LOCTITE®
TECHNOMELT®

PRINTED CIRCUIT BOARD PROTECTION

Contents

Introduction

For today's electronics products, reliability is critical. Consumers expect unfailing function, uninterrupted long-term use and cost effectiveness. Manufacturing of complex electronic devices requires the highest quality materials to ensure robust performance and superb protection from harsh conditions and environmental influences.

Henkel's broad portfolio of printed circuit board protection materials safeguards electronic components and printed circuit boards (PCBs) from damaging environmental factors, such as extreme temperatures, fluids, corrosive elements, shock and vibration. Our advanced potting materials, sealants, low pressure molding systems and conformal coatings ensure that even the most complex circuitry is protected. With a wide range of materials for applications that span multiple markets, including automotive, industrial, medical and consumer electronics, Henkel's PCB protection materials deliver comprehensive solutions for a variety of products.

Sensors
- Acceleration
- Mass Air Flow
- Occupancy
- Position/Distance
- Speed/Rotation
- Temperature/Pressure

Safety/Security
- Air Bag Systems
- Alarm Systems
- Keyless Entry
- Seat Belt Systems
- Tire Pressure

Vision Systems
- Passenger Detection
- Pre-Crash Warning

Electronic Control Modules
- Air Bag Systems
- Braking Systems
- Energy Systems
- Fuel Pump Drive
- Fuse Boxes
- Heated Washers
- Transmission Systems
- Voltage Regulators

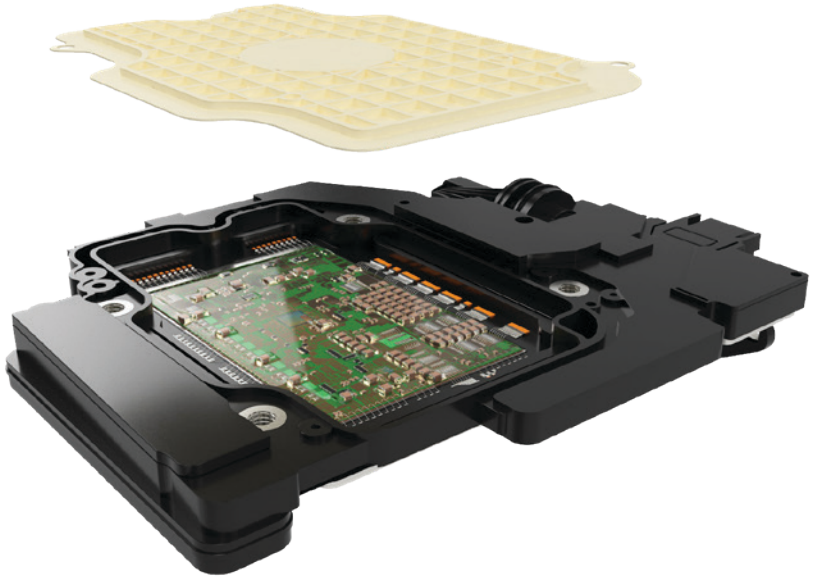
Cabin Devices
- A/V Systems
- Instrument Panels
- Navigation Systems
- Power Modules
- Seat Heaters

Electronic Lighting
- LED Systems

Automotive Electronics

Electronic devices used in automotive applications are constantly subjected to increasingly harsh conditions. Under-the-hood components risk damage from high temperatures. Elsewhere on the vehicle, contaminants from weather, road salts, oils and other automotive fluids can wreak havoc on sensitive and operation-critical electronics. Protecting electronic devices within automotive environments has been Henkel's passion for more than 20 years. Our unique formulations are found in automotive vision systems, electronic control modules, safety and security systems, sensors and lighting. With potting materials, conformal coatings, sealing and gasketing systems, and low pressure molding solutions, Henkel delivers protection where you need it most – under the hood and on the road.

APPLICATIONS	MATERIAL SOLUTIONS
PCB Assembly	• Conductive/Non-Conductive Pastes • Film Adhesives • SMT Bonding • Solder • Underfills
PCB Protection	• Conformal Coatings • Encapsulants • Low Pressure Molding Adhesives • Potting • Sealants



PRINTED CIRCUIT BOARD PROTECTION MARKET SOLUTIONS

AUTOMOTIVE

Electronic Control Unit (ECU)

Potting

- LOCTITE® SI 5140
- LOCTITE SI 5145
- LOCTITE STYCAST 2651-40
- LOCTITE STYCAST 2850FT
- LOCTITE STYCAST 2850KT

- LOCTITE STYCAST A 316-48
- LOCTITE STYCAST EO 1058
- LOCTITE STYCAST EO 7038
- LOCTITE STYCAST U 2500
- LOCTITE STYCAST US 1150
- LOCTITE STYCAST US 2651

Conformal Coatings

- LOCTITE SI 5092
- LOCTITE SI 5293
- LOCTITE STYCAST PC 40-UM
- LOCTITE STYCAST PC 40-UMF
- LOCTITE STYCAST UV 7993

Low Pressure Molding

- TECHNOMELT® PA 641
- TECHNOMELT PA 646
- TECHNOMELT PA 673
- TECHNOMELT PA 678
- TECHNOMELT PA 682
- TECHNOMELT PA 687

Sealants

- LOCTITE SI 5089
- LOCTITE SI 5210
- LOCTITE SI 5910

Sensors

Conformal Coatings

- LOCTITE STYCAST PC 40-UM
- LOCTITE STYCAST PC 40-UMF
- LOCTITE STYCAST PC 62
- LOCTITE STYCAST UV 7993

Low Pressure Molding

- TECHNOMELT PA 641
- TECHNOMELT PA 646
- TECHNOMELT PA 673
- TECHNOMELT PA 678
- TECHNOMELT PA 682
- TECHNOMELT PA 687

Lighting/Vision Systems

Potting

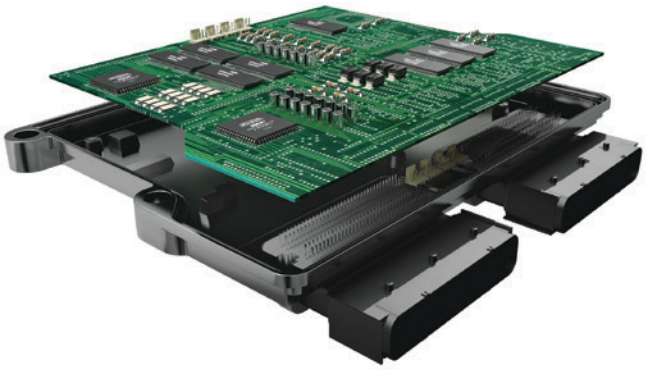
- LOCTITE STYCAST ES 1901
- LOCTITE STYCAST ES 2500
- LOCTITE STYCAST US 2050
- LOCTITE STYCAST US 2350

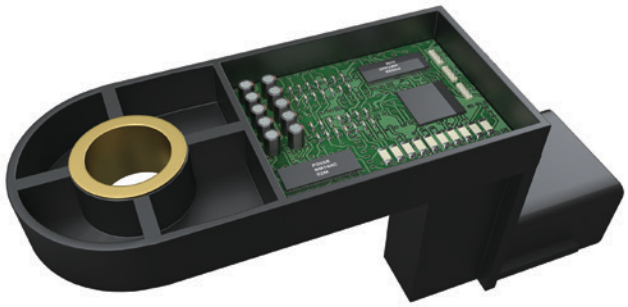
Ignition Coils

Potting

- LOCTITE STYCAST A 316-48
- LOCTITE STYCAST EO 1058
- LOCTITE STYCAST EO 7038
- LOCTITE STYCAST U 2500

Underhood





Consumer Electronics

Everyone who uses consumer electronics has one expectation in common: function without fail. Whether it's a washing machine, dishwasher, smartphone or tablet, immediate response and reliable operation is often taken for granted. Keeping our modern conveniences in good working order, however, takes the protection that Henkel's market-leading conformal coatings and encapsulation materials provide. Without these critical materials, the PCBs, which are arguably the foundation of all consumer electronics, would be nonresistant to corrosion, high temperatures, moisture, vibration and more. Henkel's nimbleness and formulation expertise address the dynamics of this market with material solutions that deliver real value. Consumers trust that the products they rely on will work on demand, and manufacturers of these products trust Henkel.

PRINTED CIRCUIT BOARD PROTECTION MARKET SOLUTIONS

WHITE GOODS

Control Boards (User Interface)

Potting

- LOCTITE® *STYCAST* 2651-40
- *LOCTITE STYCAST* ES 1000
- *LOCTITE STYCAST* ES 1900
- *LOCTITE STYCAST* ES 1902
- *LOCTITE STYCAST* US 2050

Sealants

- *LOCTITE* SI 5210

Conformal Coatings

- *LOCTITE STYCAST* PC 18M
- *LOCTITE STYCAST* PC 40-UM
- *LOCTITE STYCAST* PC 40-UMF
- *LOCTITE STYCAST* PC 62
- *LOCTITE STYCAST* UV 7993

Sensors (Load, weight, turbidity, moisture, temp.)

Potting

- *LOCTITE STYCAST* ES 1002
- *LOCTITE STYCAST* US 2050
- *LOCTITE STYCAST* US 2350

Low Pressure Molding

- TECHNOMELT® PA 6208 N
- TECHNOMELT® PA 6208 N BLACK
- *TECHNOMELT* PA 633
- TECHNOMELT® PA 638
- *TECHNOMELT* PA 652
- *TECHNOMELT* PA 657

HANDHELD

Moisture Seal

Conformal Coatings

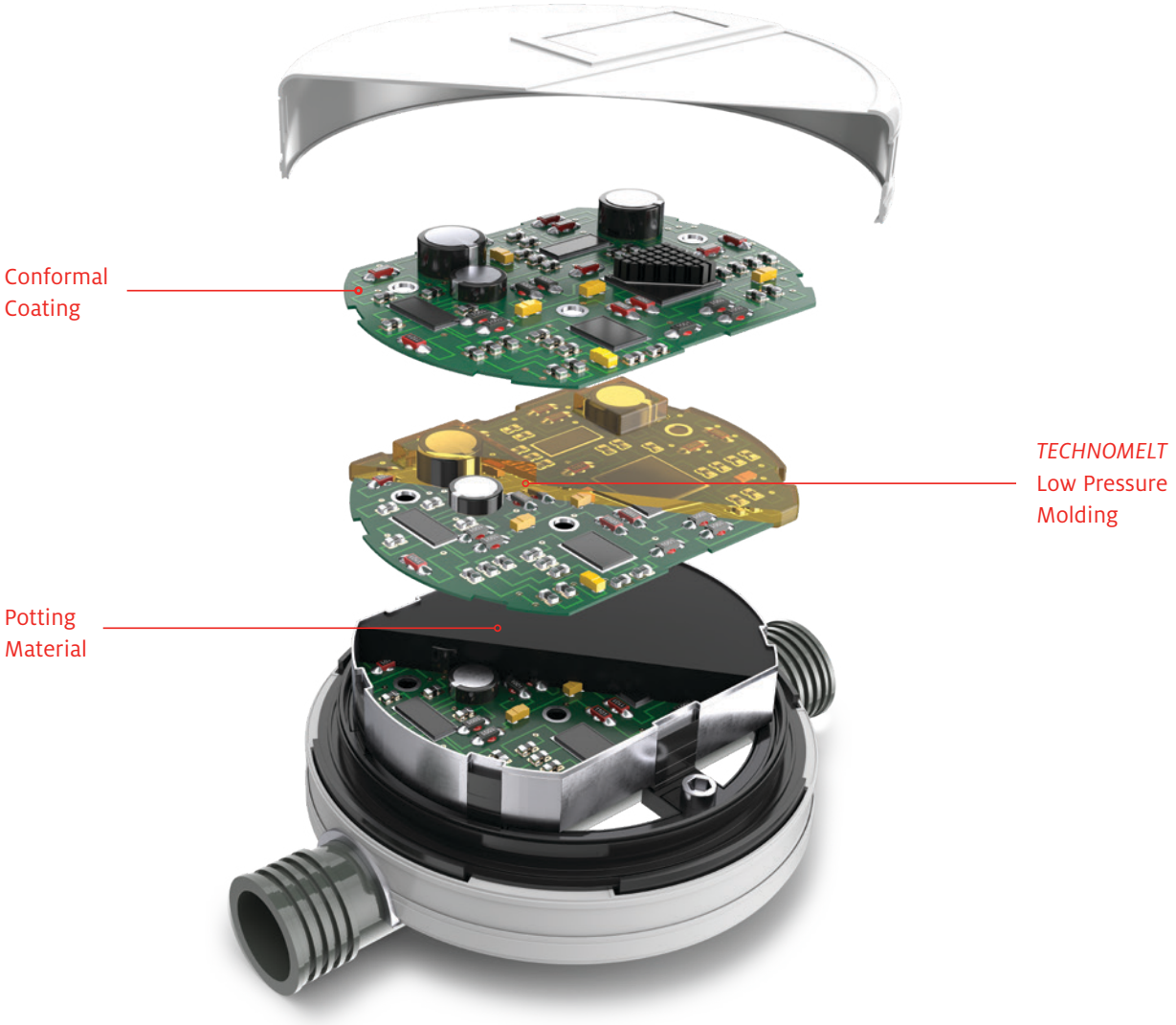
- *LOCTITE STYCAST* PC 40-UM
- *LOCTITE STYCAST* PC 40-UMF
- *LOCTITE STYCAST* PC 62
- *LOCTITE STYCAST* UV 7993

Low Pressure Molding

- *TECHNOMELT* PA 6208 N
- *TECHNOMELT* PA 6208 N BLACK
- *TECHNOMELT* PA 633
- *TECHNOMELT* PA 638
- *TECHNOMELT* PA 652
- *TECHNOMELT* PA 657

Industrial Electronic Components

Industrial electronics have to be rugged. They include applications like transformers, water meter sensors, industrial lighting and stadium lighting. Being able to withstand all types of weather conditions, extreme temperature swings and constant operation is par for the course for industrial electronics. Without protective materials, such as Henkel's conformal coatings, potting and low pressure molding compounds, however, the reliability of these important systems would be compromised. That's why the world's top industrial electronics manufacturing firms partner with Henkel for unfailing performance, exceptional reliability and in-field dependability.



PRINTED CIRCUIT BOARD PROTECTION MARKET SOLUTIONS

INDUSTRIAL ELECTRONIC COMPONENTS

Industrial Coils

Potting

- LOCTITE® *STYCAST* A 316-48
- *LOCTITE STYCAST* EO 1058
- *LOCTITE STYCAST* EO 7038
- *LOCTITE STYCAST* ES 1901
- *LOCTITE STYCAST* U 2500

Electronic Drivers

Potting

- *LOCTITE STYCAST* 2651MM
- *LOCTITE STYCAST* 2850FT
- *LOCTITE STYCAST* 2850KT

Conformal Coatings

- *LOCTITE STYCAST* PC 18M
- *LOCTITE STYCAST* PC 40-UM
- *LOCTITE STYCAST* PC 40-UMF
- *LOCTITE STYCAST* PC 62
- *LOCTITE STYCAST* UV 7993

Industrial Sensors

Potting

- *LOCTITE STYCAST* ES 2505
- *LOCTITE STYCAST* ES 2510
- *LOCTITE STYCAST* US 2350
- *LOCTITE STYCAST* US 2650
- *LOCTITE STYCAST* US 5544

Conformal Coatings

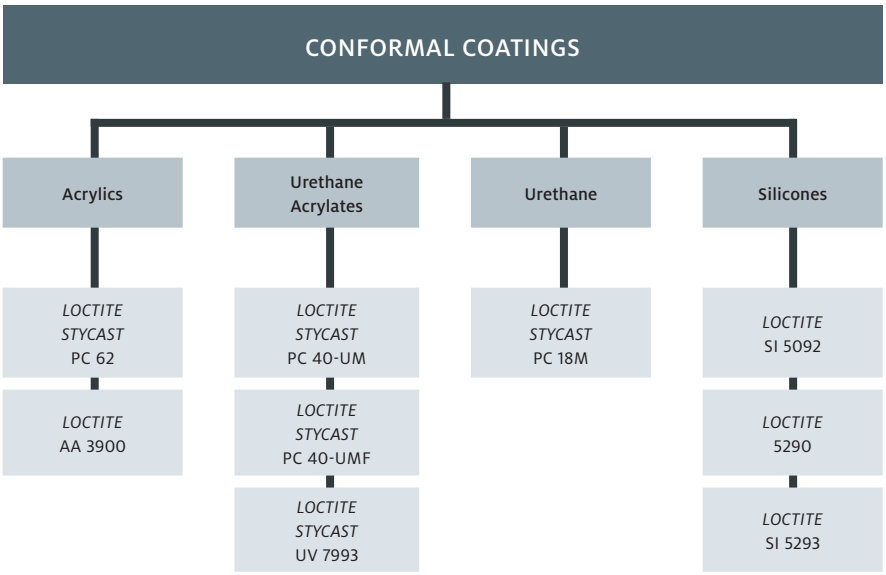
- *LOCTITE STYCAST* PC 18M
- *LOCTITE STYCAST* PC 40-UM
- *LOCTITE STYCAST* PC 40-UMF
- *LOCTITE STYCAST* PC 62
- *LOCTITE STYCAST* UV 7993

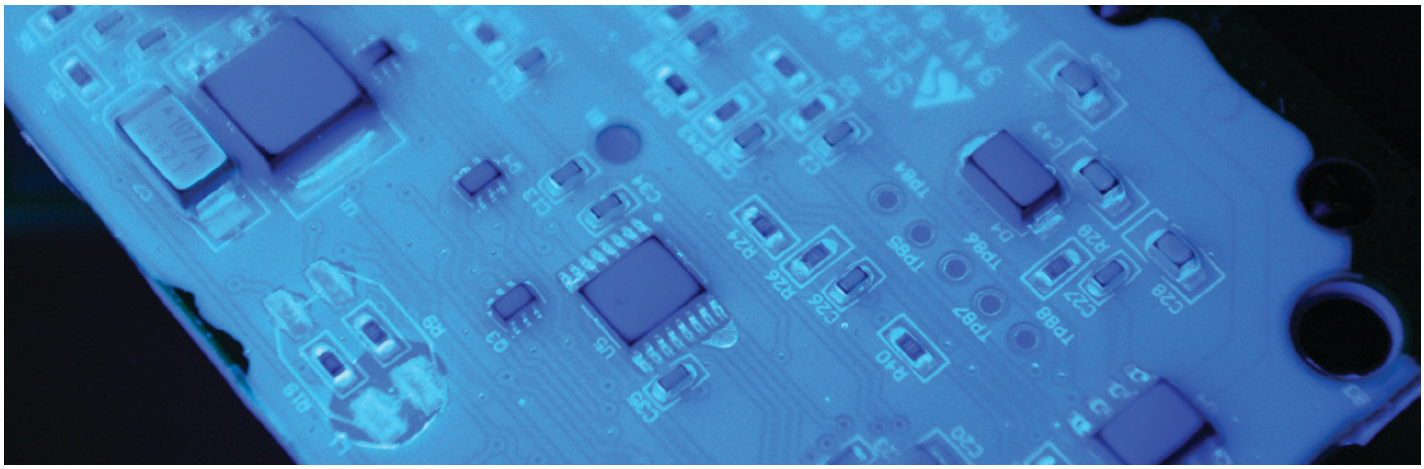
Low Pressure Molding

- TECHNOMELT® PA 6208 N
- *TECHNOMELT* PA 633
- *TECHNOMELT* PA 652
- *TECHNOMELT* PA 682
- *TECHNOMELT* PA 6208 N BLACK
- *TECHNOMELT* PA 638
- *TECHNOMELT* PA 657
- *TECHNOMELT* PA 687

Conformal Coatings

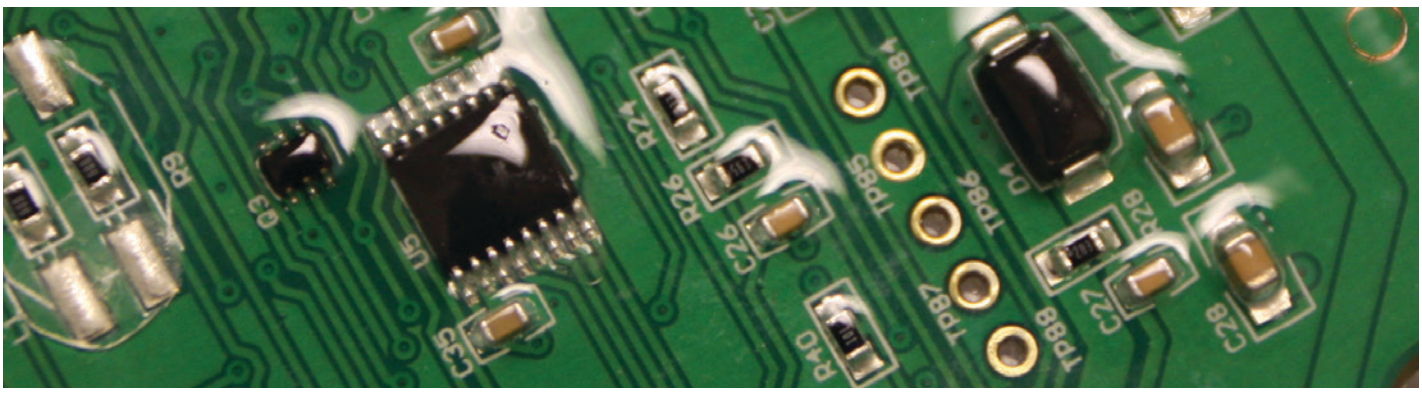
Henkel's advanced LOCTITE® brand of conformal coating materials protect PCBs and advanced substrates from thermal shock, moisture, corrosive liquids and other adverse environmental conditions. Shielding electronic function from external influences ensures long product life cycles for harsh marine, automotive, medical and consumer electronics applications. With exceptionally fast-cure capability and 100 percent solvent-free formulations, Henkel's conformal coatings provide fast processing and are environmentally responsible.





Conformal Coatings

PRODUCT	DESCRIPTION	CURE SCHEDULES	VISCOSITY mPa·S (cP)	OPERATING TEMPERATURE RANGE
ACRYLICS				
LOCTITE® *STYCAST* PC 62	Conformal coating that provides environmental and mechanical protection. Toluene-free alternative with superior toughness and abrasion resistance.	45 min. at 75°C	50	-40°C to 125°C
LOCTITE AA 3900	Aerosol, fast-cure, solvent-based acrylic coating. Designed for small product runs.	Air dry - 5 min.	N/A (Aerosol)	-40°C to 125°C
URETHANE ACRYLATES				
LOCTITE STYCAST PC 40-UM	One-component, solvent-free conformal coating that gels rapidly and cures with UV/moisture.	30 sec. UV + 3 days at RT	500	-40°C to 135°C
LOCTITE STYCAST PC 40-UMF	Conformal coating specifically formulated to rapidly gel and immobilize when exposed to UV light and then fully cure when exposed to atmospheric moisture, ensuring optimum performance even in shadowed areas.	10 sec. UV + 3 days at RT	250	-40°C to 135°C
LOCTITE STYCAST UV 7993	Conformal coating designed to provide rugged protection from moisture and harsh chemicals. It is compatible with industry-standard solder masks, no-clean fluxes, metalization, components and substrate materials.	10 sec. UV + 50 hours at > 70% RH	120	-40°C to 105°C
URETHANE				
LOCTITE STYCAST PC 18M	Flexible, one-component, solvent-based urethane coating that may be cured at room temperature.	2 hrs. at 60°C w/ 30-50% RH	350	-40°C to 110°C
SILICONES				
LOCTITE SI 5092	Noncorrosive, UV/moisture-cure silicone for shallow potting, coating and sealing of electronic assemblies. High adhesion to difficult-to-bond substrates.	60 sec. UV + 3 days at RT	5,800	-40°C to 200°C
LOCTITE 5290	UV/moisture cure silicone conformal coating. Designed for severe temperature environments. High-reliability automotive applications. Solvent-free.	20 sec. UV + 3 days at RT	300	-40°C to 200°C
LOCTITE SI 5293	Repairable, solvent-free, medium-viscosity, UV/moisture-cure silicone, designed for severe temperature environments. High-reliability automotive applications.	20 sec. UV + 3 days at RT	600	-40°C to 200°C



Key Benefits

Design

- Additive design allows for alternative solutions (simplified process vs. traditional technologies)
- "Sky Lining" allows the use of less material, precise encapsulation and less weight
- Functional design removes process steps
- Improved aesthetic appearance – custom colors and no additional housing

Process

- Reduced total cost of ownership (TCOO)
- Increased throughput
- Reduced equipment and operations footprint
- Low-viscosity materials allow for low injection pressures

Products

- Excellent adhesion to multiple surfaces
- Watertight encapsulation
- One component
- High-temperature, shock, environmental and solvent resistance
- Compliant materials suitable for sensitive electronic components
- Less handling and shorter process
- No cure process required
- UL tested

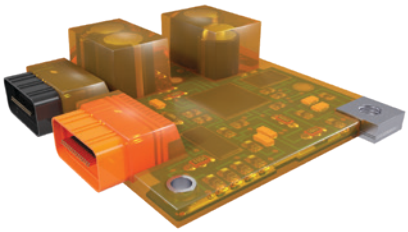
Sustainability

- Zero waste – All excess material and scrap are recyclable
- RoHS and REACH compliant

Low Pressure Molding

TECHNOMELT®, Henkel's unique polyamide hot melt material, provides a low pressure molding solution with extraordinary sealing adhesion and excellent temperature and solvent resistance. *TECHNOMELT* quickly encapsulates exposed circuitry to form the outer shell of the device and delivers a self-contained integrated assembly. Low application pressure between 20 and 500 psi within the mold cavity safeguards sensitive circuitry. When in a liquid state, *TECHNOMELT* flows in and around the tightest dimensions without the high levels of pressure used with traditional injection molding or potting techniques, and significantly reduces stress even for the most highly miniaturized components.

TECHNOMELT cycle time is very short, allowing for a high throughput process, and its functional design enables manufacturers to remove process steps. This novel material from Henkel has found application in a variety of products within the automotive, medical, industrial and consumer markets.



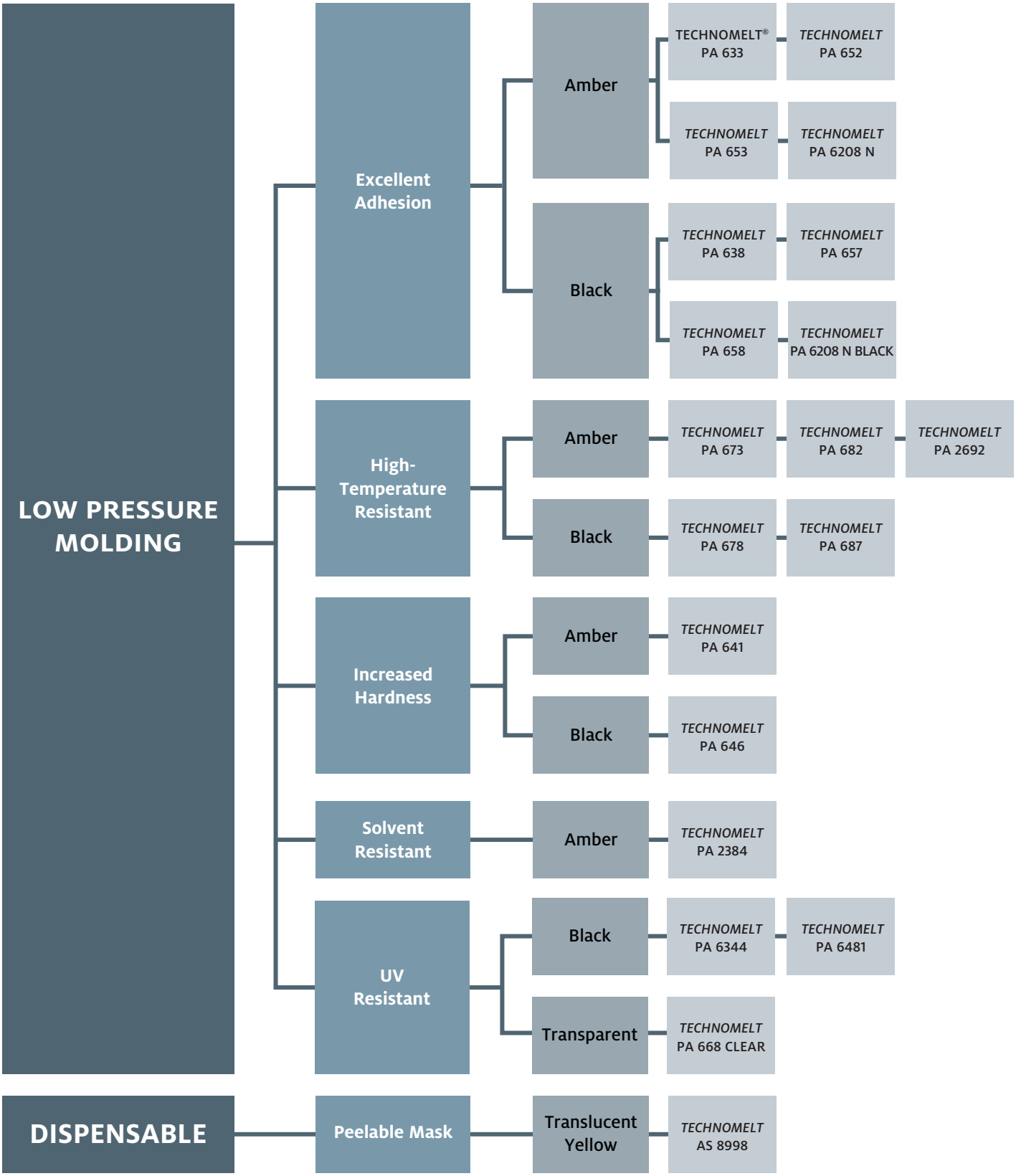
PROCESS

TRADITIONAL POTTING PROCESS FLOW

MOLD CASE → PALLETIZE → INSERT ELECTRONICS → PRE-HEAT → ENCAPSULATE → SETTLE OR VACUUM → CURE → TEST

LOW PRESSURE MOLDING PROCESS FLOW: THREE SIMPLE STEPS

INSERT ELECTRONICS → MOLD → TEST


LOW PRESSURE MOLDING
Excellent Adhesion
Amber
TECHNOMELT® PA 633
TECHNOMELT PA 652
TECHNOMELT PA 653
TECHNOMELT PA 6208 N
Black
TECHNOMELT PA 638
TECHNOMELT PA 657
TECHNOMELT PA 658
TECHNOMELT PA 6208 N BLACK
High-Temperature Resistant
Amber
TECHNOMELT PA 673
TECHNOMELT PA 682
TECHNOMELT PA 2692
Black
TECHNOMELT PA 678
TECHNOMELT PA 687
Increased Hardness
Amber
TECHNOMELT PA 641
Black
TECHNOMELT PA 646
Solvent Resistant
Amber
TECHNOMELT PA 2384
UV Resistant
Black
TECHNOMELT PA 6344
TECHNOMELT PA 6481
Transparent
TECHNOMELT PA 668 CLEAR
DISPENSABLE
Peelable Mask
Translucent Yellow
TECHNOMELT AS 8998

TECHNOMELT® LOW PRESSURE MOLDING PRODUCTS

PRODUCT	DESCRIPTION	COLOR	PERFORMANCE TEMPERATURE	SHORE HARDNESS	APPLICATION TEMPERATURE RANGE
Excellent Adhesion					
TECHNOMELT PA 633	High-performance thermoplastic polyamide with moderate strength and good adhesion for in-cabin and under-hood applications.	Amber	-40°C to 125°C	90A	200°C – 240°C
TECHNOMELT PA 638		Black			
TECHNOMELT PA 652	Moldable polyamide, where excellent adhesion and cold-temperature flexibility are important, such as in an automotive exterior. Also used extensively in white goods.	Amber	-40°C to 100°C	77A	200°C – 240°C
TECHNOMELT PA 657		Black			180°C – 230°C
TECHNOMELT PA 653	Moldable polyamide with excellent adhesion to plastic substrates. It is designed for improved performance where prolonged exposure to moisture and harsh environments is expected.	Amber	-40°C to 100°C	77A	210°C – 230°C
TECHNOMELT PA 658		Black			
TECHNOMELT PA 6208 N	Moldable polyamide with excellent adhesion to tough substrates. Great flexibility offers incredible strain relief on cables and wires. Ideal for encapsulation of heat-producing components in appliances and consumer electronics.	Amber	-40°C to 100°C	82A	180°C – 230°C
TECHNOMELT PA 6208 N BLACK		Black			
High-Temperature Resistant					
TECHNOMELT PA 673	Moldable polyamide with good adhesion for high-temperature applications, such as in an automotive under-hood.	Amber	-40°C to 140°C	88A	210°C – 240°C
TECHNOMELT PA 678		Black			
TECHNOMELT PA 682	Moldable polyamide for the most demanding high-humidity applications, such as for automobile tire pressure sensors. Formulated for very low water vapor transmission.	Amber	-40°C to 140°C	88A	225°C – 235°C
TECHNOMELT PA 687		Black			225°C – 235°C
TECHNOMELT PA 2692	Designed for excellent heat resistance and good oil resistance. This material is also hard and has a very low moisture sensitivity.	Amber	-40°C to 175°C	57D	240°C – 270°C
Increased Hardness					
TECHNOMELT PA 641	Moldable polyamide, where strength and hardness are needed, such as in memory sticks and computer connectors.	Amber	-40°C to 125°C	92A	210°C – 240°C
TECHNOMELT PA 646		Black			200°C – 240°C
Solvent Resistant					
TECHNOMELT PA 2384	Thermoplastic polyamide that exhibits good adhesion, excellent heat resistance and excellent resistance against gasoline containing 20% alcohol, as well as many other solvents or chemicals.	Amber	10°C to 175°C	67D	232°C – 260°C
UV Resistant					
TECHNOMELT PA 668 CLEAR	Thermoplastic polyamide designed for overmolding sensitive electronic devices. The material is clear in color and is UV stabilized to retain a high level of clarity after exposure to UV and heat. This makes it ideal for LED and lighting applications.	Transparent	-25°C to 105°C	90A	180°C – 230°C
TECHNOMELT PA 6344	High-performance, UV-resistant thermoplastic polyamide that exhibits good adhesion to a variety of substrates including solder mask.	Black	-40°C to 100°C	76A	210°C – 250°C
TECHNOMELT PA 6481	High-performance, UV-resistant thermoplastic polyamide that exhibits strong mechanical properties, abrasion resistance and increased hardness. Ideal for outdoor applications.	Black	-40°C to 130°C	93A	200°C – 240°C

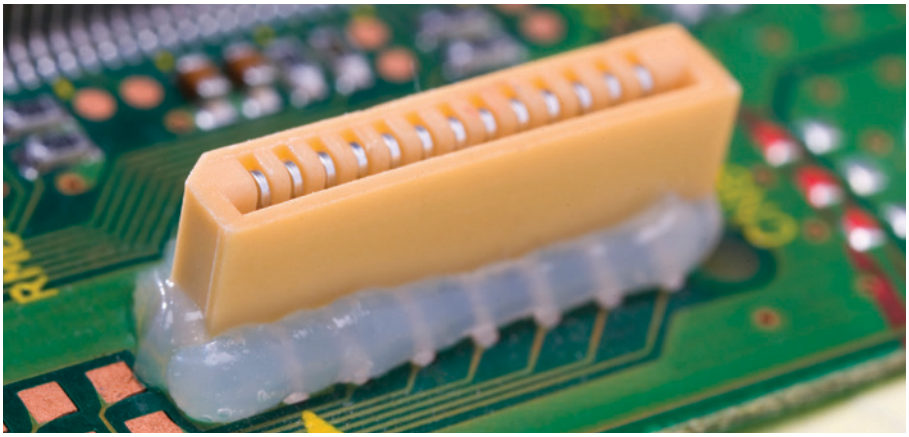
DISPENSABLE

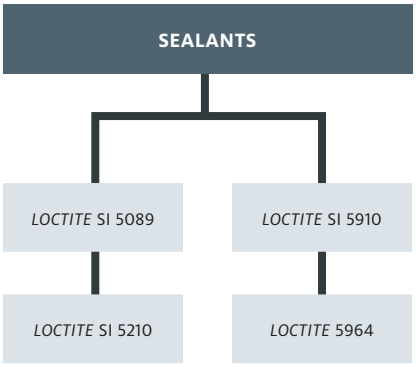
PRODUCT	DESCRIPTION	COLOR	SLUMP RESISTANCE	SHORE HARDNESS	VISCOSITY AT 163°C
Peelable Mask					
TECHNOMELT AS 8998	Peelable hot melt adhesive used to mask off areas that need protection before conformal coating is applied. Formulated to have excellent slump resistance.	Translucent Yellow	Up to 100°C	10A	2,900 to 4,000 cP

Sealants

Effective sealing of electronic components and modules protects complex, fine-pitch components from excessive thermal shock and high-temperature exposure. Henkel's silicone-based LOCTITE® sealant and encapsulant materials offer precise and reliable safeguarding of sensitive electronics against the damaging effects of moisture, while also improving thermal cycling performance.

Henkel's sealant materials are UV curable to enable fast processing; environmentally responsible with reduced solvent content; conveniently packaged for dispense operations; and offer exceptional ease of use. These advanced formulations are suitable for a wide variety of applications and manufacturing requirements.

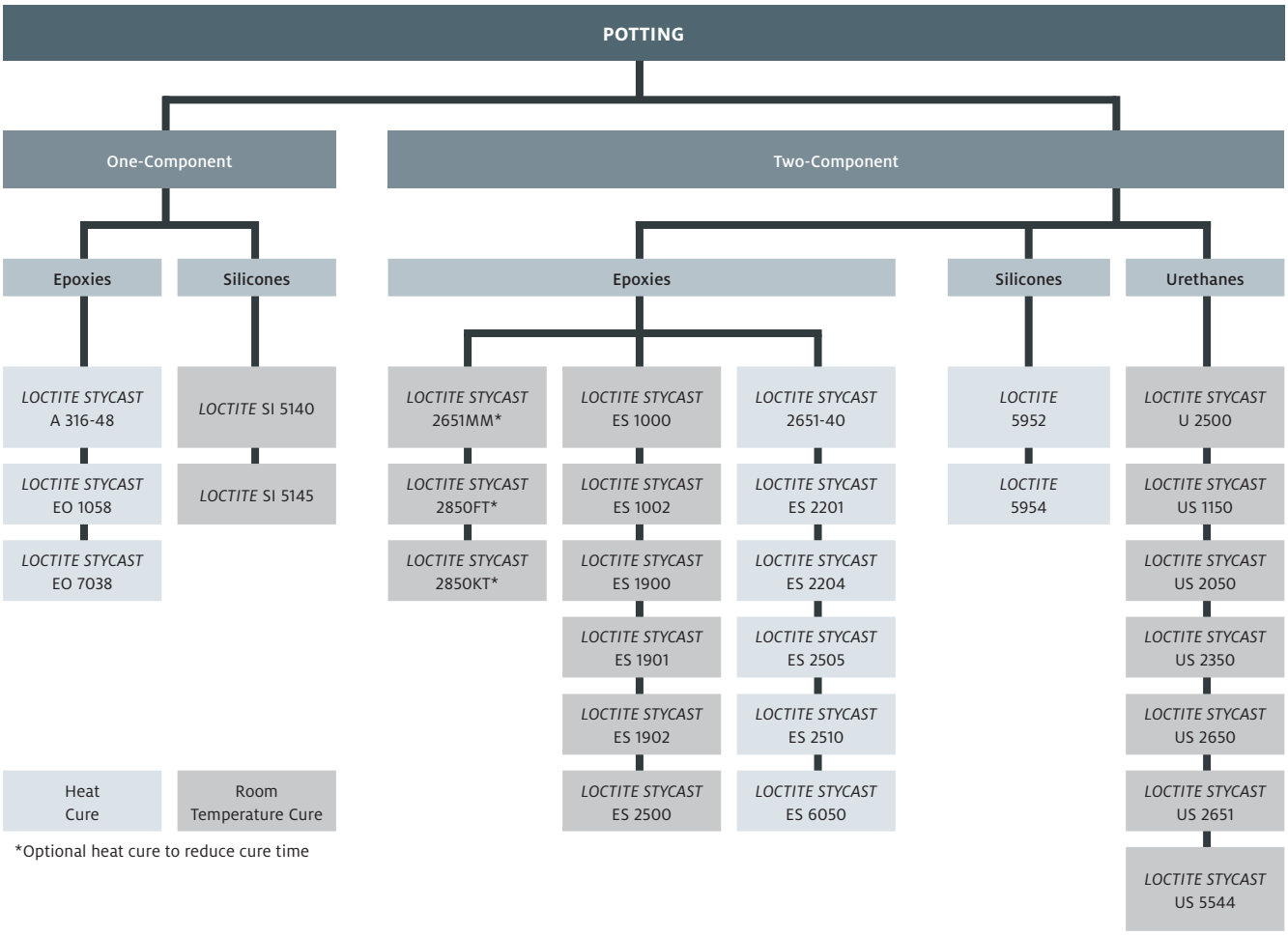




PRODUCT	DESCRIPTION	CURE SCHEDULES	CHEMISTRY	VISCOSITY (cP)	SHORE A HARDNESS
LOCTITE SI 5089	Used for gasketing and sealing applications. Upon exposure to sufficient UV light and/or atmospheric moisture, this product cures to form a durable, flexible rubber sealant. Typical applications include gasketing/sealing of enclosures that require a rapid-curing, post-applied sealant that facilitates immediate on-part inspection.	60 sec. UV + 3 days RT	Alkoxy silicone	100,000	≥ 25
LOCTITE SI 5210	One-component, ultra-fast-curing, noncorrosive RTV silicone designed for potting, wire tacking, selective sealing, vibration dampening and repair/rework applications on PCBs. Suited for high-volume manufacturing and is particularly effective for automotive electronics applications or other harsh environments. Fast surface cure allows material to be handled quickly after dispensing.	24 hrs. at 25°C	Alkoxy silicone	Extrusion rate-400 gm/min.	48
LOCTITE SI 5910	One-component silicone sealant. Typical applications include stamped sheet metal covers (timing covers and oil sumps) where good oil resistance and the ability to withstand high-joint movement is required.	7 days at 25°C	Oxime silicone	Extrusion rate-600 gm/min.	30
LOCTITE 5964	Heat-cured, cure-in-place gasket. Soft with high elongation. Compressible. Can be cured with heat or VFM.	10 min. at 150°C or 4 min. using VFM	Heat cure silicone	Extrusion rate-150 gm/min.	28

Potting

Potting and encapsulation systems from Henkel offer superb protection of printed circuit boards and electrical devices. Used in today's most challenging environments, such as automotive and defense/aerospace, where thermal conductivity and operating-temperature boundaries are pushed to the limit, potting materials deliver enhanced mechanical strength, provide electrical insulation and improve thermal reliability.

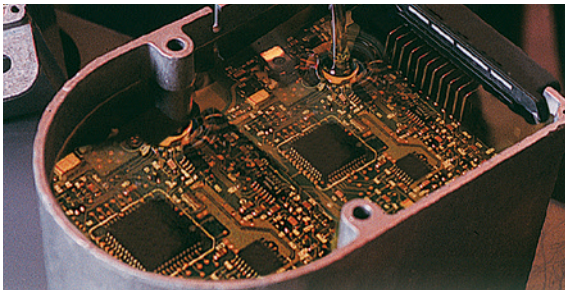


*Optional heat cure to reduce cure time

Henkel's potting formulas provide excellent adhesion strength to all surface types and are electrically insulating and thermally stable with a broad operating temperature range. Applications such as insulation of electronic components, protection of electronic control modules in automotive and defense/aerospace devices, and environmental safeguarding of consumer electronics like LED sign boards are all made more reliable with Henkel's potting and encapsulation materials.

Potting

PRODUCT	DESCRIPTION	COLOR	RECOMMENDED CURE SCHEDULE
ONE-COMPONENT EPOXIES			
LOCTITE® *STYCAST* A 316-48	One-component epoxy system. Pourable. Designed for harsh automotive applications. Fast cure. Room-temperature stable. Excellent thermal stability and chemical resistance.	Black	3 min. at 140°C
LOCTITE STYCAST EO 1058	One-component epoxy potting compound formulated to protect automotive sensors used in harsh environments. Provides excellent environmental and thermal protection.	Black	2 hrs. at 140°C
LOCTITE STYCAST EO 7038	One-component epoxy potting compound formulated to protect automotive sensors used in harsh environments.	Black	2 hrs. at 140°C
ONE-COMPONENT SILICONES			
LOCTITE SI 5140	Noncorrosive, self-leveling RTV silicone. Designed for shallow potting, sealing and coating of electronics.	Clear	72 hrs. at 25°C
LOCTITE SI 5145	High-strength, noncorrosive form-in-place RTV silicone adhesive for bonding and sealing electrical devices.	Clear	72 hrs. at 25°C
TWO-COMPONENT EPOXIES			
LOCTITE STYCAST 2651MM	Filled, general-purpose, epoxy encapsulant that requires low viscosity and low abrasion. It is especially useful for machine dispensing and for parts that require post-molding machining.	Black	24 hrs. at 25°C
LOCTITE STYCAST 2850FT	Two-component, thermally conductive epoxy encapsulant that can be used with a variety of catalysts. Used in the encapsulation of components that need heat dissipation and thermal shock properties.	Black	24 hrs. at 25°C
LOCTITE STYCAST 2850KT	Two-component, thermally conductive epoxy encapsulant designed for replacement for heat sinks in non-integrated electrical components and assemblies.	Black	24 hrs. at 25°C
LOCTITE STYCAST ES 1000	Two-component casting system with a long pot life. This low-cost, flexible system is filled with a non-abrasive filler for machine metering/dispensing. Good thermal shock resistance and low exotherm, making it suitable for encapsulation of various components and modules.	Black	36 hrs. at 25°C
LOCTITE STYCAST ES 1002	Two-component casting system with excellent handling properties. This low-cost, flexible system is filled with a non-abrasive filler for machine metering/dispensing or regular hand mixer applications.	Black	36 hrs. at 25°C
LOCTITE STYCAST ES 1900	Transparent, medium-viscosity, epoxy resin formulation recommended for small potting and laminating applications where clarity and excellent structural, mechanical and electrical properties are required.	Clear	24 hrs. at 25°C
LOCTITE STYCAST ES 1901	Fast-setting, toughened, medium-viscosity, industrial-grade epoxy adhesive. Ideal for bonding plastic, metal, glass, wood, ceramic, rubber and masonry materials where flexibility is needed. Designed for a variety of applications, such as flex circuits, cable boots and staking fillet bonds.	Clear	24 hrs. at 25°C



Potting – Continued

PRODUCT	VISCOSITY cP AT 25°C	POT LIFE AT 25°C	HARDNESS	THERMAL CONDUCTIVITY (W/m-K)	TEMPERATURE RANGE	SHELF LIFE
ONE-COMPONENT EPOXIES						
LOCTITE STYCAST A 316-48	50,000	3 months	86D	0.4	-40°C to 180°C	3 months at 25°C
LOCTITE STYCAST EO 1058	50,000	10 days	90D	0.5	-40°C to 180°C	7 months at 5°C
LOCTITE STYCAST EO 7038	40,000	3 days	92D	ND	-40°C to 180°C	4 months at 5°C or 12 months at -20°C
ONE-COMPONENT SILICONES						
LOCTITE SI 5140	35,000	skin over in 3 hrs.	30A	ND	-55°C to 205°C	12 months at 25°C
LOCTITE SI 5145	extrusion rate 200 g/min.	skin over in 3 hrs.	33A	0.2	-55°C to 205°C	12 months at 25°C
TWO-COMPONENT EPOXIES						
LOCTITE STYCAST 2651MM	14,000	45 min.	88D	0.6	-40°C to 205°C	1 year
LOCTITE STYCAST 2850FT	58,000	45 min.	96D	1.25	-40°C to 130°C	1 year
LOCTITE STYCAST 2850KT	174,000	10 min.	94D	2.68	-40°C to 130°C	1 year
LOCTITE STYCAST ES 1000	25,000	180 min.	75D	0.42	-25°C to 105°C	1 year
LOCTITE STYCAST ES 1002	19,500	60 min.	88D	0.64	-25°C to 105°C	1 year
LOCTITE STYCAST ES 1900	6,000	10 min.	90D	0.2	-60°C to 125°C	1 year
LOCTITE STYCAST ES 1901	2,400	3 min.	55D	0.2	-40°C to 105°C	1 year

Potting – Continued

PRODUCT	DESCRIPTION	COLOR	RECOMMENDED CURE SCHEDULE
TWO-COMPONENT EPOXIES *continued*			
LOCTITE® *STYCAST* ES 1902	Two-part, transparent, low-viscosity UV epoxy. Designed for potting and laminating applications where low color and excellent electrical and mechanical properties are desired. This material exhibits a fast UV gellation followed by room temperature cure. *LOCTITE STYCAST* ES 1902 has low shrinkage and bonds to most metals and many rigid plastics.	Clear	UV- 20 sec. at 200mW/ cm^2 plus 24 hrs. at 25°C
LOCTITE STYCAST ES 2500	Resilient, low-cost, fast-gelling potting compound. Designed for easy 2-to-1 meter mix-dispense machinery and low abrasion. This material is ideal for potting and encapsulating high-volume parts.	Black	16 hrs. at 25°C
LOCTITE STYCAST 2651-40	Low-viscosity, general-purpose epoxy encapsulant. Excellent adhesion to metals, plastics and ceramics. Compatible with *LOCTITE* CAT 9, *LOCTITE* CAT 11 and *LOCTITE* CAT 23LV.	Black	2 hrs. at 65°C
LOCTITE STYCAST ES 2201	Unfilled, low-viscosity epoxy casting system with exceptional resistance to impact and thermal shock. Adheres well to lead and wire materials like PVC, vinyl and neoprene.	Amber	24 hrs. at 25°C
LOCTITE STYCAST ES 2204	Filled, low-viscosity epoxy casting system. Recommended for potting where high-impact strength is required. Adheres well to lead and wire materials like PVC, vinyl and neoprene.	Black	24 hrs. at 25°C
LOCTITE STYCAST ES 2505	Low-viscosity, filled, dielectric-grade epoxy encapsulant designed for general-purpose applications. It is suitable for potting and encapsulating electrical devices that require flame retardancy. *LOCTITE STYCAST* ES 2505 is RoHS-compliant version of *LOCTITE STYCAST* 2651-40FR. Compatible with *LOCTITE* CAT 9, *LOCTITE* CAT 11 and *LOCTITE* CAT 23LV.	Black	60 min. at 120°C (with CAT 11)
LOCTITE STYCAST ES 2510	Low-viscosity, dielectric-grade epoxy encapsulant designed for general-purpose applications. It is suitable for potting and encapsulating electrical devices that require flame retardancy. Excellent dielectric properties. *LOCTITE STYCAST* ES 2505 is RoHS-compliant version of 9823-76. Compatible with *LOCTITE* CAT 9 and *LOCTITE* CAT 11.	Beige	2 hrs. at 60°C
LOCTITE STYCAST ES 6050	Filled, low volatile potting and sealing epoxy.	Pink	24 hrs. at 25°C
TWO-COMPONENT SILICONES			
LOCTITE 5952	Two-part, addition-cure silicone encapsulant. Good thermal conductivity. Noncorrosive. Excellent electrical properties.	Red	48 hrs. at 25°C
LOCTITE 5954	Two-part, highly filled, addition-cure, thermally conductive silicone. High thermal conductivity. Noncorrosive.	Red	48 hrs. at 25°C
TWO-COMPONENT URETHANES			
LOCTITE STYCAST U 2500	Encapsulant designed for transformers, PCBs and other insulation applications. Allows complete impregnation of either small, slightly wound coils or large castings.	Amber	24 hrs. at 25°C
LOCTITE STYCAST US 1150	Extended polybutadiene/MDI base, mineral-filled, medium-hardness, ambient-cure urethane encapsulant/sealant. This material can be used for potting electronics or devices for protection against environmental hazards.	Black	24 to 48 hrs. at 25°C
LOCTITE STYCAST US 2050	Quick-setting, optically clear polyurethane compound that exhibits excellent ultraviolet resistance. The excellent electrical properties also suggest its use for electrical and electronic component encapsulation.	Clear	48 hrs. at 25°C
LOCTITE STYCAST US 2350	Flexible, flame-retardant, mineral-filled polyurethane compound. This low-viscosity potting compound has a long pot life and adheres to many substrates.	Black	24 hrs. at 25°C
LOCTITE STYCAST US 2650	Inexpensive, low-viscosity, flexible, flame-retardant, castor oil/MDI-based urethane potting/encapsulating compound. This material was designed for potting indoor and outdoor telephone connector blocks. It is suitable for potting and encapsulating other electronic or electrical devices or assemblies.	Tan	16 hrs. at 25°C
LOCTITE STYCAST US 2651	Unfilled, low-viscosity, re-enterable potting and encapsulation compound. It can be used to encapsulate electronics for automotive applications, including under the hood.	Clear Amber	16 hrs. at 25°C
LOCTITE STYCAST US 5544	Fast-gelling, flexible, flame-retardant urethane encapsulant. Low-viscosity material that flows well and adheres to a variety of substrates.	Opaque White	4 hrs. at 25°C

Potting – Continued

PRODUCT	ALTERNATE CURE CYCLE	VISCOSITY cP AT 25°C	POT LIFE AT 25°C	HARDNESS	THERMAL CONDUCTIVITY (W/m-K)	TEMPERATURE RANGE	SHELF LIFE
TWO-COMPONENT EPOXIES *continued*							
LOCTITE STYCAST ES 1902	2 hrs. at 60°C	290	60 min.	80D	0.2	-40°C to 110°C	1 year
LOCTITE STYCAST ES 2500	2 hrs. at 65°C	1,500	10 min.	70D	0.288	-40°C to 105°C	1 year
LOCTITE STYCAST 2651-40	24 hrs. at 25°C	5,000	45 min.	88D	0.55	-40C to 130C	1 year
LOCTITE STYCAST ES 2201	2 hrs. at 60°C	600	35 min.	80D	0.21	-40°C to 125°C	1 year
LOCTITE STYCAST ES 2204	2 hrs. at 60°C	2,000	80 min.	85D	0.46	-40°C to 125°C	1 year
L*LOCTITE STYCAST* ES 2505	4 hrs. at 100°C (w/ CAT 11)	5,000	>4 hrs.	72D	0.82	-55°C to 155°C	1 year
LOCTITE STYCAST ES 2510	16 hrs. at 40°C	5,500	2.5 hrs.	70D	0.5	-40°C to 125°C	1 year
LOCTITE STYCAST ES 6050	2 hrs. at 60°C	8,000	30 min.	80D	ND	-40°C to 100°C	1 year
TWO-COMPONENT SILICONES							
LOCTITE 5952	2 hrs. at 65°C	40,000	100 min.	75A	0.85	-65°C to 260°C	6 months at 25°C
LOCTITE 5954	4 hrs. at 65°C	35,000	90 min.	85A	2.45	-65°C to 260°C	6 months at 25°C
TWO-COMPONENT URETHANES							
LOCTITE STYCAST U 2500	4 hrs. at 60°C	6,600	2 hrs.	72A	0.49	-40°C to 125°C	6 months
LOCTITE STYCAST US 1150	2 to 4 hrs. at 60°C	3,500	40 to 60 min.	60A	0.486	-65°C to 125°C	1 year
LOCTITE STYCAST US 2050	2 hrs. at 60°C	1,200	4 min.	90A	0.18	-40°C to 125°C	1 year
LOCTITE STYCAST US 2350	2 hrs. at 60°C	2,400	45 min.	85A	0.51	-65°C to 125°C	1 year
LOCTITE STYCAST US 2650	1 hr. at 60°C	3,500	19.5 min.	83A	0.47	-65°C to 125°C	1 year
LOCTITE STYCAST US 2651	1 hr. at 65°C	1,000	10 min.	15A	0.18	-65°C to 125°C	1 year
LOCTITE STYCAST US 5544	30 min. at 85°C	2,000	3 min.	85A	0.35	-65°C to 125°C	1 year

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