

SM 2004

SILICONE-MODIFIED EPOXY POTTING COMPOUND

Thermally Conductive, Heat-Resistant, Strong Adhesion, 85 Shore A Hardness

GENERAL DESCRIPTION

SM 2004 utilizes a novel hybrid chemistry producing a polymer with physical properties similar to both silicone and polyurethane. The system offers exceptional adhesion to metal and bonds to most substrates without need for primer.

Heat resistant, the cured system can withstand temperatures up to 150°C (302°F) and excursion as high as 176°C (~350°F) without losing elastomeric properties. Additionally, **SM 2004** is slightly thermally conductive which will help dissipate heat away from embedded electronic components. Well-suited for potting applications, the A and B components mix to form a low to medium viscosity fully flowable liquid with a generous 30-minute pot-life. The system can be handled after 2 hours of room temperature cure.

SM 2004 is an ideal candidate for general purpose elastomeric potting/encapsulant or sealant applications or other applications where silicone and polyurethanes are used. The compound offers greater heat resistance than most urethanes. And it offers better adhesion and physical properties than silicone without the cure-inhibition and migration issues common to silicone systems. **SM 2004** is particularly well-suited for applications where sensitive electronic components are subject to thermal cycling and need a stress accommodating polymer to absorb vibration or impact.

FEATURES

- Convenient mix ratio (1:1 parts by volume)
- 40 minute gel time
- Excellent shock absorption
- Moderate flexibility
- Excellent Adhesion
- Thermally Conductive

APPLICATIONS

- Printed circuit Boards
- Transformers
- Switches
- Miscellaneous electronics encapsulating

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

PROPERTY	PART A	PART B
Shelf Life	4 months	4 months
Density (lb/gal)	12.4	9.7
Viscosity (cps) @ 77° F	< 10,000	< 8,000
Color	Tan	Black

NOTICE TO USER

The following is made in lieu of all warranties, expressed or implied. It is the customer's responsibility to determine fitness of use for all GSP products by directly testing the materials first-hand for each application. Please fully evaluate the materials so as to convince yourself of appropriate and adequate performance. Before using, customer shall determine the suitability of the product for the intended use, and customer assumes all risks and liability whatsoever in connection therewith.

The only obligation of the seller or manufacturer 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. The foregoing may not be altered except by an agreement signed by officers/owners of G.S. Polymers, Inc.

Original: 10/29/2009 KZ; Revised: R3 KZ 11-15-2012 (replaces R2 BN 3/29/2012)

HANDLING PROPERTIES AT 77°F (25°C)

PROPERTY	SM 2004
Mix Ratio by Weight	100 A : 78 B
Mix Ratio by Volume	1 A: 1 B
Viscosity, mixed, cps	< 10,000
Gel Time	30-40 mins
Fixture cure	3-4 Hours
Cure Time	5-7 Days R.T.

PHYSICAL PROPERTIES at 77°F (25°C)

PROPERTY	VALUE
Hardness	75-85 Shore A
Color	Black
Elongation, %	200
Thermal conductivity, W/m.K (BTU-in/hr-Ft ² -°F)	0.242 (1.7)
Dielectric Constant, 1 mHz	4.0
Volume Resistivity, Ohm-cm	< 10 ¹⁵
Operating Temperature	-65°F – 350°F (-54 – 177°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 the mix static nozzle. Extrude material until ~2-3 cm (~1 inch) of material has extruded. 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** SM 2004 Part A to **1 part** SM 2004 Part B

Mix Ratio: Parts by Weight (pbw): **100 parts** SM 2004 Part A to **78 parts** SM 2004 Part B

Pot-Life: Do not mix more than can be applied in 20 minutes. Gel time is about 30-40 minutes but will vary depending on the mass mixed and the ambient temperature.

Proportion out components according to the parts by volume (pbv) or 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.

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.

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:

Full properties develop over a period of 5 to 7 days at ambient temperature. Cure may be accelerated with the application of heat. To heat cure the system, allow product to gel at room temperature for one hour. Then apply moderate heat 66-85 °C (150-185° F) for 3 to 5 hours.

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