

LIGHTING

Imagine a brighter future with material solutions for lighting

LED lighting product selection guide



Imagine A BRIGHTER **FUTURE**

Dow solutions for LED lighting

Silicone innovations for high-performance lighting

Your customers and end users demand brighter, more energy-efficient, more unique and longer-lasting lighting systems. You can meet that demand — and shape the future of lighting — with the right materials and the right help. Dow's innovative, high-performance silicone materials for protection and assembly and secondary optics — backed by a global network of lighting, technical, optical, and process experts — can help you imagine a brighter future.

Rely on the durable adhesion and protection from moisture, humidity, dirt, thermal, and physical damage you will get from Dow silicones for Protection & Assembly. They offer superior reliability and long lifetime performance, even in the most demanding applications.

Design entirely new ways to control the shape, color, and intensity of light with Dow Optical Silicones. They allow you to create optics in complex shapes with fine details and integrated mechanical features that may not be possible in traditional plastics.

The combination of innovative silicone protection and assembly and optical materials — and Dow's technical expertise — offers solutions that help you develop products that offer end users longer product life cycles and greater efficiency.

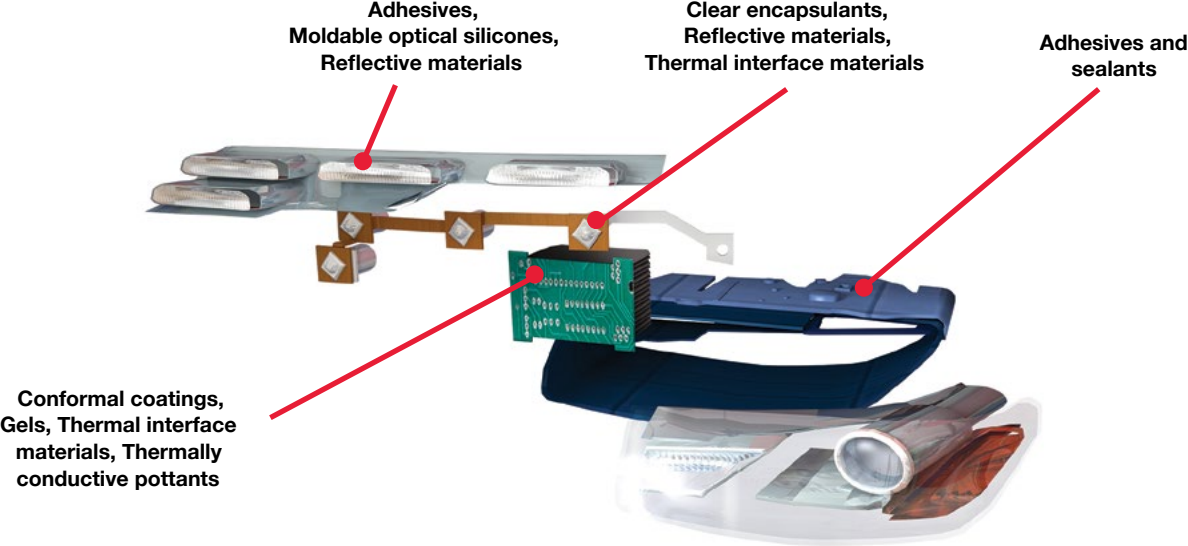
Protection and assembly

- Adhesives and sealants
- Clear encapsulants
- Coatings
- Gels
- Thermal pottants
- Thermal interface materials

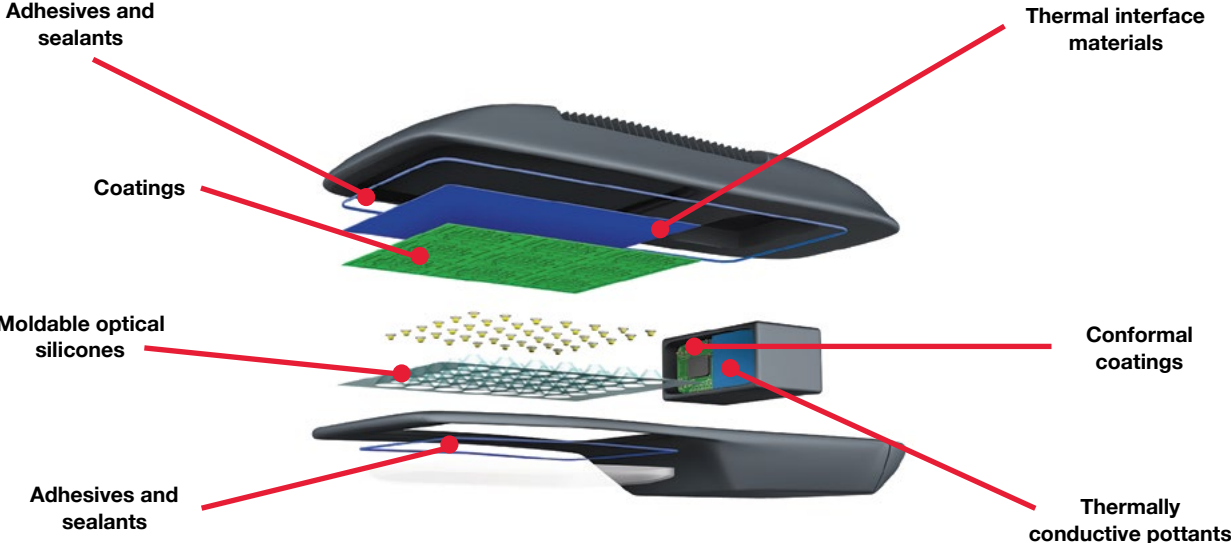
Optical silicones

- Moldable optical silicones
- Optical coupling materials
- Secondary optical encapsulants

LED headlamp assembly



LED luminaire assembly



enLIGHTen WITH **DOW SILICONES**

Solutions for lighting protection & assembly



No matter what the application, your design must remain intact and be protected from ultraviolet light, moisture, dust, corrosion, impact and vibration, operational heat, and environmental thermal extremes.

You can draw from Dow's decades of industry-leading experience in encapsulating, assembling, sealing, and providing thermal protection for sensitive devices in demanding applications, from implanted medical devices to aircraft instrumentation, and from transportation PCB assembly to solar energy systems. We can help you select the right material from the following time-tested, high-performing product portfolio.

- Adhesives and sealants
- Clear encapsulants
- Coatings
- Gels
- Thermal pottants
- Thermal interface materials

Together, Dow products and expertise can help you increase your design's functional lifespan and lower its cost of ownership.

Talk to one of our experts about Dow materials for LED applications — and find out how to make your idea even brighter.

Adhesives and sealants

By forming durable, low-stress elastomers, DOWSIL™ silicone adhesives and sealants provide you with excellent bonds and seals between a variety of common LED lighting materials. This increases your design flexibility while providing reliable long-term performance at temperatures up to 150°C. These one-part, solventless materials cure at room temperature to greatly simplify processing, and their low volatility helps your design maintain lumen output over its lifespan.

Product name	Color	Viscosity (cP)	Extrusion rate (g/m)	Specific gravity	Tack-free time 25°C (min)	Durometer (Shore A)	Tensile strength		Elongation (%)	Adhesion	Linear CTE (ppm/°C)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
							psi	MPa				Volts/mil	kV/mm		
DOWSIL™ 832 Multi-Surface Adhesive Sealant	Off-white	Non-slump paste	133	1.33	70	40	350	2.4	420	6.3 N/mm (Peel strength, Al)	—	—	—	—	UL 94 UL 746 UL 746C
DOWSIL™ 3140 RTV Coating	Translucent	34,400	N/A	1.05	116	32	434	3.0	419	7.0 N/mm (180° Peel strength)	325	385	15	2.10E+14	IPC Mil Spec UL 94 UL 746 UL 746C
DOWSIL™ 3165 Fast Tack RTV Adhesive Sealant	Gray	Non-flow	212	1.35	5	35	125	0.8	185	1.3 MPa (Lap shear, Al)	250	505	20	2.40E+15	UL 94 UL 746
DOWSIL™ 7091 Adhesive Sealant	White	Non-slump paste	208	1.4	28	32	363	2.5	680	—	—	400	16	1.00E+10	UL 94 UL 746 UL 746C
DOWSIL™ 3-1944 RTV Coating	Translucent	63,775	N/A	1.03	14	36	325	2.2	145	0.9 N/mm (180° Peel strength)	—	525	21	1.60E+15	IPC Mil Spec UL 94 UL 746
DOWSIL™ EA 2900 Sealant	White	N/A	190	1.52	20	50	304	2.1	400	1.5 MPa (Lap shear, Al)	—	434	17.1	1.02E+14	UL 94 UL 746
DOWSIL™ EA-3500G Fast-Cure Silicone Adhesive	White	Base: 119,000 Catalyst: 6,000	—	1.35	—	58	239	1.6	53	Unprimed: 0.9 MPa (Lap shear, Al/glass)	—	—	23	2.00E+16	—
DOWSIL™ EA-4900 White RTV Adhesive	White	N/A	1,900	1.7	5	73	530	3.6	31	1.1 MPa (Lap shear, Al)	—	—	625	1.00E+16	UL 94 UL 746
DOWSIL™ HM-2600 Silicone Assembly Sealant	Clear	180 Pa.s @ 100°C 70 Pa.s @ 120°C	N/A	1.08	N/A	60	>600	—	>1,200	1 MPa (Lap shear, Al)	235	—	24	1.00E+16	UL 94 HB
DOWSIL™ SE 9186 Sealant	Translucent	64,000	N/A	1.03	8	20	360	2.5	550	1.3 MPa (Lap shear, glass)	—	—	575	2.00E+16	—
DOWSIL™ SE 9187 L Adhesive	Translucent	1,100	N/A	1.00	8	17	65	0.4	160	0.3 MPa	—	500	20	3.00E+15	UL 94 UL 746
DOWSIL™ SE 9189 L RTV Adhesive	White or gray	23,300	N/A	1.18	8	33	320	1.9	235	1.2 MPa (Lap shear, glass)	—	625	25	9.00E+14	UL 94 V-0

Clear encapsulants



Protection and performance go hand-in-hand. Clear encapsulants from Dow help you balance both. In addition to moisture resistance, they absorb thermal cycling stress, protecting the sensitive components. Their high transmittance and thermal stability help your design maintain light quality over a longer time, while their unique chemistry offers minimal yellowing and degradation.

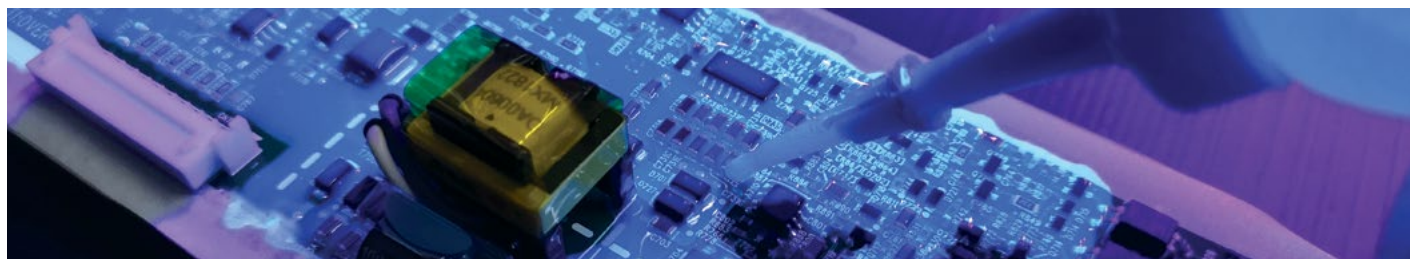
With a selection of cure profiles, viscosities, and hardnesses, you can explore new design options in a variety of applications. These two-part encapsulants expand processing options — from dispensing material to overmolded lens designs. They also provide moisture resistance, absorb thermal-cycling stress, and protect the sensitive components.

Product name	Mix ratio	Viscosity (cP)	Specific gravity (cured)	Cure time (min)	Working time at 25°C (Pot life)	Durometer (Shore A)	Gel hardness (g)	Tensile strength		Elongation (%)	Linear CTE (ppm/°C)	Light transmittance (%)	Refractive index (%)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
								psi	MPa					Volts/mil	kV/mm		
DOWSIL™ EG-4131 Dielectric Gel*	1:1	Part A: 750 Part B: 650 Mixed: 650	0.97	Tack-free time: 80 (25°C) <10 (50°C) <5 (100°C)	30 min	N/A	730	—	—	175	460	3.2 mm thickness 89.4 @ 380 nm 91.1 @ 450 nm 93.3 @ 760 nm	1.41 @ 633 nm	13.7	0.54	6.32E +13	—
DOWSIL™ EI-1184 Optical Encapsulant	1:1	Part A: 4,400 Part B: 3,500 Mixed: 5,300	1.04	4 hrs (25°C) 70 (50°C) ≤5 (100°C) ≤5 (150°C)	24 min	61	N/A	1,375	9.5	55	—	3.2 mm thickness 93 @ 380 nm 94 @ 450 nm 94 @ 760 nm	1.42 @ 633 nm	500	19	3.50E +16	UL 94 UL 746 UL 746C (f1)
DOWSIL™ EI-2888 Primerless Silicone Encapsulant	1:1	Part A: 2,000 Part B: 2,300 Mixed: 2,700	—	Gel time: 6 hrs (25°C)	—	10	—	29	0.2	190	482.6	5 mm thickness 91 @ 380 nm 94 @ 450 nm 95 @ 760 nm	1.41 @ 633 nm	482.6	19	1.00E +16	—
SYLGARD™ 182 Silicone Elastomer	10:1	Part A: 5,475 Part B: — Mixed: 4,575	1.03	14 days (25°C) 75 (100°C) 30 (125°C) 20 (150°C)	8 hrs	51	N/A	1,050	7.6	105	325	—	1.41 @ 633 nm	—	2.65	1.61E +15	UL 94 V-1
SYLGARD™ 184 Silicone Elastomer	10:1	Part A: 5,100 Part B: — Mixed: 3,500	1.03	2 days (25°C) 35 (100°C) 20 (125°C) 10 (150°C)	1.5 hrs	43	N/A	980	6.7	—	340	—	1.4118 @ 589 nm 1.4225 @ 632.8 nm 1.4028 @ 1321 nm 1.3997 @ 1554 nm	—	2.72	2.9E +14	UL 94 UL 746 UL 746C

*Available in United States and Asia

Coatings

The delicate PCB systems assemblies of your design need protection from humidity, moisture, and physical stress. DOWSIL™ one-part silicone conformal coatings can provide that protection — and deliver excellent insulation against shock and short circuits. You will also find them helpful for protecting circuitry in severe service environments, and they are available in a number of viscosities and cure chemistries.



Product name	Color	Viscosity (cP)	Specific gravity (uncured)	Specific gravity (cured)	Heat cure (min)	Tack-free time at 25°C (min)	Tack-free time at 60°C/15% RH (min)	Durometer	Tensile strength		Elongation (%)	Linear CTE (ppm/°C)		Dielectric strength		Volume resistivity (ohm*cm)	NVC (Nonvolatile content, %)	Agency listing
									psi	MPa		Volts/mil	kV/mm					
DOWSIL™ 1-2577 Conformal Coating	Transparent	950	1.04	1.11	2	7	1.3	80 (A)	—	—	—	—	400	16	5E+13	7.23	UL 94 V-0	
DOWSIL™ 1-2577 Low VOC Conformal Coating	Transparent	970	0.88	1.12	2	6	1.5	85 (A) 25 (D)	650	4.5	60	250	350	13	1.90E+14	37	IPC Mil Spec UL 94	
DOWSIL™ 1-2620 Low VOC Conformal Coating	Transparent	350	0.88	0.9	2	15	5	80 (A)	—	—	—	250	400	16	1.05E+15	31.3	IPC Mil Spec UL 746E	
DOWSIL™ 1-4105 Conformal Coating	Transparent	450	—	0.97	10	N/A	N/A	64 (00)	35	0.2	70	325	500	20	2.70E+13	98	UL 94	
DOWSIL™ 3-1944 RTV Coating	Transparent	63,775	—	1.03	N/A	14	0.5	36 (A)	325	2.2	145	—	525	21	1.60E+15	—	IPC Mil Spec UL 94 UL 746E	
DOWSIL™ 3-1953 Conformal Coating	Transparent	350	—	0.98	0.5	8	0.5	34 (A)	80	0.6	60	—	425	17	5.50E+15	99.4	IPC Mil Spec UL 94 UL 746	
DOWSIL™ 3140 RTV Coating	Translucent	34,400	—	1.05	N/A	116	—	32 (A)	434	3.0	419	325	385	15	2.10E+14	95.7	IPC Mil Spec UL 94 UL 746 UL 746C	
DOWSIL™ CC-2570 Conformal Coating	Transparent	1,000	1.04	1.11	2	7	1.3	76 (A)	—	—	—	—	—	—	—	72	UL 94 V-0	
DOWSIL™ CC-2571 Conformal Coating	Transparent	75	1.01	1.11	2	15	1.3	80 (A)	—	—	—	—	—	—	—	55	UL 94 V-0 UL 746E	
DOWSIL™ CC-3122 Conformal Coating	Transparent	80	—	1.03	N/A	6	—	75 (A)	—	—	—	—	813	32	2.30E+16	89 @ 105°C	—	

Gels

DOWSIL™ and SYLGARD™ gels offer you even greater design flexibility. Their softness and lower stress make them ideal for devices with sensitive components and fine-pitch wiring. These two-part materials retain much of the stress relief and self-healing qualities of a liquid while maintaining the dimensional stability of an elastomer. Gels cure in place to form a cushioning, self-healing, resilient material that provides stress relief, electrical insulation, and protection from moisture and other contaminants.

Product name	Color	Viscosity (cP)	Specific gravity (cured)	Cure time	Gel time at 25°C (min)	Working time at 25°C (min)	Durometer (Shore 00)	Gel hardness (g)	Penetration (1/10 mm)	Linear CTE (ppm/°C)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
											Volts/mil	kV/mm		
DOWSIL™ 3-4154 Dielectric Gel	Clear	Part A: 550 Part B: 525 Mixed: 550	0.97	3 hrs (80°C) 1.75 hrs (100°C)	—	30 (Pot life)	N/A	110	50	—	450	18	1.05E+15	—
DOWSIL™ 3-4207 Dielectric Tough Gel	Translucent green	Part A: 425 Part B: 525 Mixed: —	0.97	1.5 hr (25°C) 10 min (50°C) 3 min (100°C)	9.8	10 (Snap time)	59	N/A	N/A	—	420	17	7.10E+13	UL 94 UL 746 UL 746C
SYLGARD™ 527 Silicone Dielectric Gel	Colorless	Part A: 470 Part B: 454 Mixed: 465	0.95	3.5 hr (100°C) 1.25 hr (125°C) 35 min (150°C)	—	120 (Pot life)	N/A	113	—	335	425	17	2.75E+15	—



Thermal pottants



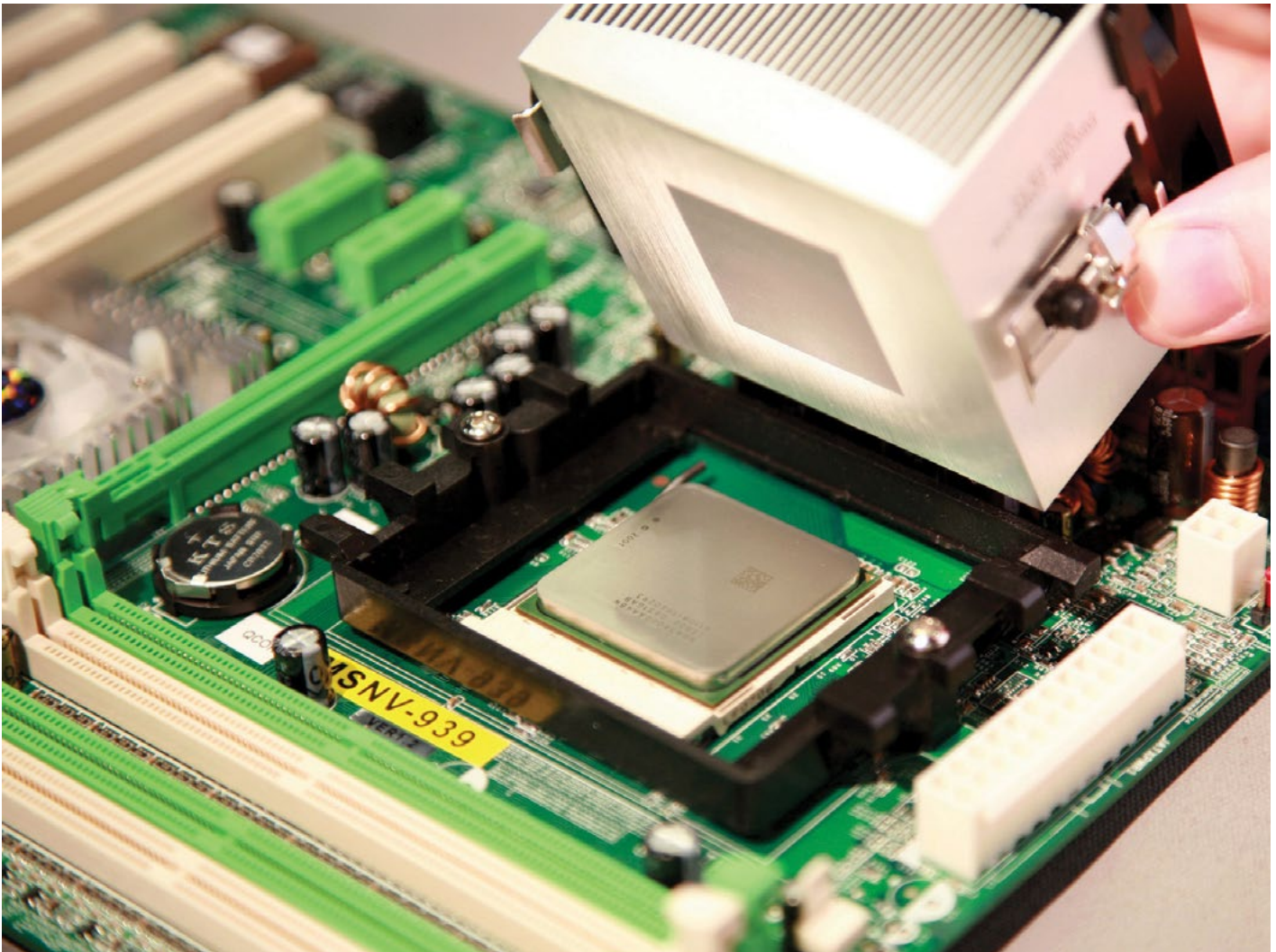
Environmental contamination and thermal damage to components can be two of the biggest threats to the long-term reliability of your LED lighting. DOWSIL™ and SYLGARD™ thermal silicone pottants protect LED drivers from moisture and dust, while dissipating heat and absorbing component noise.

Our two-part pottants feature a 1:1 mix ratio, and a room-temperature cure process that can be heat accelerated — offering you greater manufacturing flexibility. With high thermal conductivity, and the ability to withstand extreme temperatures and environmental conditions, these materials help you deliver designs that offer greater long-term reliability, and potentially lower lifetime cost.

Product name	Color	Viscosity (cP)	Specific gravity	Cure time	Working time at 25°C (min)	Durometer (Shore A)	Linear CTE (ppm/°C)	Thermal conductivity (W/mK)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
									Volts/mil	kV/mm		
DOWSIL™ CN-8760 Thermally Conductive Encapsulant*	Dark gray	Part A: 2,400 Part B: 2,397 Mixed: 2,850	1.60 (cured)	40 min (50°C)	120 (Pot life)	52	265	0.66	857	33	>10E+16	UL 94 UL 746
SYLGARD™ 160 Silicone Elastomer	Dark gray to black	Part A: 6,000 Part B: 3,730 Mixed: 4,865	A: 1.61 B: 1.60	24 hrs (25°C) 4 min (100°C)	20 (Pot life)	56	200	0.62	475	19	5.60E+14	UL 94 UL 746
SYLGARD™ 164 Silicone Elastomer	Gray	Part A: 8,925 Part B: 9,175 Mixed: —	A: 1.58 B: 1.57	36 min (25°C)	14 (Snap time)	61	225	0.64	475	19	1.10E+13	UL 94 UL 746
SYLGARD™ 170 Fast Cure Silicone Elastomer	Black	Part A: 2,650 Part B: 1,500 Mixed: 2,361	A: 1.38 B: 1.38	12 min (25°C)	<5 (Pot life)	43	—	0.40	350	14	2.42E+15	UL 94 UL 746
SYLGARD™ 170 Silicone Elastomer	Black	Part A: 3,160 Part B: 1,110 Mixed: 2,135	A: 1.37 B: 1.37	24 hrs (25°C) 25 min (70°C) 10 min (100°C)	15 (Pot life)	47	275	0.48	493	19.4	5.60E+17	Mil Spec UL 94 UL 746
SYLGARD™ 567 Primerless Silicone Encapsulant	Black	Part A: 2,060 Part B: 570 Mixed: —	1.24 (uncured)	2.5 hrs (70°C) 2 hrs (100°C) 15 min (150°C)	—	40	300	0.29	405	16	6.00E+16	Mil Spec UL 94 UL 746

*Available only in China

Thermal interface materials



Nothing will shorten the lifespan of your LED lighting more than heat ... and LEDs generate a lot of it. By designing with DOWSIL™ thermal interface materials, you have more heat management options.

The thermal stability of silicones offers long-lasting, consistent thermal conductivity — even at temperatures at which traditional materials might begin to degrade.

Thermal adhesives form thermally stable bonds to most LED PCB and heat sink substrates, and deliver excellent thermal conductivity. The low volatility of these one-part materials means no adverse impact on components or light output. And their sealing and adhesive qualities can allow you to minimize the number of components, and optimize the manufacturing process.

Thermal compounds offer high bulk conductivity and low thermal resistance. They are formulated to allow high loading of thermally-conductive fillers, and designed to achieve very thin bond line thicknesses.

Dispensable thermal pads allow you to quickly and precisely print thermally conductive silicone pads, in controllable thicknesses, on complex substrate shapes. They offer you enhanced thermal performance, and can accelerate production, and in many cases, reduce system costs.

Adhesives															
Product name	Color	Viscosity (cP)	Specific gravity	Heat-cure time (min)	Tack-free time 25°C (min)	Durometer (Shore A)	Tensile strength		Elongation (%)	Adhesion – lap shear (MPa)	Thermal conductivity	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
							psi	MPa				Volts/mil	kV/mm		
DOWSIL™ 1-4173 Thermally Conductive Adhesive	Gray	61,000	2.7	1.5 hrs (100°C) 30 min (125°C) 20 min (150°C)	—	92	900	6.2	22	4.5 (Al)	1.8	450	18	2.20E+14	UL 94 UL 746
DOWSIL™ 3-6752 Thermally Conductive Adhesive	Gray	83,000	2.61	40 min (100°C) 10 min (125°C) 3 min (150°C)	—	87	545	3.7	15	3.6 (Al)	1.69	400	16	7.10E+13	UL 94 UL 746
DOWSIL™ EA-9189 H RTV Adhesive*	White	—	1.68	—	2	80	576	4.0	32	2.2 (Al)	0.88	700	28	3.30E+15	UL 94 UL 746
DOWSIL™ SE 4485 Thermally Conductive Adhesive*	White	230,000	2.9	—	10	90	492	3.4	—	1.2 (Glass)	2.8	483	19	8.00E+14	UL 94 UL 746
DOWSIL™ SE 4486 Thermally Conductive Adhesive*	White	20,000	2.6	—	4	81	570	3.9	43	1.6 (Glass)	1.6	508	20	2.00E+14	—

*Cures at a rate of about 1/4 inch per seven days

Compounds and pads															
Product name	One- or two-part	Color	Viscosity (cP)	Specific gravity	Cure time at 25°C (hrs)	Heat-cure time (min)	Durometer (Shore 00)	Tensile strength		Elongation (%)	Thermal conductivity (w/mk)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
								psi	MPa			Volts/mil	kV/mm		
DOWSIL™ TC-4025 Dispensable Thermal Pad	Two-part (1:1)	Blue	70,000 (Mixed)	2.8	24	1hr, 25 min (40°C) 40 min (75°C) 15 min (100°C) 10 min (120°C)	50	24	0.3	200	—	2.5	18	3.90E+12	UL 94 UL 746
DOWSIL™ TC-5026 Thermally Conductive Compound	One-part	Gray	100,000	3.5 (uncured)	N/A	N/A	N/A	N/A	N/A	N/A	2.9	227	8.9	5.90E+11	—
DOWSIL™ TC-5080 Thermal Grease	One-part	White	836,000	2.1	N/A	N/A	N/A	N/A	N/A	N/A	1	220	8.7	2.90E+15	—
DOWSIL™ TC-5629 Thermally Conductive Compound	One-part	Gray	295,000	3.1	N/A	N/A	N/A	N/A	N/A	N/A	3.2	160	6.3	3.10E+13	UL 94 UL 746

Illuminating **INNOVATIONS**

Optical materials solutions for lighting



What most limits your design freedom? It is often the physical properties of your optical components. Now you can boost the performance of your design — and go beyond the limits of traditional optical materials. DOWSIL™ optical silicones not only offer excellent optical properties, they are more resistant to impact damage and degradation from UV, heat, and environmental extremes. They include:

- Moldable optical silicones
- Optical coupling materials
- Secondary optical encapsulants

As the pioneers of optical silicones, our portfolio of innovations enable more applications and even greater freedom in LED lighting design. When you pair the unique benefits of these materials with Dow's collaborative expertise, you will find new ways to help enhance the performance, durability, and reduce the total cost of ownership of your lamp and luminaire design. And the earlier in the design process you work with our experts, the more we can do — together — to enhance value and performance.

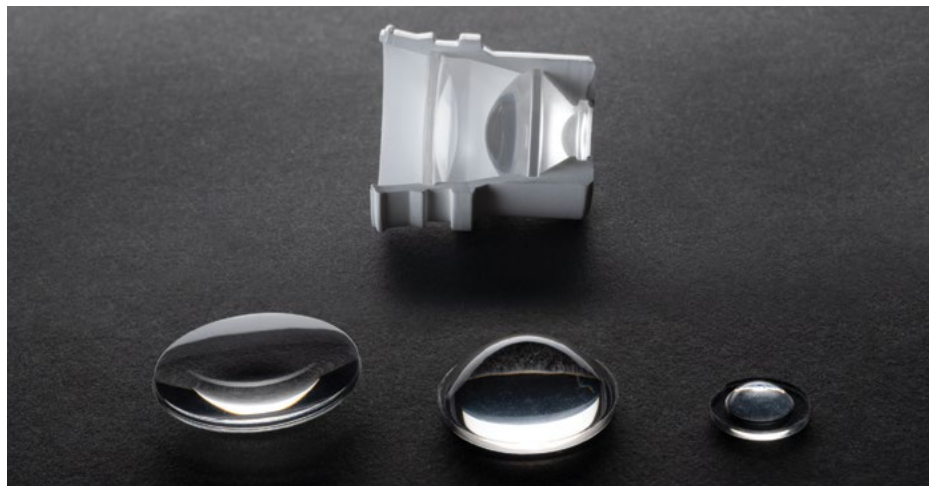
Discover new and innovative ways to control light. Create optics in complex shapes, or with fine details or integrated mechanical features not possible in traditional plastics.

Work with our support team to learn how optical silicones can enlighten your imagination.

Moldable optical silicones

You will find an unprecedented level of design freedom with moldable optical silicones from Dow. Versatile and moldable, these two-part* materials allow you to explore more complex designs — often while simplifying the manufacturing process.

They can also boost the long-term performance of your design beyond the capability of traditional optical materials. Not only do they offer excellent optical properties, they are more resistant to impact damage and degradation from UV, heat, and environmental extremes. This means your optics will remain physically and chemically stable while providing higher lumen densities. With moldable optical silicones from Dow, you can explore new design possibilities in challenging applications, such as automotive, retail, professional and consumer lighting, sports lighting, and outdoor displays.



Product name	Color	Viscosity (cP)	Working time at 25°C (Pot life, hrs)	Specific gravity (Kg/l)	Durometer	Tensile strength		Elongation (%)	Linear CTE (ppm/°C)	Light transmittance (% , 3.2 mm thickness)	Refractive index (633 nm, %)	Abbe number (a.i.)	Light reflectance (%)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
						psi	MPa							Volts/mil	kV/mm		
SILASTIC™ MS-0002 Moldable Silicone	Translucent	Part A:148,000 Part B:145,000 Mixed: —	48	—	65	1,300	—	270	280	75 @ 450 nm 89 @ 760 nm	—	—	N/A	500	19.7	—	UL 94 UL 746
SILASTIC™ MS-1002 Moldable Silicone	Optically clear	Part A: 40,000 Part B: 18,000 Mixed: 26,250	48	1.07	72	1,625	11.2	80	275	89 @ 380 nm 91 @ 450 nm 94 @ 760 nm	1.41	50	N/A	584	23	1.00E+18	UL 94 UL 746A UL 746C(f1)
SILASTIC™ MS-1003 Moldable Silicone	Optically clear	Part A: 52,000 Part B: 37,500 Mixed: 42,300	48	1.05	51	800	5.5	325	325	91 @ 380 nm 92 @ 450 nm 93 @ 760 nm	1.41	50	N/A	508	20	1.00E+16	UL 94 UL 746A UL 746C(f1)
SILASTIC™ MS-2002 Moldable Silicone White Reflector	White reflecting	Part A: 695,000 Part B: 565,000 Mixed: —	48	—	84	1,250	—	65	210	N/A	N/A	—	97 @ 450 nm 98 @ 555 nm 99 @ 630 nm	525	20.7	3.00E+15	UL 94 UL 746A UL 746C(f1)
SILASTIC™ MS-4002 Moldable Silicone	Optically clear	Part A: 50,000 Part B: 21,000 Mixed: 25,000	48	1.08	84	1,700	11.7	60	250	89 @ 380 nm 92 @ 450 nm 93 @ 760 nm	1.42	52	N/A	711	28	1.00E+14	UL 94 UL 746A UL 746C(f1)
SILASTIC™ MS-4007 Moldable Silicone	Optically clear	Part A: 28,000 Part B: 9,500 Mixed: 10,500	48	1.08	70	1,700	11.7	100	270	91 @ 380 nm 93 @ 450 nm 94 @ 760 nm	1.41	48	N/A	650	25.6	1.00E+14	UL 94 UL 746 UL 746(f1)
SILASTIC™ MS-4022 Moldable Silicone	Optically clear	Part A: 46,000 Part B: 16,000 Mixed: 19,000	48	1.08	85	1,600	11.0	52	245	87 @ 380 nm 90 @ 450 nm 93 @ 760 nm	1.42	52	N/A	660	26	1.00E+16	UL 94 UL 746A UL 746C(f1)

*Mix ratio 1:1

Note: All values indicated in the above table for cured materials are after one hour post-curing at 150°C

Optical coupling for displays

DOWSIL™ optical gels can be used as liquid, optically clear, coupling agents for display and LED lighting applications. These two-part* gels offer more processing flexibility, with the options of room-temperature cure (with no need for ovens or heat-accelerated cure), if faster processing is desired. These gels have been used extensively to seal and protect, by coating, encapsulating, or potting various optoelectronics due to their stress relieving capability and high refractive index, as well as the stability of these properties over time. Cured gels retain much of the stress relief and self-healing qualities of a liquid, while providing the dimensional stability of an elastomer — which is increasingly needed for delicate components.

Product name	Viscosity (cP)	Specific gravity (cured)	Cure time	Working time @ 25°C	Gel hardness (grams)	Linear CTE (ppm/°C)	Dielectric strength	
							Volts/mil	kV/mm
DOWSIL™ EG-1200 Gel	Part A: 1,480 Part B: 1,260 Mixed: 1,790	1.11	2 hrs @ 25°C 1 hr @ 32°C	Gel time: 20 min	51 Shore 00	—	—	—
DOWSIL™ EG-4131 Dielectric Gel	Part A: 750 Part B: 650 Mixed: 650	0.97	1 hr, 20 min @ 25°C ≤10 min @ 50°C ≤5 min @ 100°C	30 min	730	460	0.54	6.32E+13
DOWSIL™ VE-6001 UV Optical Bonding	3,600	1.11	UV cure condition >4,000 mJ/cm ² @ metal halide D-bulb and 365, 395, 405 nm UV LED	3 month pot life with no UV exposure condition	49 Shore 00	384	—	—

*Mix ratio 1:1

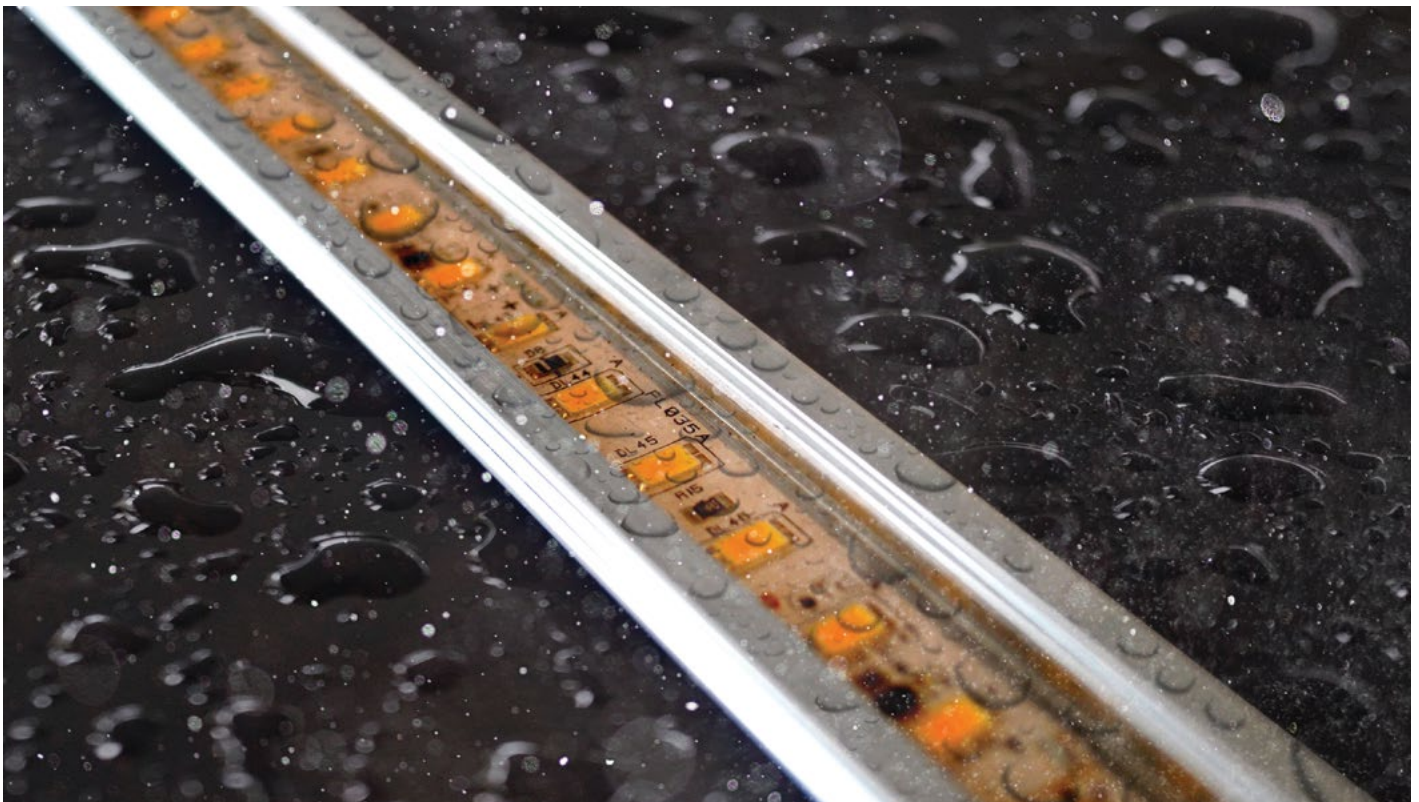


Secondary optical encapsulants

One way to realize greater cost efficiency, and lower total cost of ownership is through materials that can perform multiple functions. DOWSIL™ optical encapsulants offer you that opportunity. These two-part* materials provide superior protection from moisture, thermal stress, shock and impact, and offer excellent optical performance. You can count on minimal yellowing and degradation, while maintaining consistent light quality over the product lifespan.

Product name	Color	Viscosity (cP)	Specific gravity (cured)	Cure time	Working time at 25°C (Pot life, min)	Durometer (Shore A)	Tensile strength		Elongation (%)	Light transmittance (%)	Refractive index (%)	Dielectric strength		Volume resistivity (ohm*cm)	Agency listing
							psi	MPa				Volts/mil	kV/mm		
DOWSIL™ EI-1184 Optical Encapsulant	Clear	Part A: 4,400 Part B: 3,500 Mixed: 5,300	1.04	4 hrs (25°C) 70 min (50°C) ≤5 min (100°C) ≤5 min (150°C)	24	61	1,375	9.5	55	3.2 mm thickness 93 @ 380 nm 94 @ 450 nm 94 @ 760 nm	1.42 @ 633 nm	500	19	3.50E+16	UL 94 UL 746 UL 746C (f1)
DOWSIL™ EI-2888 Primerless Silicone Encapsulant	Clear	Part A: 2,000 Part B: 2,300 Mixed: 2,700	—	Gel time: 6 hrs (25°C)	—	10	29	0.2	190	5 mm thickness 91 @ 380 nm 94 @ 450 nm 95 @ 760 nm	1.4	482.6	19	1.00E+16	—

*Mix ratio 1:1





Learn more

We bring more than just an industry-leading portfolio of advanced silicone-based materials. As your dedicated innovation leader, we bring proven process and application expertise, a network of technical experts, a reliable global supply base, and world-class customer service.

To find out how we can support your applications, visit consumer.dow.com/lighting.



The Dow LED innovation ecosystem

With Dow as your collaborator, you can rely on our ongoing technical support as well as the expertise of Dow's advanced application centers. Yet we set the bar even higher for collaborative innovation: As an LED lighting customer, you will also gain the support of the Dow LED innovation ecosystem.

This broad and growing global network extends from Europe to Asia to the Americas and spans the entire LED value chain. It includes dozens of optical and LED component designers and manufacturers. This offers the expertise you need to develop a true total solutions package with such services as:

- Material development
- Analytical testing
- Optical design
- Application development
- Prototyping
- Process development

You will also gain the support of our extensive global network of equipment manufacturers, distributors, and specialty repackagers. Together, this array of resources and relationships offers you one of the most comprehensive sources for advanced materials solutions.

To learn how Dow can help you break through design and manufacturing barriers to become more innovative, competitive, and successful, contact your Dow representative.

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