Information about *Dow Corning*® Brand Silicone Encapsulants

Silicones and Electronics

Long-term, reliable protection of sensitive circuits and components is becoming more important in many of today's delicate and demanding electronic applications. Silicone encapsulants provide unparalleled protection for electronic modules and devices ranging from relatively simple to highly complex architectures and geometries. Silicones function as durable dielectric insulation, as barriers against environmental contaminants, and as stress-relieving shock and vibration absorbers over a wide temperature and humidity range.

In addition to sustaining their physical and electrical properties over a broad range of operating conditions, silicones are resistant to ozone and ultraviolet degradation and have good chemical stability. The Dow Corning encapsulant family offers many choices to customize or tune product usage and performance for your specific application.

Two-Part Silicone Elastomers
Type Elastomers
Physical Form Two-part silicone elastomers
Special Properties Flowable liquid; cures to flexible elastomer; constant cure rate, regardless of sectional thickness or degree of confinement; service range of -45 to 200°C (-49 to 392°F); no post cure required; excellent dielectric properties; low modulus for superior stress relief; easy to rework and repair
Potential Uses Protection of electrical/electronic devices and components from harsh environments that can include high humidity and moisture, temperature extremes, thermal cycling stresses, mechanical shock and vibration dampening, mold, mildew, and dirt

DESCRIPTION

Dow Corning® silicone encapsulants or pottants are supplied as two-part liquid component kits comprised of:

Mix Ratio (by weight or volume)	Components (as supplied)
1:1	Part A/Part B
10:1	Base/Curing agent

When liquid components are thoroughly mixed, the mixture cures to a flexible elastomer, which is suited for the protection of electrical/electronic applications. *Dow Corning* silicone encapsulants cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement. *Dow Corning* silicone elastomers require no post cure and can be placed in service immediately following the completion of the cure schedule with an operating temperature range of -45 to 200°C (-49 to 392°F). Several products enable easy rework and repair. Select materials have been classified by Underwriters Laboratories and/or meet military specifications. Standard silicone encapsulants require a surface treatment with a primer in addition to good cleaning for adhesion while primerless silicone encapsulants require only good cleaning.

PRODUCT INFORMATION

Product	Description	Features
Silicone Encapsulants		
Sylgard® 160 Silicone Elastomer	2-part, 1:1 mix, dark gray, general purpose encapsulant with good flowability and flame resistance	1:1 mix ratio; good flowability; low cost for silicone benefits; room temperature or heat accelerated cure; moderate thermal conductivity; UL recognized
Sylgard® 164 Silicone Elastomer	2-part, 1:1 mix, gray, general purpose encapsulant with good flowability and flame resistance, faster cure at room temperature	1:1 mix ratio; good flowability; low cost for silicone benefits; rapid room temperature or heat accelerated cure; moderate thermal conductivity; UL V-0 flammability rating
Sylgard® 170 Silicone Elastomer	2-part, 1:1 mix, black, general purpose encapsulant with good flowability and flame resistance	1:1 mix ratio; low viscosity; low cost for silicone benefits; room temperature or heat accelerated cure; moderate thermal conductivity; moderate thermal conductivity; UL recognized; Mil Spec approved
Sylgard® 170 Fast Cure Silicone Elastomer	2-part, 1:1 mix, black, general purpose encapsulant with good flowability and flame resistance, faster cure at room temperature	1:1 mix ratio; low viscosity; low cost for silicone benefits; rapid room temperature or heat accelerated cure; moderate thermal conductivity; UL recognized
Sylgard® 182 Silicone Elastomer	2-part, 10:1 mix, transparent encapsulant with long pot life and good flame resistance	10:1 mix ratio; flowable; heat cure; high tensile strength; same as *Sylgard*® 184 Elastomer but with extended working time; UL V-1 flammability rating; Mil Spec approved
Sylgard® 184 Silicone Elastomer	2-part, 10:1 mix, transparent encapsulant with good flame resistance	10:1 mix ratio; flowable; room temperature or heat cure; high tensile strength; same as *Sylgard*® 182 Elastomer but with RT cure capability; UL recognized; Mil Spec approved
Sylgard® 186 Silicone Elastomer	2-part, 10:1 mix, translucent encapsulant with high tear strength	10:1 mix ratio; high viscosity; room temperature or heat cure; high tear strength; UL recognized
Dow Corning® 3-6121 Low Temperature Elastomer	2-part, 10:1 mix, translucent encapsulant with good strength and performance in low temperature extremes	10:1 mix ratio; flowable; heat cure; high tensile and tear strength; retains good properties at -65°C (-85°F); higher refractive index than typical dimethyl silicones
Dow Corning® 3-6512 A&B Elastomer	2-part, soft, transparent red, 1:1 mix ratio gel	Very long working time; soft elastomer; red
Dow Corning® 93-500 Thixotropic Kit	2-part, 10:1 mix, transparent space grade encapsulant	10:1 mix ratio; non-flowing; low levels of volatile condensable materials
Dow Corning® 93-500 Space Grade Encapsulant Kit	2-part, 10:1 mix, transparent space grade encapsulant	10:1 mix ratio; flowable; low levels of volatile condensable materials
Dow Corning® EE-1840 A&B	2-part, 1:1 mix, black encapsulant with room temperature self-priming adhesion and good flame resistance	1:1 mix ratio; flowable; self-priming at room temperature and heat cure; good cure rate at moderate temperatures; UL V-1 flammability rating
Sylgard® Q3-3600 A&B Thermally Conductive Encapsulant	2 part, 1:1 mix, rapid heat cure, self-priming adhesion and good flame resistance	1:1 mix ratio; long pot life; excellent flow; self-priming; thermally conductive; UL V-1 flammability rating
Dow Corning® SE 1815 CV Kit	2-part, 1:1 mix, reddish-brown heat curing encapsulant with controlled volatility and good flame resistance	1:1 mix ratio; flowable; self-priming; long working time at room temperature; heat cure; controlled silicone volatility; UL V-0 flammability rating

Product	Potential Uses	Application Methods	Cure[1,2]
Silicone Encapsulants			
Sylgard® 160 Silicone Elastomer	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, relays	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	24 hours at 25°C (77°F) 4 minutes at 100°C (212°F)
Sylgard® 164 Silicone Elastomer		Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing	35 minutes at 25°C (77°F)
Sylgard® 170 Silicone Elastomer		Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	24 hours at 25°C (77°F) 25 minutes at 70°C (158°F) 15 minutes at 85°C (185°F) 10 minutes at 100°C (212°F)
Sylgard® 170 Fast Cure Silicone Elastomer		Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing	10 minutes at 25°C (77°F)
Sylgard® 182 Silicone Elastomer	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, relays; adhesive/encapsulant for solar cells; adhesive handling beam lead integrated circuits during processing	Supplied as two-part liquid component kits comprised of Base/Curing Agent to be mixed in a 10:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	75 minutes at 100°C (212°F) 30 minutes at 125°C (257°F) 20 minutes at 150°C (302°F)
Sylgard® 184 Silicone Elastomer			>48 hours at room temperature 35 minutes at 100°C (212°F) 20 minutes at 125°C (257°F) 10 minutes at 150°C (302°F)
Sylgard® 186 Silicone Elastomer			48 hours at room temperature 25 minutes at 100°C (212°F) 15 minutes at 150°C (302°F)
Dow Corning® 3-6121 Low Temperature Elastomer	Low-temperature encapsulating applications; optical applications requiring high refractive index		>48 hours at room temperature 20 minutes at 100°C (212°F) 10 minutes at 150°C (302°F)
Dow Corning® 3-6512 A&B Elastomer	General potting applications where long working time for encapsulant is desireable to accommodate manufacturing processes or flow	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	2 hours at 70°C (158°F)
Dow Corning® 93-500 Thixotropic Kit	Applications where encapsulating or coating protruding components and/or solder joints, or for sealing electronics	Supplied as two-part liquid component kits comprised of Base/Curing Agent to be mixed in a 10:1 ratio by weight or volume; automated mixing and dispensing	24 hours at room temperature 7 minutes at 100°C (212°F) 4 minutes at 125°C (257°F) 3 minutes at 150°C (302°F)
Dow Corning® 93-500 Space Grade Encapsulant Kit	Potting or coating applications where extremely low volatility is required such as satellite or space applications, laser lens attach	Supplied as two-part liquid component kits comprised of Base/Curing Agent to be mixed in a 10:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	24 hours at room temperature 10 minutes at 100°C (212°F) 7 minutes at 125°C (257°F) 4 minutes at 150°C (302°F)
Dow Corning® EE-1840 A&B	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, solar cells	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	7 days at room temperature
Sylgard® Q3-3600 A&B Thermally Conductive Encapsulant	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, solar cells	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed 1:1 ratio by weight; automated mixing and dispense; manual mixing	1 hour at 100ºC (212ºF)
Dow Corning® SE 1815 CV Kit	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, solar cells	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed 1:1 ratio by weight; automated mixing and dispense; manual mixing	1 hour at 150°C (302°F)

[1]These data were collected on 50-100 gram samples of a lot believed to be typical and should be used as initial estimates of cure times. Times will vary slightly from batch to batch and can be longer or shorter due to thermal mass of your parts and your heating ramp rate. Pretesting is recommended to confirm adequate cure for your application.
[2]For primerless adhesion products, cure time is based on time to reach durometer. Full adhesion may take more time at the cure temperature.

Product	Description	Features
Dow Corning® SE 1816 CV Kit	2-part, 1:1 mix, black encapsulant with controlled volatility, good flame resistance and moderate thermal conductivity	1:1 mix ratio; flowable; self-priming; heat cure; good cure rate at moderate temperatures; long working time at room temperature; controlled silicone volatility; UL V-0 flammability rating
Dow Corning® SE 1740	2-part, 1:1 mix, clear encapsulant with long working time	1:1 mix ratio; flowable; self-priming; soft and transparent after cure; long working time at room temperature; heat cure; good cure rate at moderate temperatures
Primerless Silicone Encapsulants		
Dow Corning® 3-8264 Primerless Silicone Adhesive	2-part, 1:1 mix, black encapsulant	1:1 mix ratio; flowable; self-priming; heat cure; good cure rate at moderate temperatures
Dow Corning® 567 Primerless Silicone Encapsulant	2-part, 1:1 mix, black encapsulant with good flame resistance	1:1 mix ratio; flowable; self-priming; heat cure; UL recognized; Mil Spec approved
Dow Corning® 3-4207 Dielectric Tough Gel Kit	2-part, translucent green, 1:1 mix ratio, fast room temperature cure. Tough gel with UV indicator, conditional primerless adhesion and good flame resistance	Fast room temperature cure; two parts are blue and yellow and turn green when mixed; conditional primerless adhesion at room temperature; mechanical strength; UL 94 V-1 flammability rating; UV indicator for inspection. Under certain conditions in specific designs or applications, *Dow Corning*® 3-4207 Dielectric Tough Gel may lose adhesion; full environmental exposure testing is recommended.
Two-Part Room-Temperature Condensation-Cure Encapsulants		
Dow Corning® 255 Primerless Elastomer	2-part, 10:1 mix, dark gray flowable encapsulant with fast room temperature cure	10:1 mix ratio; flowable; fast room-temperature cure

Product	Potential Uses	Application Methods	Cure[1,2]
Dow Corning® SE 1816 CV Kit	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, solar cells	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed 1:1 ratio by weight; automated mixing and dispense; manual mixing	1 hour at 100°C (212°F)
Dow Corning® SE 1740	Optical potting applications: LED modules, solar cells	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed 1:1 ratio by weight; automated mixing and dispense; manual mixing	30 minutes at 80°C (176°F)
Primerless Silicone Encapsulants			
Dow Corning® 3-8264 Primerless Silicone Adhesive	Encapsulating applications requiring good primerless adhesion and lower heat cure temperatures	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated or manual mixing and dispensing can be used	150 minutes at 70°C (158°F) 30 minutes at 100°C (239°F)
Dow Corning® 567 Primerless Silicone Encapsulant	Low cost primerless adhesion encapsulation applications	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated or manual mixing and dispensing can be used	120 minutes at 100°C (212°F) 60 minutes at 125°C (257°F) 15 minutes at 150°C (302°F)
Dow Corning® 3-4207 Dielectric Tough Gel Kit	Encapsulating applications for various electronic devices, especially those requiring stronger adhesion or improved dimensional stability	Supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume; automated or manual mixing and dispensing can be used	1.5 hours at room temperature 10 minutes at 50°C (122°F) 3 minutes at 100°C (212°F)
Two-Part Room-Temperature Condensation-Cure Encapsulants			
Dow Corning® 255 Primerless Elastomer	General potting applications: power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs, relays	Supplied as two-part liquid component kits comprised of Base/Curing Agent to be mixed in a 10:1 ratio by weight or volume; automated mixing and dispensing; manual mixing	1.5 hours at room temperature 24 hours for adhesion

[1]These data were collected on 50-100 gram samples of a lot believed to be typical and should be used as initial estimates of cure times. Times will vary slightly from batch to batch and can be longer or shorter due to thermal mass of your parts and your heating ramp rate. Pretesting is recommended to confirm adequate cure for your application.
[2]For primerless adhesion products, cure time is based on time to reach durometer. Full adhesion may take more time at the cure temperature.

TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Product	Mix Ratio	Color	Viscosity, centipoise or mPa·s	Durometer, Shore A	Specific Gravity	Working Time at RT[1]	Unprimed Adhesion, Lap Shear			Thermal Conductivity		Linear Coefficient of Thermal Expansion, µm/m-°C or ppm	Shelf Life from Date of Manufacture at Room Temp, months
							psi	MPa	kgf/cm^2	Watt/meter-°K	cal/cm·sec °C		
Silicone Encapsulants													
Sylgard® 160 Silicone Elastomer	1:1	Gray	8775	56	1.57	25 min	NA	NA	NA	0.62	1.5 x 10^{-3}	200	18
Sylgard® 164 Silicone Elastomer	1:1	Gray	8925	61	1.57	14 min	NA	NA	NA	0.64	1.5 x 10^{-3}	200	15
Sylgard® 170 Silicone Elastomer	1:1	Dark gray to black	3400	40	1.38	15 min	NA	NA	NA	0.39	9.6 x 10^{-4}	275	24
Sylgard® 170 Fast Cure Silicone Elastomer	1:1	Dark gray to black	2850	45	1.38	4 min	NA	NA	NA	0.40	9.6 x 10^{-4}	—	18
Sylgard® 182 Silicone Elastomer	10:1	Trans-parent	4575	51	1.03	>8 hours	NA	NA	NA	0.16	3.8 x 10^{-4}	325	24
Sylgard® 184 Silicone Elastomer	10:1	Clear	4575	48	1.03	>2 hours	NA	NA	NA	0.16	3.8 x 10^{-4}	325	24
Sylgard® 186 Silicone Elastomer	10:1	Trans-lucent	66,700	24	1.12	4 hours	NA	NA	NA	0.21	4.8 x 10^{-4}	330	12
Dow Corning® 3-6121 Low Temperature Elastomer	10:1	Trans-lucent	19,250	34	1.12	>2 hours	NA	NA	NA	0.19	4.3 x 10^{-4}	300	18
Dow Corning® 3-6512 A&B Elastomer	1:1	Red	900	43	—	>24 hours	NA	NA	NA	—	—	—	24
Dow Corning® 93-500 Thixotropic Kit	10:1	Trans-lucent	Non-flow	62	1.08	160 min	NA	NA	NA	0.20	4.5 x 10^{-4}	300	12
Dow Corning® 93-500 Space Grade Encapsulant Kit	10:1	Trans-parent	8300	42	1.03	7.5 hours	NA	NA	NA	0.20	4.5 x 10^{-4}	300	12
Dow Corning® EE-1840 A&B	1:1	Black	1125	22	1.01	12 min	50	0.4	4	—	—	—	6
Sylgard® Q3-3600 A&B Thermally Conductive Encapsulant	1:1	Gray	4700	87	2.13	>24 hours	—	—	—	0.8	0.0018	—	6
Dow Corning® SE 1815 CV Kit	1:1	Red	2350	73	1.56	>8 hours	350	2.4	24	—	—	—	5
Dow Corning® SE 1816 CV Kit	1:1	Black	2700	39	1.36	>24 hours	220	1.5	15	0.73	0.0016	300	6
Dow Corning® SE 1740	1:1	Clear	925	35	1.0	>24 hours	30	0.2	2	—	—	—	12
Primerless Silicone Encapsulants													
Dow Corning® 3-8264 Primerless Silicone Adhesive	1:1	Black	3350	44	1.33	5 hours	420	2.9	29	0.35	8.4 x 10^{-4}	300	9
Dow Corning® 567 Primerless Silicone Encapsulant	1:1	Black	1540	42	1.23	>3 days	140	1.0	10	0.30	7.2 x 10^{-4}	300	24
Dow Corning® 3-4207 Dielectric Tough Gel Kit	1:1	Trans-lucent Green	425	59 (Shore 00)	0.97	10 min	—	—	—	0.15	3.6 x 10^{-4}	325	6
Two-Part Room-Temperature Condensation-Cure Encapsulants													
Dow Corning® 255 Primerless Elastomer	10:1	Gray to black	5800	30	1.3	12 min	50	0.3	3	0.24	5.9 x 10^{-4}	200	12

[1]Snap time.

Product	UL Listing		Military Specification		Dielectric Strength		Dielectric Constant at 100 Hz	Dielectric Constant at 100 kHz	Volume Resistivity, ohm-cm	Dissipation Factor at 100 Hz	Dissipation Factor at 100 kHz
	Flammability Classification	UL Temperature Index, Electrical/ Mechnical, °C	Specification	Type, Class, Group	volts/mil	kV/mm					
Silicone Encapsulants											
Sylgard® 160 Silicone Elastomer	94 V-0	105/105	NA	NA	475	19	3.51	3.45	5.6×10^{14}	0.0047	0.0012
Sylgard® 164 Silicone Elastomer	94 V-0	105/105	NA	NA	475	19	3.33	3.28	1.1×10^{13}	0.0078	0.0009
Sylgard® 170 Silicone Elastomer	94 V-0	170/170	MIL-PRF-23586F (Grade B2)	Type I, Class II, QPL	475	19	3.17	3.16	2.3×10^{13}	0.0027	0.0008
Sylgard® 170 Fast Cure Silicone Elastomer	94 V-0	170/170	NA	NA	350	14	3.53	3.45	2.4×10^{15}	0.0038	0.0008
Sylgard® 182 Silicone Elastomer	94 V-1	130/130	MIL-I-81550C	Type II, QPL	475	19	2.65	2.65	1.6×10^{15}	0.0005	0.0005
Sylgard® 184 Silicone Elastomer	94 V-1	130/130	MIL-I-81550C	Type I, QPL	350	14	2.72	2.68	2.9×10^{14}	0.0026	0.0013
Sylgard® 186 Silicone Elastomer	94 HB	140/140	NA	NA	450	18	2.70	2.68	5.0×10^{15}	0.00002	0.00006
Dow Corning® 3-6121 Low Temperature Elastomer	NA	NA	NA	NA	450	18	2.92	2.92	4.1×10^{14}	0.01	0.0008
Dow Corning® 3-6512 A&B Elastomer	NA	NA	NA	NA	525	21	—	—	4.3×10^{14}	—	—
Dow Corning® 93-500 Thixotropic Kit	NA	NA	NA	NA	450	18	2.8	2.8	6.2×10^{14}	0.0011	0.0002
Dow Corning® 93-500 Space Grade Encapsulant Kit	NA	NA	NA	NA	475	19	2.6	2.59	1.1×10^{15}	0.001	0.0002
Dow Corning® EE-1840 A&B	94 V-1	NA	NA	NA	425	17	—	—	3.2×10^{15}	—	—
Sylgard® Q3-3600 A&B Thermally Conductive Encapsulant	NA	NA	NA	NA	650	26	—	—	1.0×10^{15}	—	—
Dow Corning® SE 1815 CV Kit	94 V-0	NA	NA	NA	750	30	—	—	1.45×10^{15}	—	—
Dow Corning® SE 1816 CV Kit	94 V-0	NA	NA	NA	650	26	—	—	1.6×10^{15}	—	—
Dow Corning® SE 1740	NA	NA	NA	NA	425	17	—	—	1.14×10^{15}	—	—
Primerless Silicone Encapsulants											
Dow Corning® 3-8264 Primerless Silicone Adhesive	NA	NA	NA	NA	425	17	3.31	3.23	2.4×10^{14}	0.007	<0.001
Dow Corning® 567 Primerless Silicone Encapsulant	94 V-0	105/105	MIL-PRF-23586F (Grade B2)	Type I, Class IV, QPL	525	21	2.85	2.79	2.1×10^{15}	0.008	0.002
Dow Corning® 3-4207 Dielectric tough Gel Kit	94 V-1	NA	NA	NA	425	17	2.85	2.86	7.1×10^{13}	0.03	<0.0001
Two-Part Room-Temperature Condensation-Cure Encapsulants											
Dow Corning® 255 Primerless Elastomer	NA	NA	NA	NA	425	17	2.95	3.06	6.9×10^{14}	0.017	0.006

PRIMER SELECTION GUIDE

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on these products.

Product	Special Properties	Substrates	Compatible Silicones
Dow Corning® P5200 Adhesion Promoter – Clear	The most versatile of all Dow Corning primers for the widest range of silicones and electronics applications. This clear primer is similar to *Dow Corning*® 1200 OS Primer but uses a slightly different adhesion promoter combination. It enhances the adhesion of many RTV and heat-cure silicones to a wide variety of surfaces. Not registered for use in European Union.	Wide variety of surfaces including FR-4, ceramics, and many metals and plastics	All
Dow Corning® 1200 OS Primer Clear	The most versatile of all Dow Corning primers for the widest range of silicone types and electronics applications. This clear primer is supplied in a low-VOC diluent for lower environmental impact and exhibits low odor for convenient handling. It enhances the adhesion of many RTV and heat-cure silicones to a variety of surfaces. This primer is very similar to *Dow Corning* P5200 Adhesion Promoter and is registered for use in the European Union.	Wide variety of surfaces including FR-4, ceramics, and many metals and plastics	All
Dow Corning® P5204 Adhesion Promoter	This clear primer is supplied in a low-VOC diluent for lower environmental impact and exhibits low odor for convenient use. It is specially formulated to enhance adhesion of many moisture-cure RTV silicones to a wide variety of surfaces.	Wide variety of surfaces including FR-4, ceramics, and metals. Not recommended for plastics.	All
Dow Corning® 1201 RTV Prime Coat	This transparent primer with yellow tint is supplied in a mixture of acetone and toluene solvents. It is specifically formulated to enhance the adhesion of *Dow Corning*® 3110 and 3120 RTV Silicone Rubber to a wide variety of surfaces, especially FR-4 and metals.	Wide variety of surfaces, especially FR-4 and metals	*Dow Corning*® 3110, 3112, 3120 RTV Silicone Rubber
Dow Corning® 1205 Prime Coat	Specially formulated to increase adhesion of a wide range of silicones to plastics including more difficult types, such as acrylic and polycarbonate. This clear primer is supplied in a mixture of organic solvents.	Most plastics, ceramics, and composites	Not recommended for use with addition-cure silicones, such as *Sylgard*® 170, 184, 186 Silicone Elastomer Kit, etc.
Dow Corning® 92-023 Primer	Specially formulated for use with addition-cure silicones to mitigate surface cure poisoning. This clear primer is diluted in heptane solvent and enhances the adhesion of many addition-cure silicones to a wide variety of surfaces.	FR-4, most metals, and ceramics	Non-pigmented, two-part addition-cure silicones

MIXING – 1:1/PART A:PART B

Dow Corning silicone 1:1 encapsulants are supplied in two parts that do not require lot matching. The 1:1 mix ratio, by weight or volume, simplifies the proportioning process. To ensure uniform distribution of filler, Parts A and B must each be thoroughly mixed prior to their combination in a 1:1 ratio. When thoroughly blended, the Part A and B liquid mixture should have a uniform appearance. The presence of light-colored streaks or marbling indicates inadequate mixing and will result in incomplete cure.

Due to the fast-curing characteristics of some encapsulants included in this data sheet, automated mix and dispense equipment should be utilized. In applications sensitive to air entrapment, deairing with 28 to 30 inches Hg vacuum is required.

MIXING – 10:1/BASE:CURING AGENT

Dow Corning silicone 10:1 encapsulants are supplied in two parts as lot-matched base and curing agent that are mixed in a ratio of 10 parts base to one part curing agent, by weight. After thoroughly mixing base and curing agent, agitate gently to reduce the amount of air introduced. Allowing the mixture to set for 30 minutes before pouring may be adequate for removal of the air introduced during mixing. If air bubbles are still present, vacuum deairing may be required. Deair in a container with at least four times the liquid volume to allow for expansion of material. Air entrapped in the mixture can be removed by using a vacuum of 28 to 30 inches Hg. Continue the vacuum until the liquid expands and settles to its original volume and bubbling subsides. This may take 15 minutes to 2 hours depending on the amount of air introduced during stirring. For best curing results, glassware and glass or metal stirring implements should be used. Mix with a smooth action that does not introduce excess air.

POT LIFE/WORKING TIME

Cure reaction begins with the mixing process. Initially, cure is evidenced by a gradual increase in viscosity, followed by gelation and conversion to a solid elastomer. Pot life is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed. Please refer to individual pot life for each silicone encapsulant.

PROCESSING AND CURING

Thoroughly mixed *Dow Corning* silicone encapsulant may be poured/dispensed directly into the container in which it is to be cured. Care should be taken to minimize air entrapment. When practical, pouring/dispensing should be done under vacuum, particularly if the component being potted or encapsulated has many small voids. If this technique cannot be used, the unit should be evacuated after the silicone encapsulant has been poured/dispensed.

Dow Corning silicone encapsulants may be either room temperature (25°C/77°F) or heat cured. Room temperature cure encapsulants may also be heat accelerated for faster cure. Ideal cure conditions for each product are given in the product selection table. Two-part condensation cure encapsulants should not be heat accelerated above 60°C (140°F).

Dow Corning® 255 Curing Agent should be stirred prior to use because some settling may occur during shipping and storage. The curing agent is reactive with atmospheric moisture so care should be exercised to limit exposure to air prior to use.

PREPARING SURFACES

In applications requiring adhesion, priming will be required for the silicone encapsulants. See the Primer Selection Guide for the correct primer to use with a given product. For best results, the primer should be applied in a very thin, uniform coating and then wiped off after application. After application, it should be thoroughly air dried prior to application of the silicone elastomer. Additional instructions for primer usage can be found in the Dow Corning literature, "How To Use *Dow Corning* Primers and Adhesion Promoters" (Form No. 10-366) and in the information sheets specific to the individual primers.

USEFUL TEMPERATURE RANGES

For most uses, silicone elastomers should be operational over a temperature range of -45 to 200°C (-49 to 392°F) for long periods of time. However, at both the low and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations.

For low-temperature performance, thermal cycling to conditions such as -55°C (-67°F) may be possible, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. There are specialized products including *Dow Corning*® 3-6121 Low Temperature Elastomer that can perform at -65°C (-85°F) and below.

At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain usable.

COMPATIBILITY

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of *Dow Corning* silicone encapsulants. Most notable of these include:

- Organotin and other organometallic compounds
- Silicone rubber containing organotin catalyst
- Sulfur, polysulfides, polysulfones or other sulfur-containing materials
- Amines, urethanes or amine-containing materials
- Unsaturated hydrocarbon plasticizers
- Some solder flux residues

If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

Dow Corning 255 Elastomer is not subject to these inhibition concerns but may experience reversion in sealed applications at high temperature and pressure.

REPAIRABILITY

In the manufacture of electrical/electronic devices it is often desirable to salvage or reclaim damaged or defective units. With most non-silicone rigid potting/encapsulating materials, removal or entry is difficult or impossible without causing excessive damage to internal circuitry. *Dow Corning* silicone encapsulants can be selectively removed with relative ease, any repairs or changes accomplished, and the repaired area repotted in place with additional product.

To remove silicone elastomers, simply cut with a sharp blade or knife and tear and remove unwanted material from the area to be repaired. Sections of the adhered elastomer are best removed from substrates and circuitry by mechanical action such as scraping or rubbing and can be assisted by applying *Dow Corning*® brand OS Fluids.

Before applying additional encapsulant to a repaired device, roughen the exposed surfaces of the cured encapsulant with an abrasive paper and rinse with a suitable solvent. This will enhance adhesion and permit the repaired material to become an integral matrix with the existing encapsulant. Silicone prime coats are not recommended for adhering products to themselves.

HANDLING PRECAUTIONS

Dow Corning 255 Elastomer curing agent and uncured catalyzed material will burn skin and eyes upon prolonged contact. In case of eye contact, flush with copious amounts of water for at least 15 minutes and seek medical attention at once. Skin contact areas should be washed with soap and water. Persistent irritation should receive medical attention.

Use only with adequate ventilation; if not available, use respiratory protection.

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT WWW.DOWCORNING.COM, OR FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION.

USABLE LIFE AND STORAGE

Shelf life is indicated by the "Use By" date found on the product label.

For best results, Dow Corning silicone encapsulants should be stored at or below 25°C (77°F). Special precautions must be taken to prevent moisture from contacting these materials. Containers should be kept tightly closed and head or air space minimized. Partially filled containers should be purged with dry air or other gases, such as nitrogen.

Dow Corning 255 Elastomer should be kept refrigerated (10°C/50°F) until use. Any special storage and handling instructions will be printed on the product containers.

PACKAGING

In general, *Dow Corning* silicone 1:1 mix ratio encapsulants are supplied in nominal 0.45-, 3.6-, 18- and 200-kg (1-, 8-, 40- and 440-lb) containers, net weight. *Dow Corning* silicone 10:1 mix ratio encapsulants are supplied in nominal 0.5-, 5-, 25- and 225-kg (1.1-, 11-, 55- and 495-lb) containers, net weight. Packaging options may vary by product. Consult Dow Corning Customer Service at (989) 496-6000 for additional packaging options.

LIMITATIONS

These products are neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, www.dowcorning.com, or consult your local Dow Corning representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

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