

Information About **HIPEC® R-6101 Semiconductor Protective Coating**

HIPEC® R-6102 Semiconductor Protective Coating

Type

One-component solventless silicone elastomers

Physical Form

– As Supplied

Pourable liquid

– As Cured

Compliant elastomer

Color

R-6101, Clear

R-6102, Black

Special Properties

High purity, self-priming, high voltage insulation, protection from moisture and other environmental contaminants

Primary Uses

Protection of discrete devices such as transistors and rectifiers

DESCRIPTION

HIPEC® R-6101 Semiconductor Protective Coating and *HIPEC*® R-6102 Semiconductor Protective Coating are high purity, one-part, solventless silicone elastomers. They provide excellent self-priming adhesion to most device surfaces resulting in high-voltage isolation and moisture protection. These materials cure to a medium durometer elastomer in applications where a dry, non-tacky surface is desired.

HIPEC R-6101 is clear in thin film and slightly translucent in thick film. *HIPEC* R-6102 is black.

FEATURES

Significant features of *HIPEC* R-6101 and R-6102 Semiconductor Protective Coatings include:

- High purity
- Excellent self-priming adhesion to common electronic device and circuit substrates with superior moisture resistance
- Flexibility at high and low temperatures
- Excellent electrical properties over a wide operating temperature range
- Protection from moisture, dirt and other atmospheric contaminants
- Light transmission (R-6101)
- Blockage for light-sensitive devices (R-6102)

TYPICAL USES

HIPEC R-6101 and R-6102 Semiconductor Protective Coatings are well-suited for the protection of microelectronic devices. These materials are especially useful in applications involving the protection of discrete devices. This is due to their excellent adhesion, resulting in voltage isolation.

HOW TO USE

Recommended Cure Schedule

Cure is achieved via an addition reaction with the application of heat. No by-products of cure are given off. Recommended cure is 1 hour at 70°C, followed by 2 hours at 150°C for films greater than 10 mils. For films less than 10 mils, the 70°C cure can be eliminated in most cases.

Air circulating ovens exhausted to the outside should be used to prevent exhaust from re-circulating into the semiconductor production process area.

These one-part materials can be drop dispensed using conventional liquid dispensing methods.

If thinner films are desired, *HIPEC* R-6101 and R-6102 Semiconductor Protective Coatings can be diluted with *HIPEC*® Q2-1345 Diluent. (See MSDS and Product Information on *HIPEC* Q2-1345 Diluent, Form No. 10-688-96.)

Cure Inhibition

HIPEC R-6101 and R-6102

Semiconductor Protective Coatings may be susceptible to cure inhibition when in contact or contaminated by the following chemical materials. In order to avoid inhibition, all tools, equipment and substrates that come into contact with HIPEC R-6101 and R-6102 Semiconductor Protective Coatings should be cleaned or pre-tested to ensure that they are compatible and free of the following cure inhibitors:

- Sulfur and sulfur-containing compounds
- Phosphor and phosphorous-containing compounds
- Amines
- Organo tin compounds
- Plasticizers

LIMITATIONS

Not intended for medical use.

SHIPPING LIMITATIONS

None.

STORAGE AND SHELF LIFE

When stored in closed containers at or below -20°C, HIPEC R-6101 and R-6102 Semiconductor Protective Coatings have a shelf life of 9 -months from date of manufacture.

PACKAGING

HIPEC R-6101 Semiconductor Protective Coating is supplied in 1-lb and 2-oz containers.

HIPEC R-6102 Semiconductor Protective Coating is supplied in 1-lb and 8-lb containers.

TYPICAL PROPERTIES

These values are not intended for use in preparing specifications.

	HIPEC R-6101	HIPEC R-6102
Physical Properties – Uncured		
CTM ¹ 0176 Appearance	Clear	Black
Cure Mechanism	Addition	Addition
CTM 0005 Color, APHA	20	N/A
CTM 0050 Viscosity at 25°C, centipoise.	6200	4725
CTM 0045 Flash Point, °F	230	230
Physical Properties – Cured		
CTM 0044 Specific Gravity at 25°C	1.03	1.02
CTM 0208 Nonvolatile Content, percent	>99	>99
CTM 0526 Refractive Index	1.407	N/A
CTM 0099 Hardness, durometer A	29	27
CTM 0137A Tensile Strength, psi	230	264
CTM 0137A Elongation, percent	193	245
CTM 0137A Young's Modulus of Elasticity at 25°C, psi	190	149
CTM 0585 Coefficient of Linear Thermal Expansion in $\mu\text{m}/\text{m } ^\circ\text{C}$,		
Transition temperature, °C	-45	-45
Below transition temperature	95	95
Above transition temperature	345	313
CTM 0248 Water Absorption, percent weight gain after immersion 24 hours at room temperature	0.1	0.1
Electrical Properties – Cured		
CTM 0112 Dielectric Constant, at		
10 ² Hz	2.76	2.78
10 ⁵ Hz	2.76	2.78
CTM 0112 Dissipation Factor, at		
10 ² Hz	0.0005	0.0004
10 ⁵ Hz	<0.0002	<0.0002
CTM 0114 Dielectric Strength,		
Thickness, mils	67	67
Volts/mil	475	515
CTM 0249 Volume Resistivity,		
ohm-cm x 10 ¹⁵	1.4	1.5
Ionic Purity Levels		
CTM 0088 Na, ppm	<2	<2
CTM 0088 K, ppm	<2	<2
CTM 0088 Cl, ppm	<10	<10

¹CTMs (Corporate Test Methods) correspond to standard ASTM tests in most instances. Copies of CTMs are available upon request.

Specification Writers: Please obtain a copy of the Dow Corning Sales Specification for this product and use it as a basis for your specifications. It may be obtained from any Dow Corning Sales Office, or from Dow Corning Customer Service in Midland, MI. Call (517) 496-6000.

Figure 1: Differential Scanning Calorimetry of *HIPEC R-6101* Semiconductor Protective Coating

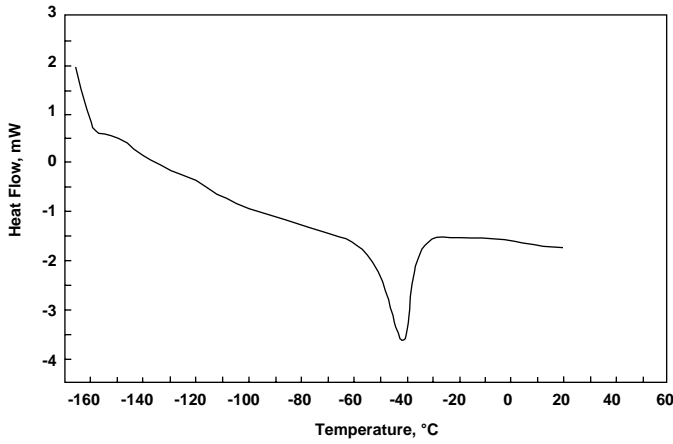


Figure 2: Differential Scanning Calorimetry of *HIPEC R-6102* Semiconductor Protective Coating

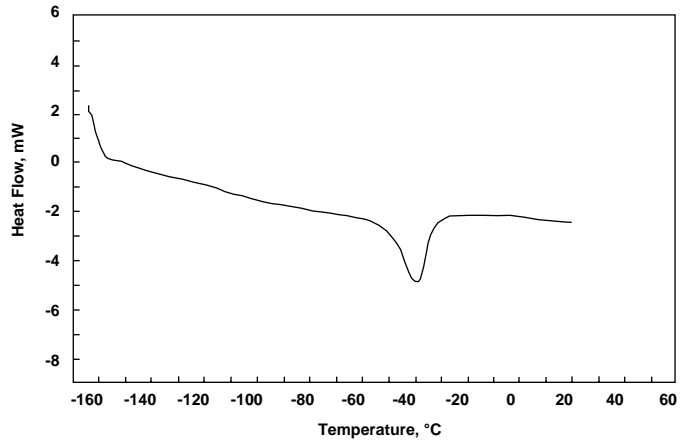


Figure 3: Dielectric Strength of *HIPEC R-6101* and *R-6102* Semiconductor Protective Coatings

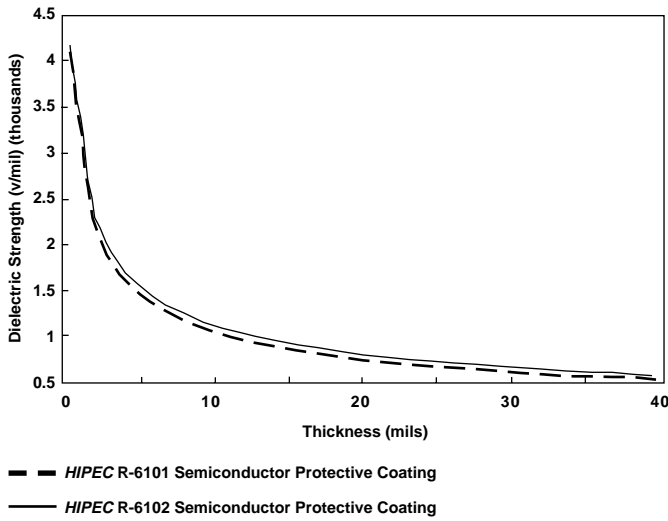


Figure 4: Thermal Stability Measured by TGA of *HIPEC R-6101* and *R-6102* Semiconductor Protective Coatings in Helium

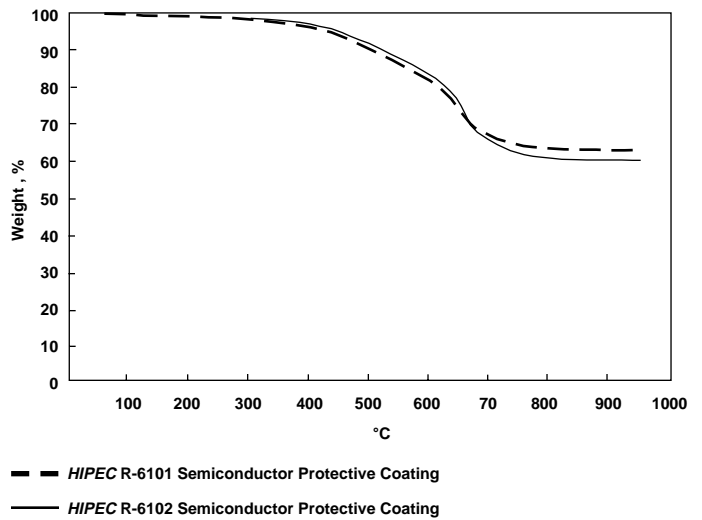
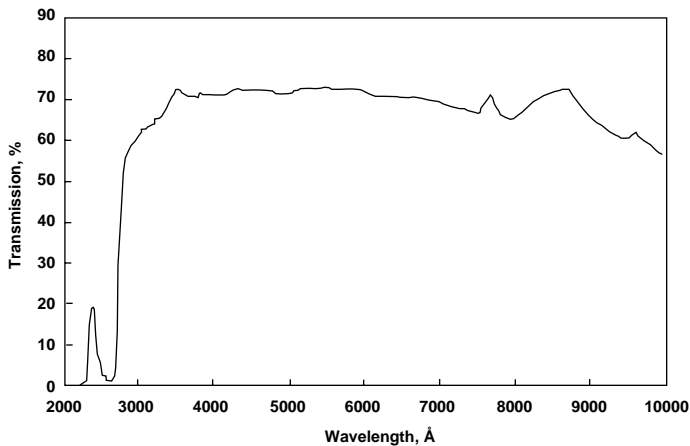


Figure 5: Light Transmission of *HIPEC R-6101* Semiconductor Protective Coating



SAFE HANDLING INFORMATION
PRODUCT SAFETY INFORMATION
REQUIRED FOR SAFE USE IS NOT
INCLUDED. BEFORE HANDLING,
READ PRODUCT AND MATERIAL
SAFETY DATA SHEETS AND CON-
TAINER LABELS FOR SAFE USE,
PHYSICAL AND HEALTH HAZARD
INFORMATION. THE MATERIAL
SAFETY DATA SHEET IS AVAILABLE
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