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Permabond®
Engineering Adhesives

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ANTALA

Key Electronic Products

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HUNTSMAN Araldite®

Enriching lives through innovation — Build. Bond. Protect.

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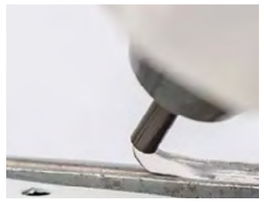
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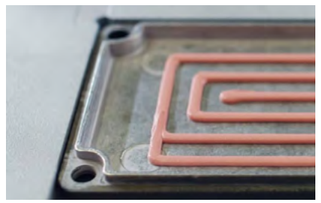
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Adhesives and Sealants

ADHESIVES AND SEALANTS





Adhesives and sealants have numerous electronic applications, from joining protective housings to bonding components on a PCB. They are available in various bond strengths and elasticities to ensure design flexibility, long-term performance, and component reliability — even under harsh operating conditions. Adhesives and sealants also have various cure methods and are often resistant to contaminants and harsh environmental conditions, protecting sensitive components, strengthening bonds between materials, and combatting mechanical stress.

1. One-Part RTV Adhesives

One-part room-temperature-vulcanising (RTV) adhesives vary significantly in tack time; a short tack time is ideal for fast production throughput, whilst a long tack time is forgiving should you need to apply the adhesive to a large area. Many RTV adhesives are neutral curing, making them ideal for contact with sensitive metals and electronics. RTV adhesives cure at room temperature and require moisture to cure, whilst cure length depends on the thickness of the bead applied.

Product	Description	Standards / Approvals	Operating Temperature	Viscosity (mPa.s) at 23°	Colour	Tack Free Time at 25°C (min)	Tensile Strength /Elongation
SILICONE							
Dowsil™7091	Formed-in-Place Gasket (FIPG).	UL 94-HB, UL RTI 105, EN 45545-2, HL1(R22), HL2(R23), HL3(R24)	**-40°C** to **180°C**	Non-flowing	Black/white/ grey	28	2.5 MPa / 680%
Dowsil™744	General purpose adhesive with high elongation.	UL 94-HB, UL RTI 105	**-45°C** to **200°C**	Non-flowing	White	55	2.7 MPa / 590%
Dowsil™738	Non-flowing adhesive with high elongation.	MIL-A-46146	**-55°C** to **200°C**	Non-flowing	White	89	2.5 MPa / 500%
Dowsil™3140	Good flowablility, flame resistance, UL, IPC Wand MIL-SPEC.	UL 94-HB, UL RTI 180, IPC-CC-830, MIL-SPEC	**-45°C** to **200°C**	Self-leveling 34,400	Transluscent	116	3.0 MPa / 419%
Dowsil™3145	Non-flowing adhesive with high tensile strength, elongation and thermal stability.	UL 94-HB, UL RTI 180, IPC-CC-830, MIL-A-46146	**-45°C** to **200°C**	Non-flowing	Grey/ Transparent	78	7.1 MPa / 670%
Dowsil™3165 Fast Tack	Non-flowing adhesive with fast tack free time, good green strength and flame resistance.	UL 94 V-0, UL RTI 105	**-45°C** to **200°C**	Non-flowing	Grey	5	0.9 MPa / 185%
Dowsil™SE 9168	Non-flowing adhesive with fast tack free time, controlled volatility and flame resistance.	UL 94 V-0, UL RTI 130	**-45°C** to **200°C**	Non-flowing	Grey	6.5	3.7 MPa / 363%
Dowsil™SE 9186	Flowable, fast tack-free time and controlled volatility adhesive.	-	**-45°C** to **200°C**	64,000	Black/ Transparent/ White	8	2.5 MPa / 550%
Dowsil™SE 9186 L	Very flowable, fast tack-free time and controlled volatility adhesive.	-	**-45°C** to **200°C**	Self-leveling 27,000	Transparent	8	1.6 MPa / 340%
Dowsil™SE 9189 L	Flowable adhesive with controlled volatility and flame resistance.	UL 94 V-0, UL RTI 105	**-45°C** to **200°C**	Self-leveling 22,000	White/Grey	8	2.0 MPa / 220%

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Product	Description	Standards / Approvals	Operating Temperature	Viscosity (mPa.s) at 23°	Colour	Tack Free Time at 25°C (min)	Tensile Strength /Elongation
Dowsil™EA-2900	High performance for fast assembly.	UL 94 V-1	**-45°C** to **200°C**	Non-flowing	White	20	2.1 MPa / 400%
Dowsil™SE 9152 HT	Flowable, fast tack-free time and excellent high thermal stability.	-	**-45°C** to **275°C**	Self-leveling 10,000	Reddish Brown	22	0.7 MPa / 280%
Dowsil™SE 9185	Non-flowing adhesive with fast tack free time with controlled volatility.	-	**-45°C** to **200°C**	Non-flowing	Transparent	6	3.0 MPa / 515%
Dowsil™7094	Flowable, neutral cure sealant.	-	**-50°C** to **180°C**	Self-leveling 28,000	Black/White	50	1.2 MPa / 400%

2. One-Part Heat Cure Adhesives

Requiring heat to cure, these adhesives have an indefinite open time at room temperature, making them ideal when applying a long bead or time-consuming complex geometry. One-part heat cure adhesives generally offer excellent adhesion to numerous substrates, and priming or cleaning substrates before application can further promote chemical bonding.

One-Part Heat Cure Adhesives

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	Tensile Strength / Elongation	Shore Hardness	Dielectric Strength (kV/mm)
SILICONE									
Dowsil™866	Flowable adhesive with high tensile strength.	-	**-45°C** to **200°C**	Self-leveling 48,000	Grey	1 hour at 125°C or 30 mins at 150°C	6.4 MPa / 210%	57A	20
Dowsil™3-6265	Non-flowing adhesive with high tensile strength and UV indicator for easy inspection.	-	**-45°C** to **200°C**	Non-flowing	Black	1 hour at 125°C or 30 mins at 150°C	4.8 MPa / 165%	60A	21
Dowsil™3-6265 HP	Non-flowing adhesive with high tensile strength.	UL 94 V-0 • UL RTI 105	**-55°C** to **200°C**	Non-flowing	Black	240 mins at 100°C or 50 mins at 120°C or 25 min at 125°C or 10 mins at 150°C	5.8 MPa / 275%	68A	24
Dowsil™EA-7100	Non-flowing adhesive with excellent adhesion to a wide variety of substrates.	-	**-45°C** to **200°C**	Non-flowing	Black	15 mins at 100°C	3.4 MPa / 260%	43A	17
Dowsil™Q3-6611	Flowable adhesive with high tensile strength.	-	**-45°C** to **200°C**	Flowable 87,025	Grey/Black	1 hour at 125°C or 30 mins at 150°C	5.8 MPa / 240%	59A	-
Dowsil™ 3-6096	Non-flowing adhesive with rapid heat cure.	-	**-40°C** to **250°C**	Paste	Black	1 hour at 120°C or 15 mins at 150°C or 5 mins at 180°C	3.7 MPa / 215%	45A	-

3. Two-Part Heat Cure Adhesives

Requiring heat to cure, these adhesives have an indefinite open time at room temperature, making them ideal when applying a long bead or time-consuming complex geometry. Two-part heat cure adhesives are suitable for high-volume production as they can be applied with a mix and dispense machine.

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	Mix Ratio	Tensile Strength (MPa) / Elongation	Shore Hardness	Dielectric Strength (kV/mm)
SILICONE										
Sylgard®577	High mechanical resistance • Good Flame Resistance (98,000mPa.s).	UL 94 V-0 • UL RTI 150 • MIL- PRF-23586F	**-45°C** to **200°C**	98,000	Grey	1 hour at 125°C	10:1	6.8 / 224%	60A	19
Dowsil™SE 1700	Adhesive with high tensile strength.	-	**-45°C** to **200°C**	Non-flowing	White/ Translucent	30 mins at 150°C	10:1	6.8 / 355%	48A	22
Dowsil EA-6060	Adhesive with fast cure at moderate temperature.	-	**-45°C** to **200°C**	Non-flowing	Black/White	30 mins at 80°C or 15 mins at 90°C or 10 mins at 100°C	1:1	3.1 / 290%	42A	18

4. Hot Melt Adhesives

Hot melt adhesives solidify rapidly due to quick viscosity increase and fast tack-free time, allowing for swift processing. Whilst the adhesive cools down quickly after application, full cure can take several days. Therefore, unless rigorous testing is performed immediately after application, electronic units often proceed down the production line whilst curing continues.

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	Tensile Strength (MPa) / Elongation	Shore hardness
SILICONE								
Dowsil™EA-5151	Formulated to have immediate green strength.	-	**-45** to **150°C**	60.000	Black	15 mins	4.5 / >1000%	50A
Dowsil™ HM-2510	Reactive hot melt silicone sealant with immediate strength.	FDA / 21 CFR 177.2600 / NSF 51 & 61	**-50°C** to **150°C**	110.000	Transparent	15 mins	4.6 / >1000%	38A

5. UV Cure Adhesives

UV cure adhesives offer some of the fastest throughput times in production, curing under UV light within seconds. In UV curing, it's essential to ensure the whole bead is exposed to UV light, as curing cannot occur in shadowed areas. Similarly, using the correct curing equipment is imperative, or the adhesive will not cure to its full technical properties.

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure t ime	Max Gap (mm)	Fixation time (4mW/cm)	Tensile (MPa)	Shore hardness	Elongation at break
ACRYLIC + CYANOCRILATE											
Born2Bond Light Lock MV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	180 - 220	Transparent/ Greenish	10 secs	0.15	5 secs	30	81D	1,0%
Born2Bond Light Lock HV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	600 - 900	Transparent/ Yellowish	10 secs	0.3	5 secs	29.2	76D	1,5%
Born2Bond Light Lock Gel	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas. Gap filling capacity.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	30,000 - 45,000	Transparent/ Greenish	15 secs	10	5 secs	25	78D	0,1%
Born2Bond Light Lock 30X	Low odour, low blooming, dual curing, hybrid cyanoacrylate - acrylate adhesive. Rapid, tough and flexible bonding on transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **60°C**	150 - 350	Transparent/ Greenish	10 secs	0.15	5 secs	38	60-65D	120%
Permabond®UV610	Low viscosity • Solvent-free.	–	**-45°C** to **150°C**	800 - 1,000	Transparent	10 secs	0.3	10 secs	17	70D	95%
Permabond®UV625	Solvent-free.	–	**-45°C** to **150°C**	Gel Like	Transparent	5 secs	2.5	5 secs	16	65D	>60%

6. Two Part Room Temperature Cure Adhesives

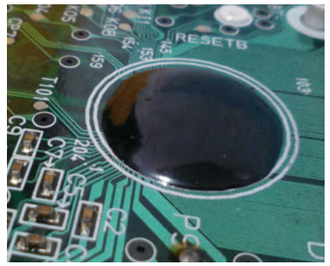
Whilst silicone adhesives are typically the go-to chemistry type, epoxy and polyurethane adhesives can outperform silicones in certain instances and applications. For example, epoxy-based adhesives are favoured in areas exposed to certain chemicals, whilst polybutadiene-based polyurethane adhesives are preferred in underwater applications.

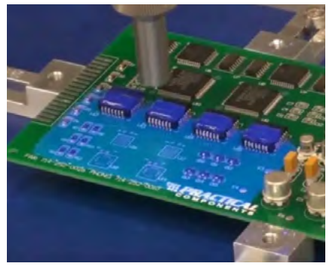
Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Handling time at 23°C	Fixture time at 23°C	Shear resistance (MPa)	Elongation at break (%)
EPOXY									
Araldite®2014-2	Adhesive with high temperature resistance, chemical resistance and KIWA approval.	KIWA	**-45°C** to **140°C**	Thixotropic	Grey	110 mins	3h	18	1
Araldite®2011	General purpose adhesive with long pot life.	-	**-45°C** to **90°C**	40,000	Pale Yellow	100 mins	7h	26	9
Araldite®2012	Fast curing and self leveling adhesive.	-	**-45°C** to **70°C**	30,000	Yellow	6 mins	20 mins	18	4

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Handling time at 23°C	Fixture time at 23°C	Shear resistance (MPa)	Elongation at break (%)
Araldite®2015-1	Adhesive with extreme resistance to weathering and dynamic loading.	Lloyd's Register, EN 45545-2	**-45°C** to **100°C**	Thixotropic	Beige	45 mins	4 hours	17	4
POLYURETHANE									
Araldite®2028-1	UV stable.	-	**-45°C** to **90°C**	5000	Transpa-rent	15 mins	6 mins	15	6
SILICONE									
Dowsil EA- 3838	Allows very fast assemblies at RTV. Mix ratio can be tuned to tailor the curing speed.	-	**-50°C** to **180°C**	Thixotropic	Black	5-8 mins at 25°C	<1 hour	>1/5 hours	>250

CONFORMAL COATINGS

CONFORMAL COATINGS





Conformal coatings are thin polymeric films typically applied to PCB at a dry film thickness of 25 µm – 200 µm, depending upon the chemistry type. They protect against adverse environmental conditions, such as humidity, as well as protecting the PCB from corrosion. Conformal coatings were initially adopted by the automotive and aerospace industries, providing a lightweight solution to extend the life of the electronics. Today, where demands on product reliability are ever-increasing, the user base of conformal coatings has grown to include many consumer and domestic electronics.

7. UV Cure Conformal Coatings

Often chosen for health and safety benefits as they are generally solvent-free, UV cure conformal coatings are ideal for fast throughput production, where low takt time is desirable. Curing methods vary from mercury lamps to LEDs, though the correct curing equipment for your chosen material is essential to achieving optimal performance properties.

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure time	Max Gap (mm)	Fixation time (4mW/cm)	Tensile (MPa)	Shore hardness	Elongation at break (%)	Dielectric Strength (kV/mm)
ACRYLIC												
Permabond®UV681	Doming conformal coating, ideal for smart card microchips with low viscosity.	-	**-55°C** to **100°C**	80 - 120	Transparent	15 secs	0.15	7 secs	10-12	50 - 65D	>50	13
Permabond®UV683	Doming conformal coating, ideal for smart card microchips with high viscosity.	-	**-55°C** to **100°C**	1,000 - 1,600	Transparent	15 secs	0.15	7 secs	12-14	50 - 65D	>50	23
ACRYLIC + CYANOCRILATE												
Born2Bond Light Lock MV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	180 - 220	Transparent /Greenish	10 secs	0.15	5 secs	30	81D	1.0	36.5
Born2Bond Light Lock HV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	600 - 900	Transparent /Yellowish	10 secs	0.3	5 secs	29.2	76D	1.5	59.3
Born2Bond Light Lock Gel	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas. Gap filling capacity.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	30,000 - 45,000	Transparent /Greenish	15 secs	10	5 secs	25	78D	0.1	18.8
Born2Bond Light Lock 30X	Low odour, low blooming, dual curing, hybrid cyanoacrylate - acrylate adhesive. Rapid, tough and flexible bonding on transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **60°C**	150-350	Transparent /Greenish	10 secs	0.15	5 secs	38	65D	120	100.6

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8. RTV Cure Conformal Coating

RTV conformal coatings offer a long usable life at room temperature which is ideal if applying the coating via dip application. Once cured, these coatings form a highly flexible polymer and generally have fast touch dry times without investing in curing equipment. Some of these materials are also suitable for adhesive applications.

Products	Description	Standards / Approvals	Operatoing temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Shore hardness	Touch Dry Time at 25°C	Dielectric Strength (kV/mm)
SILICONE								
Dowsil™ 3-1953	Solvent free, room temperature cure silicone based conformal coating with good adhesion and UV indicator.	UL 94 V-0 • MIL-SPEC • IPC-CC-830A • UL 746E • UL RTI 130	**-45°C** to **200°C**	350	Translucent	34A	8 mins	17
Dowsil™ 3-1965	Solvent free, low viscosity, room tempertaure cure silicone based conformal coating with good adhesion.	UL 94 V-0 • MIL-SPEC • IPC-CC-830 • UL RTI 105	**-45°C** to **200°C**	115	Transparent	33A	6 mins	17
Dowsil™ 1-2620	Solvent based, low viscosity conformal coating with good abrasion resistance after cure.	UL 94 V-0 • MIL-SPEC, IPC-CC-830B • UL 746E • UL RTI 130	**-45°C** to **200°C**	150	Transparent	80A	5 mins	22
Dowsil™ 1-2620 Low VOC	Low VOC, solvent based, room temperature cure, silicone based conformal coating with good abrasion resistance and UV trace.	UL 94 V-0 • MIL-SPEC • IPC-CC-830A • UL 746E • UL RTI 130	**-45°C** to **200°C**	350	Transparent	80A	15 mins	16
Dowsil™ 1-2577	Solvent based, medium viscosity conformal coating with good abrasion resistance after cure.	UL 94 V-0 • MIL-SPEC • IPC-CC-830A • UL 746E • UL RTI 130	**-45°C** to **200°C**	950	Transparent	80A	7 mins	16
Dowsil™ 1-2577 Low VOC	Low VOC, solvent based, medium viscosity conformal coating with good abrasion resistance after cure.	UL 94 V-0 • MIL-SPEC • IPC-CC-830A • UL 746E • UL RTI 130	**-45°C** to **200°C**	1,050	Transparent	85A	6 mins	13
Dowsil™ SE 9157	Solvent free, room temperature cure, silicone based conformal coating with medium-high viscosity. Cures to low stress elastomer.	-	**-45°C** to **200°C**	5,675	Translucent	25A	6 mins	27
Dowsil™ SE 9186 L	Solvent free silicone based conformal coating with controlled volatility, suitable for spot protection or doming of components.	-	**-45°C** to **200°C**	27,000	Translucent	25A	8 mins	23
Dowsil™ 3140	Solvent free, room temperature cure silicone based conformal coating with good flowability and UV indicator.	UL 94 V-1 • MIL-SPEC • IPC-CC-830B • UL 746E • UL RTI 105	**-45°C** to **200°C**	34,400	Transparent	32A	116 mins	15
Dowsil™ 3-1944	Solvent free, room temperature cure silicone based conformal coating with good flowability, fast touch dry time and UV indicator.	MIL-SPEC• IPC-CC-830B • UL 746E	**-45°C** to **200°C**	63,775	Translucent	36A	14 mins	21
Dowsil™ 9187L	Solvent free silicone based conformal coating with controlled volatility, suitable for spot protection or doming of components.	UL 94 HB (Black and white only)	**-45°C** to **200°C**	1,100	Black/White/ Transparent	17A	8 mins	20

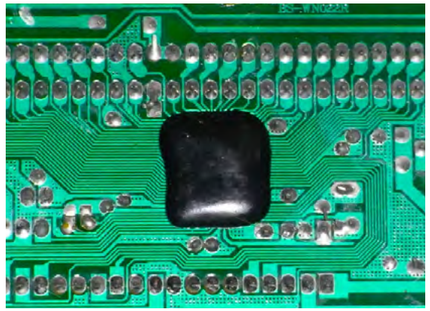
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ENCAPSULATION RESINS AND GELS

ENCAPSULATION RESINES AND GELS







Encapsulation resins and gels offer excellent protection and ruggisation of electronics from harsh environmental conditions, from permanent submersion in water or oils through to drop shock and high vibration. They are typically applied (at a minimum of) 5mm above the top of the highest electronic component and can prevent intellectual property (IP) theft. Encapsulation resins are harder than gels, which can be a benefit when ultimate protection is required. Gels, on the other hand, can be re-enterable and reworkable. Both solutions help to extend the lifespan and reliability of electronics.

9. Two-Part RTV Cure Encapsulation Resins

Two-part RTV encapsulation resins vary in properties from viscosity to thermal conductivity. They are nearly always suitable for high operating temperatures, and additional heat can often accelerate the cure.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Curing time	Mix ratio	Shore hardness	Pot life
SILICONE									
Sylgard® 160	Thermal conductivity 0.58 W/m.K.	UL 94 V-0 • UL RTI 150	**-45°C** to **200°C**	4,500	Dark Grey to Black	24h at 25°C 4 min at 100°C	1:1	56A	20 mins
Sylgard® 164	Fast RTV cure version of Sylgard 160 - Thermal conductivity 0.64 W/m.K.	UL 94 V-0 • UL RTI 150	**-45°C** to **200°C**	9,100	Grey	36 min at 25°C - heat accelerable	1:1	61A	14 mins
Sylgard® 170	Thermal conductivity 0.48 W/m.K.	UL 94 V-0 • MIL-SPEC • UL RTI 170 • EN45545 • R22,R26 HL3	**-45°C** to **200°C**	2,100	Dark Grey to Black	24 hours at 25°C 25 mins at 70°C 10 mins at 100°C	1:1	47A	15 mins
Sylgard® 170 Fast Cure	Much faster curing version of Sylgard 170 - Thermal conductivity 0.4 W/m.K.	UL 94 V-0	**-45°C** to **200°C**	2,300	Black	12 mins at 25°C - - heat accelerable	1:1	41A	4 mins
Sylgard® 182	Long workingtime.	UL 94 V-1 • UL RTI 150	**-45°C** to **200°C**	5,700	Optically Clear	14 days at 25°C 75 min at 100°C 20 min at 150°C	10:1	51A	8 hours
Sylgard® 184	faster curing version of Sylgard 182.	UL 94 V-1 • MIL-SPEC • UL RTI 150	**-45°C** to **200°C**	3,500	Optically Clear	48h at 25°C 35 min at 100°C 10 min at 150°C	10:1	43A	1.5 hours
Sylgard® 186	Very tough - controlled volatility.	UL 94 V-1 • UL RTI 150	**-45°C** to **200°C**	65,000	Translucent	48h at 25°C 25 min at 100°C 15 min at 150°C	10:1	24A	2 hours
Dowsil™ CN-8760	Fast filling rates - reduced price - Thermal conductivity 0.66 W/m.K.	UL 94 V-0	**-45°C** to **200°C**	2,700	Dark Grey	24h at 24°C 40min at 50°C	1:1	55A	1.5 hours
RTV-9161	Mix ratio tunable .	-	**-50°C** to **250°C**	13,000	White	1-4h at 25°C	20:1	42A	15 mins

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10. Two-Part Heat Cure Encapsulation Resins

Heat curing can be beneficial when filling large units or using the material manually. Benefiting from excellent flexibility, high operating temperatures, and long pot life, heat cure encapsulation resins are widely used for their chemical and mechanical resistance.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Shore hardness	Time to polymerization	Dielectric Strength(kV/mm)	Pot life
SILICONE									
Sylgard® 567	Self-priming.	UL 94 V-0 • MIL-SPEC • UL RTI 150	**-45°C** to **200°C**	1,500	Black	40A	120 mins at 100°C 15 mins at 150°C	16	3 days
Dowsil™ SE 1819 CV	Controlled volatility . Self-priming . Low density.	UL 94 V-0	**-45°C** to **200°C**	2,600	White	36A	60 mins at 100°C	28	8h
Dowsil™ Q3-3600	Two components (1:1) • Without primer • Thermal conductivity 0.8 W/m.K.	UL 94 V-1	**-45°C** to **200°C**	3,2	Grey	89A	60 mins at 150°C	26	24h
EPOXY									
Araldite® CW 229-3 Aradur® HW 229-1	Excellent crack and thermal shock resistance. Indoor electrical insulation material for postinsulators, equipment parts, bushings, instrument and dry type distribution transf ormers, switchgears, etc.	Class H (180°C)	**-60°C** to **200°C**	2	Brown	90D	8 hours at 140°C	8	
Araldite® CW5725-3 Aradur® HY5726	Very low viscosity.	Class H (>180C°) • UL 94 HB	**-50°C** to **181°C**	470	Black	90D	2.5 hours at 90°C + 2.5h at 130°C	480 mins	
Araldite® CW 1446BDF Aradur® HY 2919-1	Low viscosity	Class H (>180°C) • UL 94 V-0	**-40°C** to **181°C**	300	Brown	77D	5.5 hours at 100°C	220 mins	
Araldite® CW 5730N Aradur® HY 5731	Semi-rigid.	Class F (155°C) • UL 94 V-0	**-40°C** to **155°C**	650	Black	70D	3 hours at 80°C + 6 hours at 100°C	380 mins	

11. Two-Part Encapsulation Resins

Room temperature cure encapsulation resins allow for convenience as they eliminate the need for specialist curing and heating equipment. For maximum ease of application, these encapsulation resins typically offer user-friendly mixing and application processes.

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	TG (°C)	Shore hardness	Usable Life at 20°C (min)
EPOXY									
Araldite® CY 221 Aradur® HY 2966-2	Low viscosity, unfilled casting resin with good heat, chemical and crack resistance .	Class B (130°C) UL 94 HB (6 mm)	**-40°C** to **130°C**	700	Transparent	24-48 hours at RT or 4 hours at RT + 4 hours at 60°C	30	37D	110 (25°C)
Araldite® CY 221 Aradur® HY 956	Transparent, low viscosity, unfilled casting resin with good heat, crack resistance and atmospheric and chemical degradation.	UL 94 HB (6 mm)	**-40°C** to **130°C**	450 (25°C)	Transparent	24-48 hours at RT or 4 h at RT + 4 hours at 60°C	23	34D	87 (40°C)
Araldite® CW 2243-2 L Aradur® HY 842	Semi-rigid resin • Low viscosity.	Class B (130°C) UL 94 V-0 (6 mm) EN 45545-2: R22/R23 HL1/HL2	**-40°C** to **130°C**	2,600	Blue	24 hours at RT or 6 hours at 60°C	22	41D	180 (25°C)
Araldite® CW 2243-2 L Aradur® HY 2966-2	Semi-rigid resin • Low viscosity.	Class B (130°C) UL 94 V-0 (6 mm)	**-40°C** to **130°C**	2,600 .	Blue	24 hours at RT or 6 hours at 60°C	33	70D	20 (25°C)
Araldite® CW 1312 Aradur® HY 1300	Thermal conductivity 1.1 W/m.K.	Class B (130°C) UL 94 V-0 (6 mm) EN 45545-2: R22/R23 HL1/HL2	**-40°C** to **130°C**	2,600	Beige	48 hours at 25°C or 24 hours at RT + 6 hours at 60°C	21	57D	50 (40°C)
Araldite® CW 1302 Aradur® HY 1300	Thermal conductivity 0.88 W/mK.	Class H (180 °C) UL 94 V-0 (6 mm) EN 45545-2: R22 HL2 / R23 HL3	**-40°C** to **181°C**	2,600 2.13	Beige	48 hours at 25°C or 24 hours at RT + 6 hours at 60°C	75	88D	37 (40°C)
Araldite® MY 757 Aradur® HY 842	Unfilled resin • Semi-rigid.	-	**-40°C** to **130°C**	2,600	Translucent Brown	24-36 hours at 25°C or 4-6 hours at 60°C	40	65D	195 (25°C)
Araldite® MY 757 Aradur® HY 956	Unfilled resin • Rigid.	-	**-40°C** to **130°C**	2,600	Translucent	24 hours at 25°C or 2-3 hours at 60°C	50	75D	94 (25°C)
Araldite® DBF Aradur® HY 842	Unfilled semi-rigid resin Low viscosity.	-	**-40°C** to **120°C**	2,600	Transparent	24-48 hours at RT or 4 hours at RT + 4 hours at 60°C	37	64D	129 (25°C)
Araldite® DBF Aradur® HY 956	Low viscosity, unfilled casting resin with good heat, atmospheric and chemical degradation.	-	**-40°C** to **120°C**	2,600	Transparent	24-48 hours at RT or 4 hours at RT + 4 hours at 60°C	64	80D	70 (25°C)
Araldite® X 2252-1 XB 2253-1	Good thermal shock resistance and good dielectric and mechanical properties.	Class H (180°C) UL 94 V-0 (6 mm) EN 45545-2: R22 HL1 / R23 HL2	**-40°C** to **180°C**	2,600	Black	24 hours at RT or 6 hours at 60°C	60	85D	67 (40°C)

Product	Description	Standards / Approvals	Operating Temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	TG (°C)	Shore hardness	Usable Life at 23°C (min)
POLYURETHANES									
Arathane® CW 5620 Arathane® HY 5610	Multipurpose system with excellent flow properties, non abrasive and good thermal shock resistance. Blue and Dark Grey.	Class B (130°C) UL 94 V-0 (10 mm), only blue version	**-40°C** to **152°C**	1,300	Blue/Black	24 hours at RT or 6 hours at 80°C	20	85A	25 (25°C)
Arathane® CW 5660 Arathane® HY 5610	Flexible even at low temperatures. Flame retardant, high thermal conductivity and excellent thermal resistance. Solar inverters, modules, pressure sensitive devices.	Class F (155°C) UL 94 V-0 (6 mm)	**-50°C** to **165°C**	2,000	Black	24 hours at RT or 6 hours at 80°C	-16	85A	60 (40°C)
Arathane® CW 5631 Arathane® HY 5610	High thermal resistance. Excellet flow properties. Good thermal shock resistance. Transformers, filters, capacitors, electrical devices working in potentially explosive environment.	Class F (155°C) UL94 V-0 (6 mm)	**-40°C** to **155°C**	3,000	Black	24 hours at RT or 6 hours at 80°C	47	80D	14
Arathane® XW 949-1 Arathane® HY 5610	Unfilled. Flexible system for pressure sensitive devices. Excellent dielectric properties, good thermal shock resistance. Low glass transition temperature. Modules, proximity switches.	Class B (130°C)	**-40°C** to **130°C**	1,800	Blue	24 hours at RT or 6 hours at 80°C	-62	70A	17

12. UV Cure Encapsulation Resins and Gels

UV cure encapsulation resins and gels benefit from fast cure time on exposure to a UV lamp, allowing the electronic unit to reach the next production stage almost immediately. Ensuring the correct type of UV curing lamp is essential to obtaining the complete technical properties of the material used. Many UV cure encapsulation resins and gels also contain a secondary moisture cure mechanism.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Cure Time	Max Gap (mm)	Fixation Time (4mW/cm)	Tensile (MPa)	Shore hardness	Elongation at break
CYANOACRYLATE +											
Born2Bond Light Lock MV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	180 - 220	Transparent/ Greenish	10 secs	0.15	5 secs	30	81D	1.0%
Born2Bond Light Lock HV	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	600 - 900	Transparent/ Yellowish	10 secs	0.3	5 secs	29.2	76D	1.5%
Born2Bond Light Lock Gel	Low odour, low blooming, dual curing (contact and light) adhesive. Rapid bonding in both transparent and shadow areas. Gap filling capacity.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **80°C**	30,000 - 45,000	Transparent/ Greenish	15 secs	10	5 secs	25	78D	0.1%
Born2Bond Light Lock 30X	Low odour, low blooming, dual curing, hybrid cyanoacrylate - acrylate adhesive. Rapid, tough and flexible bonding on transparent and shadowed areas.	BIOCOMPATIBLE (ISO 10993)	**-40°C** to **60°C**	150 -350	Transparent/ Greenish	10 secs	0.15	5 secs	38	60 - 65D	120%

13. Two Part RTV Cure Gels

While designed to be cured at room temperature, two-part RTV cure gels can (in general) be cured faster with the addition of heat, giving flexibility to production throughput or the need for ovens. Two-part RTV cure gels are some of the softest gels measuring down to the low shore 00 region. This soft shore hardness can be especially beneficial when protecting exceptionally delicate components.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	colour	Mix ratio	Shore hardness	Pot life	Time to polymerization
SILICONE									
Dowsil™ 3-4207	Silicone gel effectively seals and shields PCB system assemblies from environmental factors, ensuring their longevity and reliability.	UL 94 V-1 • UL RTI 150	**-45°C** to **200°C**	430	Translucent Green	1:1	60 OO	< 10 mins	1 hours 30 mins at 25°C 10 mins at 50°C
Dowsil™ 3-4222	Silicone gel is employed to insulate electrical elements and safeguard them from pollutants, moisture, and mechanical strain.	-	**-45°C** to **200°C**	325	Translucent Green	1:1	35 OO	< 5 mins	30 mins at 25°C - 2 mins at 100°C
Dowsil™ 3-4241	Rapidly curing tough gel featuring UV indicator, conditional primerless adhesion, and strong flame resistance.	UL 94 V-1 • UL RTI 150	**-45°C** to **200°C**	420	Translucent Green	1:1	60 OO	>1 hour	11 hours at 25°C 2 mins at 125*C
Dowsil™ EE-3200	Possesses exceptionally low hardness and viscosity, reducing internal stress, filling minor gaps, and enhancing manufacturing efficiency for intricate and high-volume electronic devices.	UL 94 V-0 • UL RTI 150 • EN45545 (R22 to R26 HL3)	**-45°C** to **200°C**	1,700	Black	1:1	20 OO	30 mins	3 hours at 25°C 20 mins at 50°C
Dowsil™ 3-4150	It offers more processing flexibility with the options of room temperature with no need for ovens or heat-accelerted cure if faster processing is desired.	-	**-45°C** to **200°C**	475	Translucent Green	1:1	110	7 mins	1 hours 30 mins at 25°C
Dowsil™ Q3-6575	Gel encapsulants designed for low temperature applications provide effective protection and insulation for electronic components, even in environments where traditional materials might fail to perform optimally due to temperature fluctuations.	-	**-45°C** to **200°C**	750	Translucent	1:1	80	20 mins	24 hours at 25°C 40 mins at 70°C 20 mins at 100°C
Dowsil™ 3-4155 HV	It exhibits the stability of their properties at temperatures down to -80°C allowing PCB system assemblies to operate at these extreme temperatures.	-	**-45°C** to **200°C**	1,875	Translucent Green	1:1	85	8 mins	1 hour at 25°C
Dowsil™ EI-2888	Optically clear. LED encapsulation - primerless.	UL94 / UL746CF1	**-45°C** to **200°C**	2,700	Transparent	1:1	10A	130 mins	24 hours at 25°C

14. Heat Cure Gels

Heat cure gels come in one and two-part variants, with one-part materials often being simpler to apply in production and two-part systems curing at lower temperatures, benefitting temperature-sensitive components. Gels are always a good option when you have a mismatched CTE, as they can easily absorb the stresses caused by changes in temperature without transferring them to the electronic components or unit.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix ratio	Gel hardness (g)	Pot life	Time to polymeriz ation
SILICONE									
Dowsil™ 3-6635	Fast filling automotive grade, designed for use down to -80°C.	UL-94 HB	**-80°C** to **200°C**	700	Transparent	1-part	80	N / A	48 mins at 100°C 6.6 mins at 125°C
Sylgard® 517	Dielectric gel suitable for sealing and protecting various electronic devices, especially those with delicate components.	-	**-45°C** to **200°C**	450	Transparent	1:1	-	16 hours	4 hours at 65°C / 1 hour at 100°C / 15 mins at 150°C

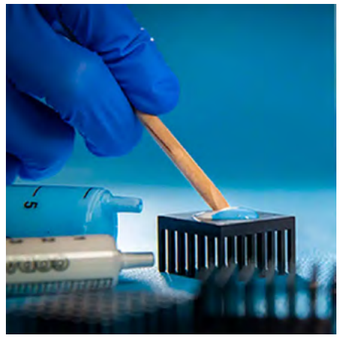
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Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix ratio	Gel hardness (g)	Pot life	Time to polymeriz ation
Sylgard® 527	Dielectric gel that is suitable for sealing and protecting various electronic devices, especially those with delicate components.	UL-94 HB	**-45°C** to **200°C**	465	Transparent/ Red	1:1	115	2 hours	210 mins at 100°C 75 mins at 125°C / 35 mins at 150°C
Sylgard® 537	One-part gel with no mixing required. Suitable for potting various electronic devices.	-	**-45°C** to **200°C**	375	Transparent	1-part	290	N / A	60 mins at 120°C
Dowsil™ 3-4154	Longer processing time version of 3-4150 (RTV).	-	**-45°C** to **200°C**	550	Transparent	1:1	100	30 mins	3 hours at 80°C 105 mins at 100°C

THERMAL MANAGEMENT

THERMAL MANAGEMENT







Problems created by increased heat exposure are prevalent in modern electronics due to miniaturisation and increased demands on upper operating temperatures. Thermal management materials are an excellent way to help mitigate this. They come in numerous forms but act uniformly, drawing heat away from electronic components to a heat sink or metal housing. Air is a poor conductor of heat, and whilst air impedes heat transfer, strategic use of a thermal management material allows for its complete removal from the heat path, helping to improve the lifetime and reliability of electronics by reducing the chance of burnout.

15. Thermally Conductive Pastes

Thermal pastes are one-part, non-curing materials, generally designed to sit between a component and a heat sink or external metal housing. As a general rule, they work best in small gaps up to 1mm, and as they do not cure, they can suffer from pump out if in a high-vibration environment or an orientation where movement of the material is likely. They are easy to use both in manual and automated manufacturing setups.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Conductivity Thermal (W/m.K)	Thermal resistance at 40 psi (°C.cm²/W)	Dielectric Strength (kV/mm)
SILICONE								
Dowsil®TC-5622	Designed to provide efficient thermal transfer for the cooling of modules, including computer MPUs and power modules.	–	**-50°C** to **177°C**	95,000	Grey	4.3	0.06	NC
Dowsil®TC-5351	Suitable for use as a thermally conductive material in power electronics.	–	**-50°C** to **177°C**	300,000	Grey	3.3	0.25	6.3
Dowsil®TC-5629	Excellent thermally conductive solution for LED lightings and other electronics applications.	–	NC	295,000	Grey	3.2	N/A	6.3
Dowsil®SC-4476	Efficient thermal transfer for the cooling of PCB system assemblies, including sensors in consumer devices.	–	NC	310,000	Grey	3.1	N/A	25
Dowsil®TC-5026	Designed to provide efficient thermal transfer for the cooling of MPU in servers, desktops, notebooks, and game consoles.	–	NC	100,000	Grey	2.9	0.03	8.9
Dowsil®TC-5121 C LV	Designed to provide efficient thermal transfer for the cooling of MPU in servers, desktops, and notebooks.	–	**-50°C** to **177°C**	79,000	Grey	2.8	0.09	1.9
Dowsil®SE 4490 CV	Designed to provide efficient thermal transfer for the cooling of automotive control modules, power supplies and driver IC's for displays.	–	**-50°C** to **177°C**	520,000	White	1.9	0.77	4

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Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Conductivity Thermal (W/m.K)	Thermal resistance at 40 psi (°C.cm²/W)	Dielectric Strength (kV/mm)
Dowsil®TC-5080	Suitable for use as a thermal interface material for lighting assemblies, telecom equipment, consumer devices, power supplies and power components for transportation.	–	**-50°C** to **177°C**	836,000	White	1	0.2	8.7
Dowsil®SC 102	Designed for the cooling of PCB system assembly modules used in computer, power supply, and automotive applications.	–	**-50°C** to **177°C**	29,000	White	0.9	0.62	2
Dowsil®340 Heat Sink Compound	Designed for thermal coupling of electrical devices and PCB assemblies to heat sinks.	–	**-50°C** to **177°C**	542,000	White	0.67	0.16	8

16. Thermally Conductive Gap Fillers

Gap fillers are typically applied in gaps over 1mm and are generally two-part materials which cure once mixed. They work in the same way as thermal pastes but rarely suffer from pump out as while they are not adhesives, they remain tacky and stick to the substrates they are placed between. These properties mean they are frequently used in more challenging automotive environments.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Conductivity Thermal (W/m.K)	Shore hardness	Time to polymerization	Rigidity Dielectric (kV/mm)
SILICONES									
Dowsil®TC-4525 CV	Silicone designed to dissipate the heat from components mounted on printed circuit board to heat sink providing a reliable cooling solution for modules like an engine or transmission control unit.	UL94 V-0	**-45°C** to **150°C**	217,000	White/Blue	2.5	40 OO	120 mins at 25°C 20 min sat 50°C 10 mins at 80°C	12
Dowsil®TC-4015	Thermal pads for computer microchips and power supplies facilitate heat dissipation, ensuring reliable performance and easy assembly.	UL94 V-0	**-45°C** to **150°C**	180,000	White/Blue	1.5	55 OO	150 mins at 25°C 30 mins at 80°C	15.8
Dowsil®TC-4535 CV	Designed to dissipate the heat from PCB module assemblies mounted on printed circuit board to heat sink providing a reliable cooling solution for modules like an engine or transmission control unit.	UL94 V-0	**-45°C** to **200°C**	205,000	White/Blue	3.4	52 OO	120 mins at 25°C	22

17. Thermally Conductive Encapsulation Resins

Electronic units – rather than specific components – can also suffer from too much heat, causing premature ageing or failures. Thermally conductive encapsulation resins combat the complexities that arise when electronics require heat removal and protection from harsh environments.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Type of adhesive	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Time to polymerization	Rigidity Dielectric (kV/mm)
Polymerization at room temperature and accelerated when hot											
Dowsil® TC-6020	Suitable for Indutry power module, automotive control unit thermal management.	UL94 V-0 & UL RTI 150°C	**-45°C** to **200°C**	10,640	Grey	Silicone	1:1	2.72	63A	24 hours at 25°C 13 mins at 80°C	24.1
Araldite® CW 1312 Aradur® HY 1300	Rail and automotive applications include bonding induction components, transformers, generators and motors, pressure-sensitive components. Good thermal shock resistance.	CLASS B (130°C) UL 94 V-0 (6.0 mm) EN 45545-2: R22/23 HL1/HL2	**-40°C** to **130°C**	3,500 (40°C)	Beige	Epoxy	100:9	1.1	57D	48 hours at 25°C or 24 hours at RT + 6 hours at 60°C	15
Dowsil® TC-4605	Encapsulant/pottant for electronics, providing protection from different environmental conditions and thermal management.	-	**-45°C** to **200°C**	2,900	Grey	Silicone	1:1	1	30A	1 hour at 120°C	21
Dowsil® SE 4430	Used for cooling electronic modules in power supply applications.	-	**-45°C** to **200°C**	6,700	Grey	Silicone	1:1	0.96	70 OO	7 hours at 25°C 2 mins at 150°C	18
Araldite® CW 1302 Aradur® HY 1300	Rail and automotive applications include transformers, filters, capacitors. Low water absorption, excellent thermal endurance. Suitable for explosion-proof castings.	CLASS H (180°C) UL 94 V-0 (6 mm) EN 45545: R22 HL2 / R23 HL3	**-40°C** to **181°C**	3,500 (40°C)	Beige/ Grey	Epoxy	100:11	0.88	88D	48 hours at 25°C or 24 hours at RT + 6 hours at 60°C	27
Arathane® CW 5660 Arathane® HY 5610	Flexible sistem even at low temperatures, excellent thermal resistance. It contains non-abrasive fillers. Solar inverters, modules and pressure sensitive devices.	CLASS F (155°C) UL 94 V-0 (3 mm)	**-50°C** to **165°C**	2,000 (25°C)	Black	Polyuretha-ne	100:13	0.7	85A	24 hours at RT or 6 hours at 80°C	19
Araldite® XB 2252-1 XB 2253-1	Optimally filled casting system for transformers, filter, capacitors.	CLASS H (180°C) UL 94 V-0 (6 mm) EN 45545: R22 HL1 / R23 HL2	**-40°C** to **180°C**	1,900 (25°C)	Black	Epoxy	100:13	0.66	85D	24 hours at 25°C or 24 hours at RT + 6 hours at 60°C	29
Dowsil® CN-8760	Designed for photovoltaics, inverters, power units and sensors.	UL94 V-0	**-45°C** to **200°C**	2,850	Grey	Silicone	1:1	0.66	52A	24 hours at 25°C 40 mins at 50°C	26
Dowsil® Sylgard 164	Suitable for general potting material for power supplies, connectors, sensors, industrial controls, transformers, amplifiers, high voltage resistor packs and relays.	UL94 V-0 & UL RTI 150°C	**-45°C** to **200°C**	9,100	Grey	Silicone	1:1	0.64	61A	40 mins at 25°C	19

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Type of adhesive	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Time to polymerization	Rigidity Dielectric (kV/mm)
Dowsil® Sylgard 160	Suitable for general potting material for power supplies, connectors, sensors, industrial controls and transformers.	UL94 V-0 & UL RTI 150°C	**-45°C** to **200°C**	4,865	Grey	Silicone	1:1	0.62	56A	24 hours at 25°C 4 mins at 100°C	19
Dowsil® EE-3200	Successfully tested in solar power inverters, where it offers the best protection of sensitive components against repeated mechanical and thermal stress, as well as humidity and other punitive environmental factors.	UL94 V-0 & UL RTI 150°C; EN45545: R22 to R26 HL3	**-45°C** to **200°C**	1,700	Grey	Silicone	1:1	0.5	20 OO	3 hours at 25°C 20 mins at 50°C	14
Dowsil® Sylgard 170	Suitable for use as an encapsulant or potting material.	UL94 V-0; MIL Spec	**-45°C** to **200°C**	2,135	Grey	Silicone	1:1	0.48	47A	24 hours at 25°C 10 mins at 100°C	18

18. RTV Thermally Conductive Adhesives

Electronic units – rather than specific components – can also suffer from too much heat, causing premature ageing or failures. Thermally conductive encapsulation resins combat the complexities that arise when electronics require heat removal and protection from harsh environments.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Thermal Conductivity (W/m.K)	Shore hardness	Tensile strength (MPa)	Elongation (%)	Rigidity Dielectric (kV/mm)
SILICONE											
Dowsil® SE 4485	Designed for the cooling of modules, including lamp, telecom, and power supply devices.	UL94 V-0	**-45°C** to **200°C**	N / A	White	1-part	2.8	90A	3.4	20	19
Dowsil® SE4485L	Designed for the cooling of modules, including lamp, telecom, and power supply devices.	-	**-45°C** to **200°C**	N / A	White	1-part	2.2	90A	5.1	20	38
Dowsil® SE 4486 CV	Designed for the cooling of electronic modules, including home appliance devices. Moisture cure RTV, highly flowable, fast tack-free, high thermally conductive adhesive with controlled volatility.	-	**-45°C** to **200°C**	19600	White	1-part	1.6	81A	3.9	43	20
Dowsil® SE 4420	Designed for the cooling of electronic modules, including telecom and power supply devices. Moisture cure RTV, flowable, thermally conductive silicone adhesive.	-	**-45°C** to **200°C**	108000	White	1-part	0.92	76A	4.1	77	14.6
Dowsil® EA 9189H	Alkoxy cure RTV adhesive used as a module assembly adhesive.	UL94 V-0	**-45°C** to **200°C**	N / A	White	1-part	0.88	80A	3.9	32	28
Dowsil® SE 9184	Designed to provide adhesion and thermal transfer for the cooling of various electrical components.	UL94 V-0	**-45°C** to **200°C**	N / A	White	1-part	0.84	74A	3.2	60	20

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Thermal Conductivity (W/m.K)	Shore hardness	Tensile strength (MPa)	Elongation (%)	Rigidity Dielectric (kV/mm)
EPOXY											
Permabond®ET5441	Thixotropic, thermally conductive 2P epoxy adhesive. Excellent resistance to high temperature, to motor, oil, glycol and hot and cold water.	UL94 HB ECSS-Q-ST-70-02C	-45°C to 200°C	24.000	Light Grey	2:1	1.1	90D	?	2.9	22
MS POLYMER											
Permabond®MT3836	2P modified hybrid silane polymer adhesive for sealing and bonding applications. Excellent adhesion to PC, ABS, Nylon and other plastics as well as a variety of different metals.	UL94 V-0	-45°C to 90°C	333.330	Cream/ Yellowish	2:1	1.05	-	2	>100	18 - 20

19. Heat Cure Thermally Conductive Adhesives

Heat cure thermally conductive adhesives provide high thermal conductivity for efficient heat dissipation and strong bonds for increased reliability. Heat curing enables faster cure times and a more predictable and controllable cure process. However, more safety precautions may be required when heat curing.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Tensile strength (MPa)	Elongation (%)	Time to polymerization	Rigidity Dielectric (kV/mm)
SILICONE												
Dowsil®TC-2035	Designed to provide long term bonding and efficient thermal flow, especially where low bond line thickness is required to enhance thermal conductivity.	-	-45°C to 200°C	125	Red	2-part	3.3	95A	3.6	43	30 mins at 125°C/10 mins at 150°C	21
Dowsil®TC-2035 CV	A new high thermal conductivity product with low temperature, fast cure and outstanding room temperature shelf-life stability for auto-motive electronic assembly applications. This technology enables low carbon mobility.	-	-45 to 200°C	345	White / Reddish Brown	2-part	3.3	33A	3,7	50	15 mins at 115°C	22
Dowsil® TC-2030	Suitable for bonding electrical components and boards and providing efficient thermal transfer.	-	-45°C to 200°C	220	Grey	2-part	2.7	92A	4.7	50	60 mins at 130°C	21
Dowsil®SE 4450	Designed to provide efficient thermal transfer for the cooling of chip packaging as TIM 1.	-	-45°C to 200°C	66	Grey	1-part	1.92	95A	6.7	46	30 mins at 150°C	22
Dowsil®1-4173	Suitable for bonding integrated circuit subs-trates, adhering lids and housings, base plate attach and heat sink attach, automated or manual dispensing.	UL94 V-0	-45°C to 200°C	61	Grey	1-part	1.8	92A	6.2	20	90 mins at 100°C	16.7

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Tensile strength (MPa)	Elongation W(%)	Time to polymerization	Rigidity Dielectric (kV/mm)
Dowsil®1-4174	Suitable for bonding integrated circuit substrates, adhering lids and housings, base plate attach and heat sink attach. Glass beads allow uniform, easily controlled bond line thickness.	UL94 V-0	-45°C to 200°C	62.3	Grey	1-part	1.78	A92	6.2	22	90 mins at 100°C	16
Dowsil®3-6752	Bonding organic and ceramic substrates to heat sinks for electronic control modules in automotive applications. Flame resistance.	-	-45°C to 200°C	81	Grey	1-part	1.7	A87	3.76	15	3 mins at 150°c	15.7
Dowsil®3-6753	Designed for the cooling of PCB system assembly modules in automotive applications. 7 mil glass beads for controlled Bond Line Thickness.	-	-45°C to 200°C	10,120	Grey	2-part	1.1	A69	2.8	36	10 mins at 150°C	18
Dowsil®3-6751	Designed for the cooling of componentss in power supply, consumer devices, and automotive applications.	UL94 V-0	-45°C to 200°C	9.3	Grey	2-part	1	A68	2.8	36	10 mins at 150°C	18
Dowsil®Q1-9226	Includes bonding organic and ceramic substrates to heat sinks for control modules in automotive applications.	-	-45°C to 200°C	59	Grey	2-part	0.8	A67	4.15	120	30 mins at 150°C	25
EPOXY												
Permabond®ES578	Designed for applications requiring heat dissipation such as bonding aluminum heat sinks to ceramic headers.	-	-40°C to 140°C	600,000 - 800,000	Black	1-part	1.3	D84	35 - 40	2%	60 mins at 130°C 30 mins at 150°C	17.7

20. Thermally Conductive Printable Pads

Printable pads are available in one and two-part systems and are ideal for applications where controlled thickness is a must, and many contain glass beads to assist with this. Generally, printable pads cure both at room temperature and with heat to form an easily removable 'pad' similar to traditional thermal gap pads, making them easy to rework and not susceptible to pump out.

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Time to polymerization	Rigidity Dielectric (kV/mm)
SILICONE										
Dowsil®TC-4026	Cooling pcb system assemblies in LED lamps and luminaries, automotives, and consumer applications. Applications requiring screen printing and/or dispensable materials. Applications to replace a traditional fabricated pad. With glass beads to help control thickness during dispense, cure, and application.	UL94 V-0 & UL RTI 150°C	-45°C to 200°C	70	Blue	2-part	2.5	50 OO	24 hours at 25°C 40 mins at 75°C 15 mins at 100°C	18
Dowsil®TC-4025	Suitable thermal interface material for telecom devices, lamps and luminaires. Printable or dispensable pad to replace traditional fabricated pad. Gap filler.	UL94 V-0 & UL RTI 150°C	-45°C to 200°C	70	Blue	2-part	2.5	50 OO	24 hours at 25°C 40 mins at 75°C 15 mins at 100°C	18

Product	Description	Standards / Approvals	Operating temperature (°C)	Viscosity (mPa.s) at 23°	Colour	Mix Ratio	Conductivity Thermal (W/m.K)	Shore hardness	Time to polymerization	Rigidity Dielectric (kV/mm)
Dowsil®TC-4016	Blue Silicone • Two-component (1:1) • With glass beads* • Standards: UL94 V-0 & UL RTI 150°C I CANNOT FIND IT WITHIN DOW'S WEBPAGE.	UL94 V-0 & UL RTI 150°C	**-45°C** to **200°C**	103	Blue	2-part	1.7	50 OO	24 hours at 25°C 48 mins at 75°C 16 mins at 100°C	18
Dowsil®TC-4015	Thermal pads for computer microchips and power supplies facilitate heat dissipation, ensuring reliable performance and easy assembly.	UL94 V-0 & UL RTI 150°C	**-45°C** to **200°C**	103	Blue	2-part	1.7	50 OO	24 hours at 25°C 48 mins at 75°C 16 mins at 100°C	18
Dowsil® TC-3015	Conductive gel for thermal management of smartphone components with good re-workability.	-	**-45°C** to **200°C**	220000	Light Pink	1-part	2	72 OO	8 hours at 60° 60 mins at 100°	14,7