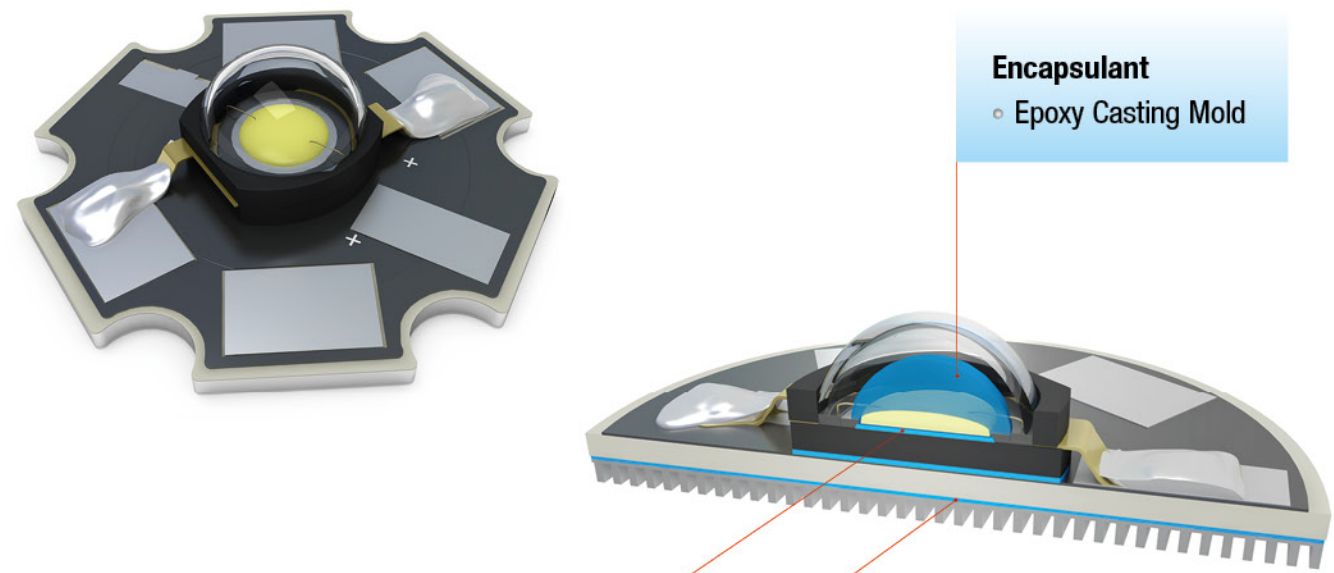


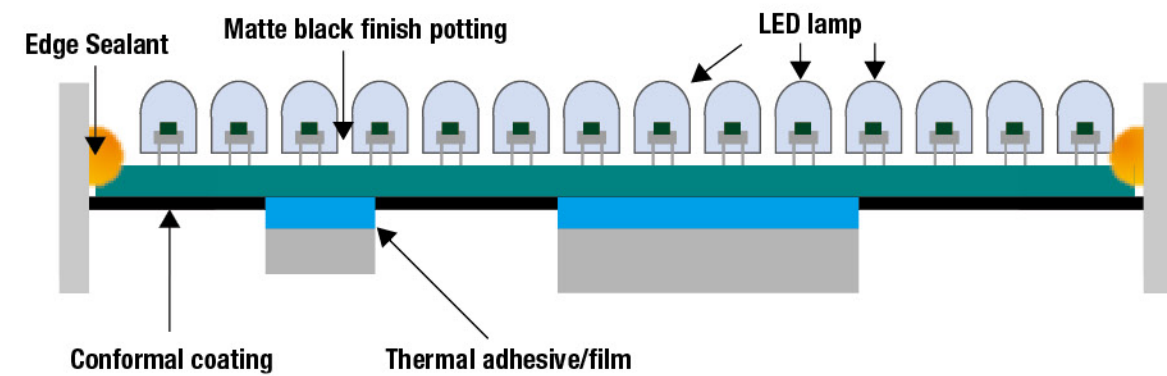
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Truly Integrated, Truly International



**Encapsulant**  
• Epoxy Casting Mold

**Die Attach**  
• Electrically Conductive Pastes  
• Non-Electrically Conductive Pastes  
• Thermally Conductive Pastes

**Thermal Interface Materials**  
• Non-Electrically Conductive Pastes  
• Thermally Conductive Pastes  
• PCM, Grease



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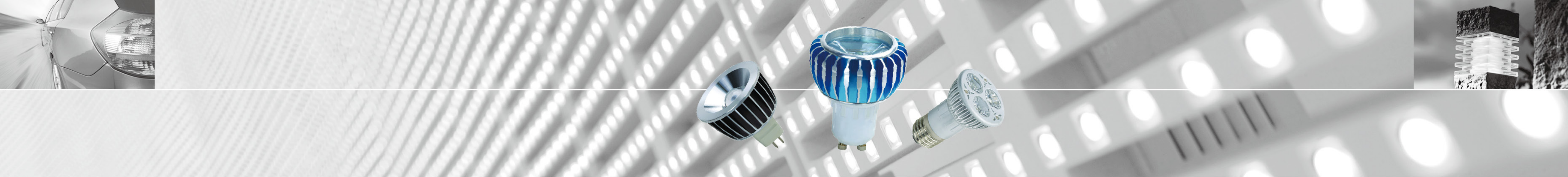
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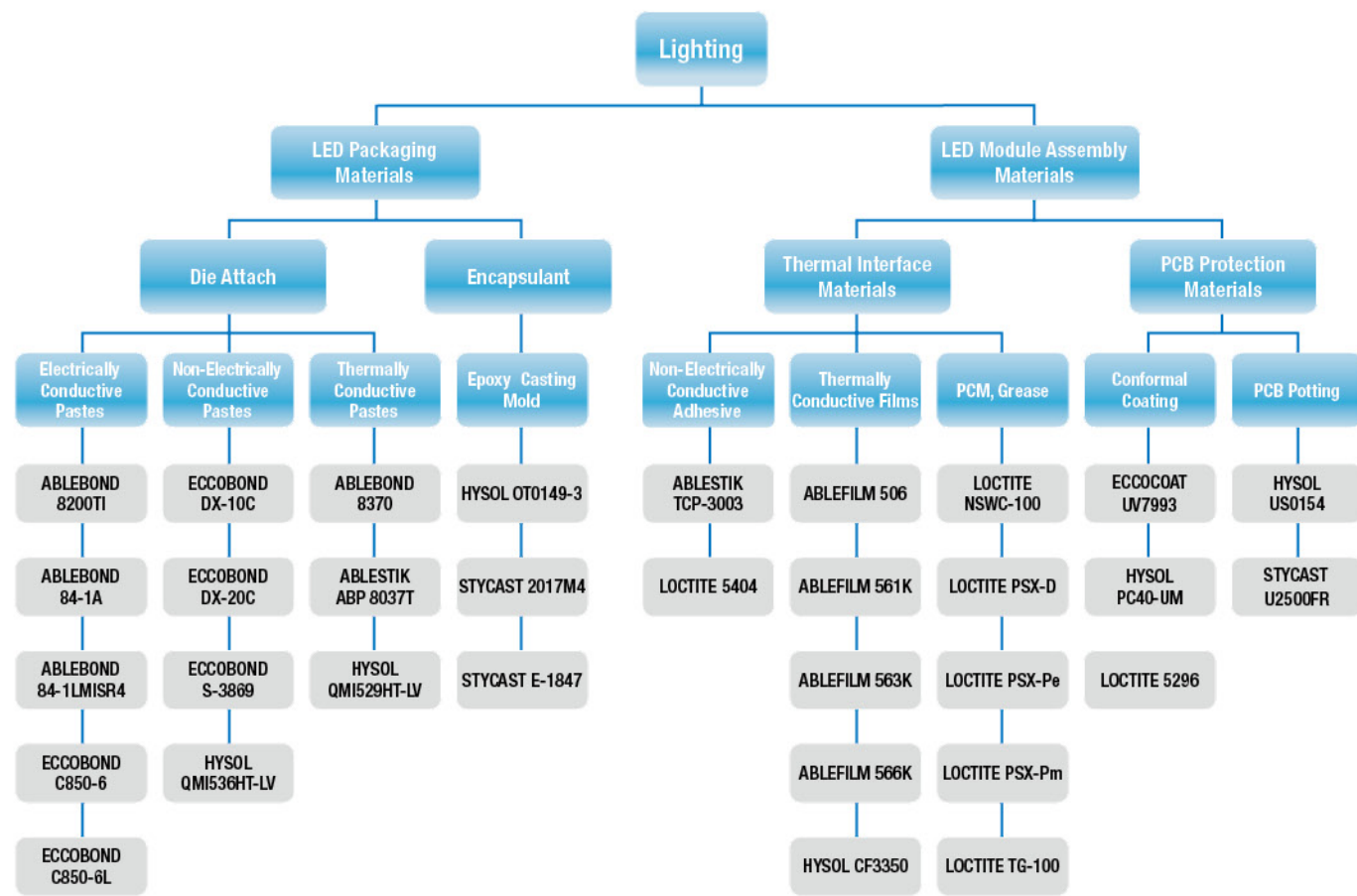
**Lighting Solutions**



**Henkel** Excellence is our Passion



Lighting advancements are one of the most promising areas of electronics market growth. In fact, by some estimates, the LED market is projected to grow at CAGR rates in the double digits over the next few years. Driven by the need for high brightness (HB) LEDs and the requirement to manufacture these even more efficiently, opportunities in the lighting market abound. Success, however, depends on partnering with the right material supplier who can deliver both LED assembly and protection solutions. With unmatched expertise in this market and now empowered by the integration of the well-respected Ablestik®, Hysol® and Loctite® brands, Henkel offers broad range of products to meet the increasingly demanding requirements of LED-based lighting assembly and protection. Our extended product line covers LED encapsulant, die attach, PCB protection and thermal management materials.



### LED Die Attach: Electrically Conductive Pastes

PRODUCT	DESCRIPTION	VISCOSITY, cPs (CP51, 5RPM)	COLOR	CURING SCHEDULE	TG, °C	POT LIFE @ 25°C, hrs	SHELF LIFE @ -40°C, months	VOLUME RESISTIVITY, Ohm.cm	THERMAL CONDUCTIVITY, W/mK
ABLEBOND 8200TI	Good adhesion strength to Au plated leadframe	8,800	Silver	30 minute ramp to 175°C + 15 minutes @ 175°C	83	24 hrs	12 @ -40°C	0.0005	3.5
ABLEBOND 84-1A	Standard type, Fast cure	18,000	Silver	10min @ 180°C	99	2 weeks	12	0.0002	1.9
ABLEBOND 84-1LMISR4	Standard type, Good dispensability	8,000	Silver	60min @ 175°C	120	18	12	0.0001	2.5
ECCOBOND C850-6	Strong hot adhesion and good anti-migration	100,000	Silver	30min @ 150°C	132	12	6 @ -20°C	0.00094	1.3
ECCOBOND C850-6L	C850-6 low viscosity version	80,000	Silver	60min @ 120°C	130	12	6 @ 0°C	0.00094	1.3

### LED Die Attach: Non-Electrically Conductive Pastes

PRODUCT	DESCRIPTION	VISCOSITY, cPs (CP51, 5RPM)	COLOR	CURING SCHEDULE	TG, °C	POT LIFE @ 25°C, hrs	SHELF LIFE @ -40°C, months	THERMAL CONDUCTIVITY, W/mK
ECCOBOND DX-10C	Epoxy base clear type, Low vis	3,000	Clear/Transparent	60min @ 140°C	116	24	6 @ -20°C	-
ECCOBOND DX-20C	Epoxy base, standard type non electrically conductive die attach	12,000, 10rpm	Translucent	60min @ 170°C	132	24	6 @ -20°C	-
ECCOBOND S-3869	Hybrid type with improved optical stability	4,200, 10rpm	White	120min @ 160°C	39	8	3	-
HYSOL QMI536HT-LV	Hydrophobic type, high temperature resistance, thermal conductive	13,000	-	15min @ 150°C	4	24	12	0.9

### LED Die Attach: Thermally Conductive Pastes

PRODUCT	DESCRIPTION	VISCOSITY, cPs (CP51, 5RPM)	THIXOTROPIC INDEX	COLOR	CURING SCHEDULE	TG, °C	SPECIFIC GRAVITY	POT LIFE @ 25°C, hrs	Shelf Life @ -40°C, months	ELECTRICAL CONDUCTIVITY	THERMAL CONDUCTIVITY, W/mK
ABLEBOND 8370	Gold filler, no silver migration	13,000	5.8	Gold Brown	60min @ 150°C	-	-	48	12	0.8x10 <sup>3</sup>	-
ABLESTIK ABP-8037T	Superior reliability	11,000	5.3	Silver	90min @ 150°C	110	4.8	24	6	0.3x10 <sup>4</sup>	4.7
HYSOL QMI529HT-LV	High thermal conductive	-	4.8	Silver	30min @ 185°C	3.3	4.1	24	12	0.5x10 <sup>4</sup>	6.5

### LED Encapsulant: Casting Mold

PRODUCT	DESCRIPTION	VISCOSITY, cPs (CP51, 5RPM)	COMPONENT	APPLICATION	CURING TIME	TG, °C	POT LIFE @ 25°C, hrs	SHELF LIFE, months	FLEXURE STRENGTH, Mpa
HYSOL OT0149-3	Clear glob top material with good adhesion to any substrate	70,000	1-Part	COB encapsulant	1hrs @ 90°C + 3hrs @ 120°C	150	> 3weeks	10 @ 0°C	-
STYCAST 2017M4	Epoxy encapsulant developed for lamp type, blue LED	730	2-Part	Blue LED, lamp type	45min @ 130°C + 2hrs @ 130°C	136	4	6 @ 25°C	119
STYCAST E1847	Epoxy encapsulant with excellent mechanical strength. Suitable for harsh environment such as outdoor and automotive	680	2-Part	Red, Yellow LED, lamp type	90min @ 110°C + 2hrs @ 140°C	135	4	6 @ 25°C	118

### Thermal Interface Materials: Non-Electrically Conductive Adhesive

PRODUCT	DESCRIPTION	CURING METHOD	CURING SCHEDULE	COLOR	SHELF LIFE, months	TENSILE STRENGTH, psi	THERMAL CONDUCTIVITY, W/mK
ABLESTIK TCP-3003	One-component Epoxy adhesive	Heat (Cure can be accelerated by infrared oven cure)	30min @ 150°C	Off-white	6months @ -25°C to -18°C	>7Mpa (on Al)	2.1
LOCTITE 5404	Silicone type	IR or Oven	10min @ 150°C	White to gray	-	>=1.3	>=0.95

### Thermal Interface Materials: Thermally Conductive Films

PRODUCT	DESCRIPTION	TENSILE STRENGTH, psi	THERMAL CONDUCTIVITY, W/mK	VOLUME RESISTIVITY, Ohm.cm	PRIMARY CURE CYCLE	STORAGE LIFE	FILM THICKNESS AVAILABLE, mils
ABLEFILM 506	A flexible film adhesive designed for bonding CTE mismatched materials. Slight tack can simplify assembly	1,200	0.9	7x10 <sup>12</sup>	1hrs @ 150°C	6months @ -40°C	4,5,6
ABLEFILM 561K	561K provides high adhesion strength with excellent flexibility for bonding mismatched CTE materials	3,300	0.9	9x10 <sup>12</sup>	30min @ 150°C	1year @ -40°C	4,5,6
ABLEFILM 563K	563K is an electrically insulating film with high thermal conductivity and adhesion strength. It is available either unsupported or with a fiberglass carrier	3,000	1	1x10 <sup>13</sup>	30min @ 150°C	1year @ -40°C	2,3,4,5,6
ABLEFILM 566K	566K offers low temperature cure in a thermally conductive adhesive with excellent flexibility and adhesion	2,200	0.8	1x10 <sup>13</sup>	2hrs @ 100°C	1year @ -40°C	4,5,6
HYSOL CF3350	High electrical conductivity and thermal conductivity, and flexibility film adhesive	-	7	0.2x10 <sup>13</sup>	30min @ 150°C	9months @ 5°C	2,4

### Thermal Interface Materials: Phase Change Material and Grease

PRODUCT	DESCRIPTION	COLOR	VISCOSITY, cPs	PHASE CHANGE TEMPERATURE, °C	THERMAL IMPEDANCE, @80 psi	THERMAL IMPEDANCE, @550 KPa	THERMAL CONDUCTIVITY, W/mK	SHELF LIFE, months
LOCTITE NSWC-100	Non-silicone, water cleanable thermal compound	White	0.042	-	0.0069	-	1.4	-
LOCTITE PSX-D	Dispensable, reworkable and repeatable phase change material, dispense type	Gray	60,000 (10rpm)	45	0.003	0.022	3.4	>6 @ RT
LOCTITE PSX-Pe	Extended dry phase change material	Grey	80,000 (10rpm)	45	-	-	3.4	>=6 @ 25°C
LOCTITE PSX-Pm	Reworkable and repeatable phase change material	Grey	70,000 (10rpm)	45	-	-	3.4	>=6 @ 25°C
LOCTITE TG-100	Ultra-high performance thermal grease	Grey	350,000	-	0.017	-	3.4	-

### PCB Protection Materials: Conformal Coating

PRODUCT	DESCRIPTION	RESIN TYPE	CURING SCHEDULE	VISCOSITY, cPs	DIELECTRIC STRENGTH, V/mil	SERVICE TEMPERATURE RANGE, °C
ECCOCOAT UV7993	UV and moisture cure, urethane base, good wettability to all substrate	Urethane Acrylate One-Component	5sec (UV)+ 4days @ RT	120	1,200	-40-105
HYSOL PC40-UM	Solvent-free, low-viscosity, rapid gel, UV-moisture cure, one-component conformal coating	Urethane Acrylate One-Component	10sec (UV)+ 3days @ RT	1,100	2,000	-40-135
LOCTITE 5296	1-component, heat cure, clear silicone conformal coating	Silicone One-Component	Heat 7min @ 125°C	200	524	-40-200

### PCB Protection Materials: PCB Potting

PRODUCT	DESCRIPTION	COLOR	COMPONENT	VISCOSITY, cPs	CURING SCHEDULE	HARDNESS	POT LIFE	SHELF LIFE
HYSOL US0154	Black, matte finish potting, UL94-V0	Black	2-Components	2,500 (as mixed)	16-24hrs @ RT or 4-6hrs @ 60-85°C	70 (Shore A)	200min @ 25°C	-
STYCAST U2500FR	Flexible, thermocycling resistant, UL94-V0	Black	2-Components	19,000 (as mixed)	24hrs @ RT or 4hrs @ 60°C	70 (Shore A)	-	6months @ 25°C