

Microelectronic Materials

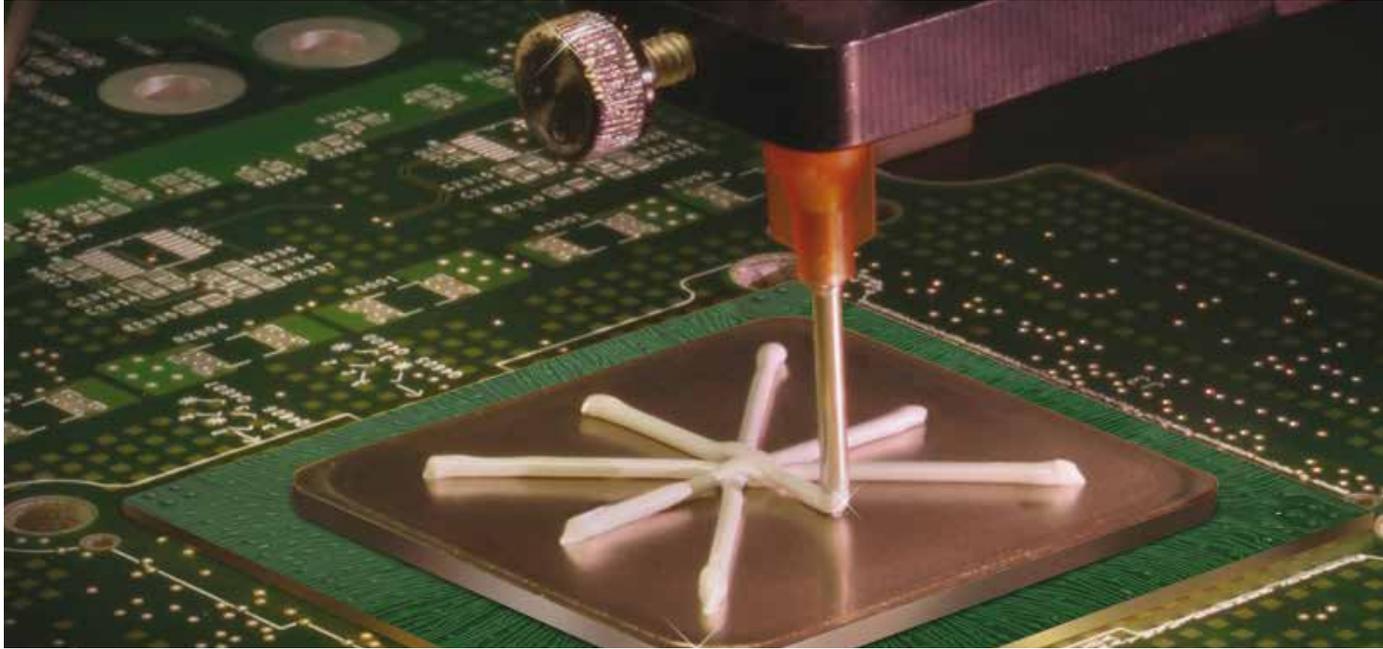
CATALOG

LORD
AskUsHow™

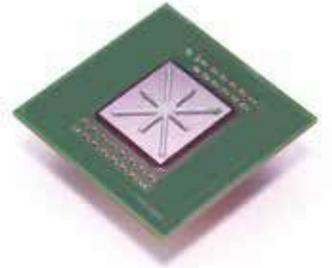
LORD partners with customers to leverage expertise in multiple chemistries and diverse applications to develop customized solutions.

LORD

ME-555
Underfill Encapsulant



Design Without Compromise



At LORD, we specialize in developing world-class thick film, thermal management, semiconductor packaging, circuit assembly, potting and encapsulation materials for demanding applications. Our experience in electronic materials spans more than 50 years, and we incorporate this vast knowledge in developing solutions for new applications to help ensure our customers' success.

The custom solutions we develop for our customers address specific performance requirements. We continue with this approach today, and the result is a more customized solution to address customer needs with a rapid response time.

If you need help choosing one of our standard microelectronic products or if they don't quite meet your needs, let us help you determine an appropriate solution for your application ... Ask Us How.

SEMICONDUCTOR PACKAGING

Semiconductor packaging materials are materials used to assemble semiconductor packages and range from adhesives to encapsulants. Our Surface Mount and Die Attach adhesives are designed to enhance the assembly process and improve reliability. Our Glob Top, Dam and Underfill encapsulants provide environmental protection, reduce warpage, demonstrate excellent flow, offer good adhesion to multiple substrates and have the strength to handle over-molding and subsequent process steps.

THERMAL MANAGEMENT

LORD CoolTherm™ thermal management materials are critical to the reliability of the semiconductor chip. Thermal management materials are used to effectively transfer heat from the semiconductor chip or package to the heat sink or heat spreader and are available in adhesives, gels or greases. These materials offer a variety of thermal performances, dependent on the end use application.

	Adhesives	Encapsulants	Underfills	Gels	Greases	Thermally Conductive	Electrically Conductive	Components		Viscosity, cps @ 25°C
								1K	2K	
Circalok™ 6027	x							x		450,000
CoolTherm™ EP-6037	x					x			x	500,000
CoolTherm EP-6150	x					x		x		145,000
CoolTherm EP-6151	x					x		x		750,000
CoolTherm EP-6960	x					x	x	x		150,000
CoolTherm EP-6968	x					x	x		x	250,000
Thermoset™ 945-6443	x							x		25,000
CoolTherm EP-343	x					x			x	55
Thermoset MA-420	x							x		2,100,000
Thermoset MA-511	x							x		300,000
CoolTherm MT-125	x					x		x		100,000
CoolTherm MD-140 SP	x					x	x	x		30,000
CoolTherm MD-161	x					x	x	x		40,000
CoolTherm MT-220	x					x		x		100,000
CoolTherm MT-322	x					x		x		65,000
CoolTherm SC-322	x					x		x		65,000
CoolTherm MT-815	x					x	x	x		50,000
Thermoset EP-937		x						x		47,900

Cure Schedule	Thermal Conductivity, W/mK	Volume Resistivity, ohm-cm @ 25°C	Glass Transition Temperature (T _g), °C	Description
30 min @ 121°C 10 min @ 150°C		>1 x 10 ¹⁴	90	Thixotropic rapid cure epoxy adhesive that provides excellent thermal stability and chemical resistance. It is designed for use in the assembly of electronic components.
24 hr @ 25°C 2 hr @ 65°C	1.2 (w/CoolTherm 6010B) 1.1 (w/CoolTherm 6252)	>1 x 10 ¹⁵	106 (w/CoolTherm 6010B) 70 (w/CoolTherm 6252)	Epoxy resin for use with various hardeners to create an epoxy system. It is designed for use as a thermal interface material between heat sinks and power devices.
30 min @ 121°C 10 min @ 177°C	0.6	>1 x 10 ¹⁵	141	Thixotropic rapid cure epoxy adhesive that provides excellent thermal stability and chemical resistance. It is designed for use in the assembly of electronic components.
30 min @ 121°C 10 min @ 177°C	0.6		124	Aluminum-filled epoxy adhesive designed for use as a thermal interface material between heat sinks and in other applications requiring good adhesion and heat transfer properties.
90 min @ 125°C 30 min @ 150°C 5 min @ 210°C	1.1	<0.0008	49	Silver-filled conductive adhesive that offers excellent electrical conductivity and room temperature stability. It provides excellent adhesion to various surfaces including silicon, ceramic, plastics and metal.
24 hr @ 25°C 1 hr @ 65°C	1.2	<0.001		Silver-filled conductive adhesive that offers excellent electrical conductivity and good adhesion to a wide variety of substrates including glass and most plastics. It can be used where room temperature or low temperature cure is preferred.
2.5 min @ 125°C 1.5 min @ 150°C		>1 x 10 ¹⁵	150	Rapid cure epoxy adhesive that provides excellent thermal stability, chemical resistance and possibility of low temperature cure.
2 hr @ 65°C followed by 4 hr @ 135°C	1.1	1 x 10 ¹⁶	106	Thermally conductive epoxy conformal coating adhesive recommended for coating printed circuit boards, semiconductors and heat sink assemblies.
3 min @ 120°C 60-90 sec @ 150°C		9 x 10 ¹⁵	70	Surface mount adhesive that provides snap cure for high speed printed circuit board assembly.
3 min @ 120°C 60-90 sec @ 150°C		>9 x 10 ¹⁵	70	Surface mount adhesive or sealant for microelectronic applications.
30 min @ 100°C 8 min @ 150°C	2.35	2 x 10 ¹³	123	Rapid cure, one-component adhesive that provides long working life and high thermal conductivity.
5-10 min @ 120°C 3-5 min @ 150°C 1-3 min @ 180°C	12	0.0001	82	Silver-filled electrically conductive adhesive designed for use in thermally demanding die attach application where thin bondline is desired.
60 min @ 150°C	1.9	<0.001	55	Electrically conductive adhesive designed for demanding LED assembly applications.
30 min @ 125°C 10 min @ 150°C	4.2	1.25 x 10 ⁷	-90	Fast cure, one-component adhesive that provides superior adhesion strength and extremely high thermal conductivity.
60 min @ 120°C 30 min @ 150°C	1.7	2 x 10 ¹⁵		Thermally conductive silicone adhesive that forms a flexible elastomer. It exhibits low shrinkage and low stress on components as it cures.
60 min @ 120°C 30 min @ 150°C	1.7	2 x 10 ¹⁴	-47	Thermally conductive silicone adhesive that contains glass beads for use where thermal dissipation and bondline control are desired.
60 min @ 125°C (alternative cure conditions available)	12	0.0001	11	Low modulus, silver-filled, electrically conductive adhesive designed for use in thermally demanding die attach applications. It may be used for solder replacement.
6-12 min @ 150°C 12 min @ 135°C 18-28 min @ 120°C 60-80 min @ 100°C		1 x 10 ¹⁵	125	Epoxy encapsulant designed for coating semiconductor devices on printed circuit boards.

	Adhesives	Encapsulants	Underfills	Gels	Greases	Thermally Conductive	Electrically Conductive	Components		Viscosity, cps @ 25°C
								1K	2K	
Thermoset ME-430		x						x		317,500
Thermoset ME-455		x						x		19,000
Thermoset ME-456		x						x		1,200,000
Thermoset LS 213-9		x	x					x		2,800
CoolTherm ME-525			x			x		x		6,000
CoolTherm ME-531			x			x		x		4,000
Thermoset ME-532			x					x		3,000
CoolTherm ME-543			x			x		x		21,000
CoolTherm ME-555			x			x		x		5,500
Thermoset ME-588			x					x		13,000
CoolTherm MG-120				x		x		x		400,000
CoolTherm MG-121				x		x		x		60,500
CoolTherm MG-122				x		x		x		60,000
CoolTherm MG-133				x		x		x		128,400 (shear rate 5/sec)
CoolTherm SC-6754					x	x		x		500,000
CoolTherm SG-21					x	x		x		1,800,000
CoolTherm TC-404					x	x		x		212,400 (shear rate 5/sec)
CoolTherm TC-405					x	x		x		175,000 (shear rate 5/sec)
CoolTherm TC-501					x	x		x		128,400

Cure Schedule	Thermal Conductivity, W/mK	Volume Resistivity, ohm-cm @ 25°C	Glass Transition Temperature (Tg), °C	Description
30 min @ 150°C		1 x 10 ¹⁵	135	High purity epoxy encapsulant designed for encapsulation of Chip-on-Board (COB) devices.
30 min @ 150°C		1 x 10 ¹⁵	135	High purity epoxy encapsulant designed for encapsulation of wire-bonded or flip chip die cavity packages.
30 min @ 150°C		>1 x 10 ¹⁵	135	High purity epoxy dam material for use where a dam is needed to restrict flow of a cavity fill encapsulant.
2 hr @ 120°C 5 hr @ 104°C 8 hr @ 93°C		2 x 10 ¹⁵	80	Unfilled epoxy encapsulant designed for electrical laminations, encapsulation, or reworkable underfill applications.
30 min @ 150°C 15 min @ 165°C	0.5	1 x 10 ¹⁵	120	High purity epoxy underfill developed for encapsulation of electronic components.
30 min @ 150°C 15 min @ 165°C	0.5	1 x 10 ¹⁵	140	High purity epoxy underfill developed for encapsulation of electronic components. Specially designed for higher temperature applications.
90 min @ 150°C 60 min @ 165°C		1.27 x 10 ¹⁶	135	High purity epoxy underfill developed for encapsulation of electronic components. Specially designed for low standoff assembly.
7-20 min @ 160-165°C	1.2	>1 x 10 ¹⁵	135	High purity epoxy underfill developed for encapsulation of electronic component. Specially designed to be used when anhydride-free and thermal conductivity are desired.
30 min @ 150°C 15 min @ 165°C	0.5	1 x 10 ¹⁵	125	High purity epoxy underfill developed for encapsulation of electronic components.
7-20 min @ 160-165°C		>1 x 10 ¹⁵	139	High purity epoxy underfill developed for encapsulation of electronic component. Specially designed to be anhydride-free.
60 min @ 120°C 30 min @ 150°C	2.8	8 x 10 ¹³	-121	Thermally conductive silicone gel exhibits very low thermal resistance and good HAST resistance. It is designed to inhibit bleeding, separation and pump-out.
2 hr @ 100°C 60 min @ 125°C 30 min @ 150°C	2.3	8 x 10 ¹³	-121	Thermally conductive silicone gel exhibits very low thermal resistance and good HAST resistance. It is designed to inhibit bleeding, separation and pump-out.
60 min @ 120°C 30 min @ 150°C	2.8	8 x 10 ¹³	-121	Thermally conductive silicone gel exhibits very low thermal resistance and good HAST resistance. It is designed to inhibit bleeding, separation and pump-out.
60 min @ 100°C 30 min @ 120°C	3.6		-110	Thermally conductive silicone gel exhibits very low thermal resistance and good HAST resistance. It is designed to inhibit bleeding, separation and pump-out.
	0.5	1 x 10 ¹⁴		Thermally conductive silicone grease designed for applications where low thermal conductivity is sufficient. It is suitable for larger area applications.
	0.8			Non-reactive, thermally conductive silicone grease used when applications may require the heat sink to be removed from the device.
	4.3			Non-reactive, solvent-free thermally conductive silicone grease designed for applications with demanding thermal concerns. It is reworkable.
	5			Non-reactive, solvent-free thermally conductive silicone grease designed for applications with demanding thermal concerns. It is reworkable.
	3.6			Solvent-free thermally conductive silicone grease which forms cross-linking structure over time to avoid pump out.



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Values stated herein represent typical values as not all tests are run on each lot of material produced. For formalized product specifications or specific product end uses, contact the Customer Support Center.

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