

GSP 1362

EPOXY POTTING AND ENCAPSULATION COMPOUND

High-Temp, Thermally Conductive, Flexible

GENERAL DESCRIPTION

GSP 1362 is a two-part epoxy potting compound designed for insulative encapsulation of electronic components in high-temperature applications. The cured system can withstand thermal cycling up to 400°F and is thermally conductive enabling the quick dissipation of heat away from embedded electronic components. Because of its flexible character, the system is resistant to both impact and thermal shock.

GSP 1362 has a long working time and processes easily with a low mixed viscosity. The mixed system provides very good wet-out of electronic components during application and has excellent adhesion to most substrates. The system cures with low exotherm.

GSP 1362 is ideal for electronic potting applications with exposure to high temperatures. The system is available in multiple packaging options including hand-mix kits and Side-by-side 1A:2B cartridge systems.

FEATURES

Easy Mix ratio
Low mixed viscosity
Excellent impact and thermal shock resistance
Long working time

Thermal conductivity
Good electrical properties
Fiber reinforced for toughness
High operating temp resistance

APPLICATIONS

Electrical Potting and Encapsulation
Casting

COMPONENT PROPERTIES, AT 77°F (25°C), TYPICAL

PROPERTY	GSP 1362 PART A	GSP 1362 PART B
Shelf Life	6 months	6 months
Density (lb/gal)	14.5-14.7	14.9-15.2
Specific Gravity	1.75	1.80
Viscosity (cps)	< 30,000	100,000
Color	Black	Tan

HANDLING PROPERTIES, AT 77°F (25°C), TYPICAL

PROPERTY	GSP 1362
Mix Ratio by Weight	48 A : 100 B
Mix Ratio by Volume	1A : 2B
Mixed Viscosity at 140°F (60°C) , cps	< 5000
Working Time (Pot Life), 77°F (25°C)	< 24 hrs
Gel Time, 100g @ 230°F (110°C), minutes	< 90
Time to 90+% Cure, hours <ul style="list-style-type: none"> • 185°F (85°C) • 230°F (110°C) 	24 12-16 hrs
Suggested Initial Cure* <ul style="list-style-type: none"> (1) Step-Cure, typical (2) Med Temp curing, minimum (3) Low temp curing, minimum 	5 hours @ 185°F (85°C) + Post-cure 6 hrs @ 250°F (121°C) 16-18 hours @ 230°F (110°C) 24 hrs @ 185°F (85°C)

* Other cure schedules are possible. Contact the GS Polymers Technical Staff to discuss your particular application.

PHYSICAL PROPERTIES*

PROPERTY	GSP 1362
Color, cured	Black
Hardness, Shore A	85A-95A
Dielectric Constant, 1 MHz	3.8
Volume Resistivity, Ohm-cm	< 10 ¹⁵
Thermal Conductivity: W/m.K	1.04
BTU-in/hr-ft ² -°F	7.2
Coefficient of Thermal Expansion (CTE) α_1	80 x 10 ⁻⁶ /°C
Operating Temperature Range	-40°C/°F to 175°C/350°F+
Upper Temperature Limit	400°F (204°C)

* Cured properties are typical for similar chemistry. Material cured 5 hours @ 185°F (85°C) plus 6 hours @ 250°F (121°C)

INSTRUCTIONS FOR USE

SIDE-BY-SIDE (SBS) CARTRIDGE:

The recommended method of application for this product is with prepackaged, side-by-side (SBS) ratio tubes using a dispenser and a static mix nozzle. To ensure an accurate mix ratio when dispensing material from a SBS tube through a static mixer nozzle, follow the steps below:

1. Remove the nozzle tip/cap. Do not discard tip/cap unless all the material in SBS tube is to be used.
2. Extrude enough material until there is an even flow of material from both openings. Discard this material.
3. Attach mix static nozzle. Extrude about ~2-3 cm (~1 inch) of material. Discard this initially extruded material. Cartridge pistons will now be precisely aligned and material on ratio.
4. Apply material from the cartridge directly to the work area.
5. To preserve leftover material in the SBS tube after application, remove and discard the static mix nozzle.
6. Clean the tip/cap thoroughly to prevent cross contamination of the tip openings.
7. Reinsert or reattach tip/cap back onto the SBS tube.

TO MIX BY HAND:

Mix Ratio: Parts by Volume (pbv): 1 part GSP 1362 Part A to 2 parts GSP 1362 Part B

Mix Ratio: Parts by Weight (pbw): 48 parts GSP 1362 Part A to 100 parts GSP 1362 Part B

Pot-Life: Do not mix more than can be applied in 30 minutes. Gel time is about 90 minutes but will vary depending on the mass mixed and the ambient temperature.

Preheat: Warming the individual components between 130-150°F will make handling the components easier.

Mixing: Proportion out components according to the parts by weight (pbw) ratio into a non-reactive container (e.g. polyethylene, polypropylene, or metal de-rimmed can). Select a container about five times larger than the volume of material mixed to allow for expansion while de-airing under vacuum. Mix components very thoroughly, preferably with a metal spatula, scraping the sides and bottom of container to incorporate all material.

De-Air: Remove air bubbles entrapped while mixing by placing mixed material in a vacuum chamber. (Vacuum should be able to achieve 29 inHg.) Liquid level should rise and then fall with some bubbling. Break vacuum partially and reapply as necessary to avoid overflow. De-air material until bubbling is minimal. Do not leave material under vacuum longer than one minute as catalysts may be stripped from the system and effect curing.

Transfer and Application: If working time allows, pour mixed material into a clean container without further scraping the sides and bottom. (In case unmixed material is still present.) Discard the residual material left behind in the mix container. If working time does not allow transfer to a clean container, dispense material taking care to avoid further scraping material from the sides and bottom of the mix container. Apply mixed material to the work area immediately.

CURING PROCEDURES:

GSP 1362 is a heat-cured system. For best results, GSP 1362 should be cured in two heat-curing steps, an initial cure step and a post-cure step. The two-step process helps to develop physical properties and minimize shrinkage in the final product.

Initial Cure: After applying to the work area, heat the polymer system according to one of the suggested temp/time regimens below. During the initial cure step, lower curing temperature requires longer curing time. Optimum properties are obtained with a higher temperature cure schedule.

- 185°F (85°C) for 18 – 24 hours
- 212°F (100°C) for 10 – 12 hours
- 250°F (121°C) for 6 – 8 hours

Post Cure: After the initial cure, increase temperature 250-300°F (121 - 150°C) and heat for an additional 2 – 4 hours. This step will drive the reaction to completion and develop final physical properties in the polymer system.

Note: Other cure schedules are possible. Contact the GS Polymers Technical Staff to discuss your particular application.

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET (MSDS) PRIOR TO USING THIS PRODUCT.

NOTICE TO USER:

The following is made in lieu of all warranties, expressed or implied. Sellers and manufacturers only obligation shall be to replace such quantity of product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risks and liability whatsoever in connection therewith. The foregoing may not be altered except by an agreement signed by officers/owners of G.S. Polymers, Inc.

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