

Information About *Dow Corning*[®] Brand Die Encapsulants

DESCRIPTION

Dow Corning[®] silicone encapsulants are designed to meet the key criteria for the micro- and optoelectronic packaging industry, including excellent adhesion, high purity, moisture resistance and thermal and electrical stability.

With their low Young's modulus, these materials can absorb the stress caused by CTE mismatches inside the package, protecting the chip and the bonding wires.

The electronics industry is steadily moving toward utilizing lead-free solders, and silicone encapsulants have demonstrated excellent stability at the required 260°C reflow temperatures. Optical-grade encapsulants deliver excellent light transmittance, so they can be used in optical devices such as photocouplers, light emitting diodes, contact image sensors, charge coupled devices and optical network units.

FEATURES/BENEFITS

- Excellent thermal stability for greater reliability
- Very low moisture uptake for greater reliability
- Low Young's modulus enables excellent stress absorption
- Excellent adhesion provides reliability, moisture resistance
- Very high purity reduces contamination potential
- Excellent optical properties for a broader range of applications
- Addition cure – no byproducts and minimal shrinkage

HOW TO USE

Dow Corning encapsulants are compatible with commercially available equipment and industry standard processes. The encapsulants can be dispensed, printed or liquid injection molded. Full cure to achieve final properties can be achieved in standard forced-air convection ovens or many other oven configurations.

Die Encapsulants

Type

Elastomer supplied as one- and two-part systems

Physical Form

Low-viscosity paste

Special Properties

Chemical adhesion; elastomeric silicone; moisture pickup <0.2%

Potential Uses

Seal, protect and preserve electrical characteristics of micro- and optoelectronic devices

Application

One-part materials can be dispensed through conventional equipment. Please contact your Dow Corning technical service representative for recommendations.

Dow Corning[®] brand OS Fluids are recommended to clean silicone residue from application equipment.

Removal

To enable failure analysis, *Dow Corning* electronic materials can be removed using *Dow Corning* OS Fluids or digestive stripping agents. Additional information regarding OS Fluids is available from Dow Corning.

COMPATIBILITY

The silicone products may be susceptible to cure inhibition when in contact or contaminated by the following chemical materials: sulfur and sulfur-containing compounds, phosphorous-containing compounds, amines, organotin compounds, unsaturated plasticizers, and some solder flux residues.

If a substrate or material is questionable with respect to compatibility, a small scale test should 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.

STORAGE AND SHELF LIFE

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

Check the product label for specific storage conditions (one-part products require cold storage).

One-part products produced in Japan for export are shipped using dry ice. One-part products produced in the United States are shipped using blue ice.

PACKAGING

Package size information is provided in the Product Information table.

LIMITATIONS

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

SHIPPING LIMITATIONS

Refrigerated shipping and storage are necessary.

SAFE HANDLING INFORMATION

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.

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.

DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

PRODUCT INFORMATION

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

Dow Corning® Brand Product	Description	Typical Applications	Packaging
6101	Semiconductor protective coating	LED	453-g bottle
6102	Semiconductor protective coating	DIP	453-g bottle
Q3-6633	Optical die coating	Photo coupler, LED	30-g syringe or 225-g bottle
Q3-6646	Optical die coating	Photo coupler, LED	900-g kit
Q1-4939	Optical die coating	Photo coupler, LED	900-g, 680-g, 540-g, 4000-g or 500-g kits
JCR6101	Semiconductor protective coating	LED	500-g bottle
JCR6146	Glob top for COB	Optical network unit	500-g bottle
JCR6160	Semiconductor protective coating	Power amplifier IC coating	500-g bottle
JCR6224	DRAM-grade encapsulant	Wire-bond BGA	200-g (6-oz syringe)
JCR6121	Semiconductor protective coating	TPH	500-g/30-g bottle
JCR6122	Semiconductor protective coating	LED, ASIC, image sensor	500-g/500-g bottle
JCR6125	Semiconductor protective coating	LCD driver, image sensor, THP	500-g/50-g bottle
JCR6126	Semiconductor protective coating	LED, image sensor, THP	500-g/50-g bottle
JCR6140	Semiconductor protective coating	CCD, ONU	500-g/500-g bottle
JCR6155	Semiconductor protective coating	TPH, image sensor	500-g/50-g bottle
JCR6159	Semiconductor protective coating	TPH	500-g/500-g bottle
JCR6109	Semiconductor protective coating	Photo coupler	500-g bottle
JCR6110	Semiconductor protective coating	Logic IC, pressure sensor	450-g/110-g bottle
6210	DRAM-grade encapsulant	Micro-BGA (memory)	500-g bottle
6820	DRAM-grade encapsulant	Wire-bond BGA	30-g syringe or 200-g Semco
6812	DRAM-grade encapsulant	Micro-BGA	30-g syringe or 200-g Semco
6811	DRAM-grade encapsulant	Micro-BGA	30-g syringe or 100-g or 160-g Semco
6810	Microelectronics-grade encapsulant	Micro-BGA	30-g syringe or 200-g Semco

TYPICAL PROPERTIES

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Dow Corning® Brand Product	One- or Two-Part	Mixing Ratio	Color	Viscosity/Flowability, poise	Durometer, Shore A	Penetration, mm	Specific Gravity	Working Time @ RT, hours	Cure Time @ 150°C, minutes	Young's Modulus, MPa	CTE, cm/cm-°C
6101	1	NA	Clear	62	28	NA	1.03	NA	4 hr @ 70°C + 2 hr @ 150°C	1.3	NA
6102	1	NA	Black	47	27	NA	1.02	NA	NA	1	315
Q3-6633	1	NA	Clear	28	34	NA	1.06	NA	NA	3.4	NA
Q3-6646	2	1:1	Clear	7	NA	55 1/10	0.97	16	60	varies	NA
Q1-4939	2	1:1, 2:1, 5:1, 8:1 or 10:1	Clear	49-58	28 at 1:1	55 1/10 @ 10:1	1.03	NA	120	varies	270
JCR6101	1	NA	Translucent	60	36	NA	1.04	NA	1 hr @ 70°C + 2 hr @ 150°C	1.2	300
JCR6146	1	NA	Black	150	80	NA	1.28	NA	60	9.8	220
JCR6160	1	NA	Translucent	63	25	NA	1.01	NA	60	0.69	320
JCR6224	1	NA	Black	2500	55	NA	1.42	NA	60	3	180
JCR6121	2	100/5	Translucent/ clear	24	20	NA	0.98	NA	60	0.59	320
JCR6122	2	100/100	Clear/clear	3.4	35	NA	0.97	NA	60	1.1	320
JCR6125	2	100/10	Translucent/ clear	90	23	NA	0.99	NA	60	0.66	310
JCR6126	2	100/10	Translucent/ clear	850	27	NA	1.03	NA	60	0.69	300
JCR6140	2	100/100	Clear/clear	32	40	NA	1.00	NA	60	0.98	320
JCR6155	2	100/10	Translucent/ clear	20	26	NA	0.97	NA	60	0.63	320
JCR6159	2	100/100	Translucent/ translucent	1250	53	NA	1.07	NA	60	2.5	300
JCR6109	1	NA	Translucent	39	NA	167 1/10	1.04	NA	1 hr @ 70°C + 16 hr @ 150°C	NA	NA
JCR6110	2	100/10	Clear/clear	21	NA	225 1/10	1.00	NA	60	NA	NA
6210	1	NA	Black	100	60	NA	1.2	24	60	3.5	230
6820	1	NA	Black	305	65	NA	1.39	48	30	2.6	207
6812	1	NA	Black	305	65	NA	1.39	48	30	2.6	207
6811	1	NA	Black	340	63	NA	1.25	24	60	2.7	250
6810	1	NA	Black	730	60	NA	1.32	6	30	2.8	270

Dow Corning® Brand Product	Dielectric Strength, kV/mm	Dielectric Constant	Volume Resistivity, ohm-cm	Dissipation Factor	Na Content, ppm	K Content, ppm	Cl Content, ppm	U Content, ppm	Th Content, ppm	Unprimed Adhesion, Lap Shear, MPa	Tensile, psi	Elongation, percent	Refractive Index
6101	18.7	2.8 @ 0.1 MHz	1.40E+15	0.0002 @ 0.1 MHz	<2	NA	<10	NA	NA	NA	260	240	1.407
6102	20.3	2.8 @ 0.1 MHz	1.50E+15	0.0002 @ 0.1 MHz	<2	NA	<10	NA	NA	NA	264	245	NA
Q3-6633	13.8	2.6 @ 0.1 MHz	3.00E+15	0.0001 @ 0.1 MHz	<2	NA	<5	NA	NA	0.5	290	255	1.447
Q3-6646	22.6	2.9 @ 0.1 MHz	3.70E+13	0.0001 @ 0.1 MHz	<2	NA	<5	NA	NA	NA	NA	NA	1.403
Q1-4939	18.5	2.7 @ 0.1 MHz	1.00E+15	0.0002 @ 0.1 MHz	<2	<2	<4	NA	NA	NA	1000	115	1.409
JCR6101	25	NA	2.90E+15	NA	≤2	≤2	NA	NA	NA	NA	NA	170	NA
JCR6146	34	NA	2.50E+15	NA	≤2	≤2	≤30	NA	NA	2.9	NA	70	NA
JCR6160	19	NA	4.90E+15	NA	≤2	≤2	NA	NA	NA	0.31	NA	NA	NA
JCR6224	27	3.1 @ 1 MHz	1.30E+16	0.0010 @ 1 MHz	≤2	≤2	≤10	≤1	≤1	1.7	NA	NA	NA
JCR6121	21	2.7 @ 1 MHz	2.00E+15	0.0004 @ 1 MHz	≤2	≤2	NA	NA	NA	0.22	NA	160	NA
JCR6122	23	2.7 @ 1 MHz	3.30E+15	0.0004 @ 1 MHz	≤2	≤2	≤10	NA	NA	NA	NA	NA	NA
JCR6125	24	2.6 @ 1 MHz	2.70E+14	0.0008 @ 1 MHz	≤2	≤2	≤10	NA	NA	0.39	NA	230	NA
JCR6126	24	2.8 @ 1 MHz	3.50E+14	0.0006 @ 1 MHz	≤2	≤2	≤10	NA	NA	0.95	NA	290	NA
JCR6140	31	2.8 @ 1 MHz	2.10E+14	0.0009 @ 1 MHz	≤2	≤2	NA	NA	NA	1.4	NA	175	NA
JCR6155	23	3.0 @ 1 MHz	2.20E+15	0.0003 @ 1 MHz	≤2	≤2	NA	NA	NA	NA	NA	180	NA
JCR6159	31	2.9 @ 1 MHz	3.30E+15	0.0008 @ 1 MHz	≤2	≤2	NA	NA	NA	NA	NA	NA	NA
JCR6109	18	2.8 @ 1 MHz	1.80E+15	0.0005 @ 1 MHz	≤2	≤2	≤10	NA	NA	NA	NA	NA	NA
JCR6110	15	2.8 @ 1 MHz	4.00E+14	0.0006 @ 1 MHz	≤1	≤1	≤2	NA	NA	NA	NA	NA	NA
6210	20	3.0 @ 1 MHz	1.00E+15	0.001 @ 1 MHz	<2	<2	<2	NA	NA	2.0	NA	NA	NA
6820	19.6	2.9 @ 0.1 MHz	1.80E+15	0.0002 @ 0.1 MHz	<1	<1	<2	NA	NA	NA	NA	NA	NA
6812	19.6	2.9 @ 0.1 MHz	1.80E+15	0.0002 @ 0.1 MHz	<1	<1	<2	NA	NA	3.9	NA	NA	NA
6811	19.7	2.8 @ 0.1 MHz	2.00E+15	0.0002 @ 0.1 MHz	<2	<2	<5	NA	NA	5.5	NA	NA	NA
6810	14.2	3.1 @ 0.1 MHz	9.70E+14	0.002 @ 0.1 MHz	<5	<5	<10	NA	NA	6.3	NA	NA	NA



Electronics
Solutions

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