical insulator
- Cryogenically serviceable
- High degree of dimensional stability
- Desirably low shrinkage
- Extraordinarily low coefficient of thermal expansion

Typical Properties

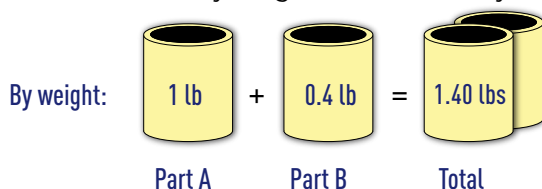
Tensile strength, 75°F	6,000-7,000 psi
Tensile lap shear strength, aluminum to aluminum, 75°F	700-900 psi
Tensile modulus, 75°F	550,000-650,000 psi
Compressive strength, 75°F	26,000-28,000 psi
Hardness, 75°F	85-95 Shore D
Hardness after 1,000 hours 85°C/85% RH	95 Shore D
Coefficient of thermal expansion, 75°F	$9-12 \times 10^{-6}$ in/in/°C
Volume resistivity, 75°F	$>10^{14}$ ohm-cm
Dielectric constant, 75°F, 60 Hz	4.4
Service temperature range	4K to +300°F [4K to +149°C]

Mixing and Curing

Mixing ratio, Parts A to B	100:40 by weight
Mixing ratio, Parts A to B	100:50 by volume
Viscosity of Part A, 75°F	paste
Viscosity of Part B, 75°F	2,000-6,000 cps
Mixed viscosity, 75°F	moderately flowable paste
Working life after mixing, 75°F; 100 gram batch	60-90 minutes
Specific gravity, Part A, 75°F	2.87
Specific gravity, Part B, 75°F	2.73
Cure schedule options	
75°F	4-7 days
150-200°F	4-6 hours
Optimum cure	overnight at 75°F followed by 3-5 hours at 150-200°F
Shelf life at 40-50°F, in original, unopened containers	minimum 3 months, maximum 6 months

Preparation of Adhesive

Master Bond EP42HT-2LTE is prepared for use by thoroughly mixing Part A with Part B in a non-critical 100 to 40 mix ratio by weight or 100 to 50 by volume.



By volume: 1 pint + 0.5 pint = 1.50 pints

It is important to note that both Parts A and B contain filler. Part A's filler is suspended in the epoxy, but with Part B, as time goes on, the filler tends settle to the bottom of the container. Simple stirring of Part B, without entrapping air, will restore the suspension. Heating Part B to 140-160°F for about 30 minutes will facilitate the process. Of course, Part B should be allowed to return to room temperature before mixing Parts A and B together.

Preparation of Bonding Surfaces

All bonding surfaces should be carefully cleaned, degreased and dried to obtain maximum bond strength. Certain metal or plastic surfaces should be mechanically roughened or chemically etched in order to maximize bond strength.

Adhesive Application and Assembly

For bonding or sealing, EP42HT-2LTE can be conveniently applied with a spatula or knife. Enough mixed adhesive should be applied to obtain an adhesive bond line thickness

of 2-4 mils. 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-2LTE 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 adhesive during fixturing. For smaller potting and casting applications, it would help to preheat the part where the epoxy is going to be applied to 40-50°C in order to augment the flow of the system.

Cure

EP42HT-2LTE can be cured at room temperature or at elevated temperatures as desired. At room temperature, EP42HT-2LTE cures within 4-7 days; faster cures can be realized at elevated temperatures, e.g. hours at 150-200°F. A desirable cure schedule to optimize its properties is overnight at room temperature followed by 3-5 hours at 150-200°F. Similar to other room temperature cure systems, the thinner the section, the slower the rate of cure.

Packaging

Product available in:

- Ounce kits
- 1/4 Pint kits
- 1/2 Pint kits
- Pint 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 40-50°F in closed containers. The cans containing Parts A and B should be stirred gently every week or two so that the product retains its uniform consistency. 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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