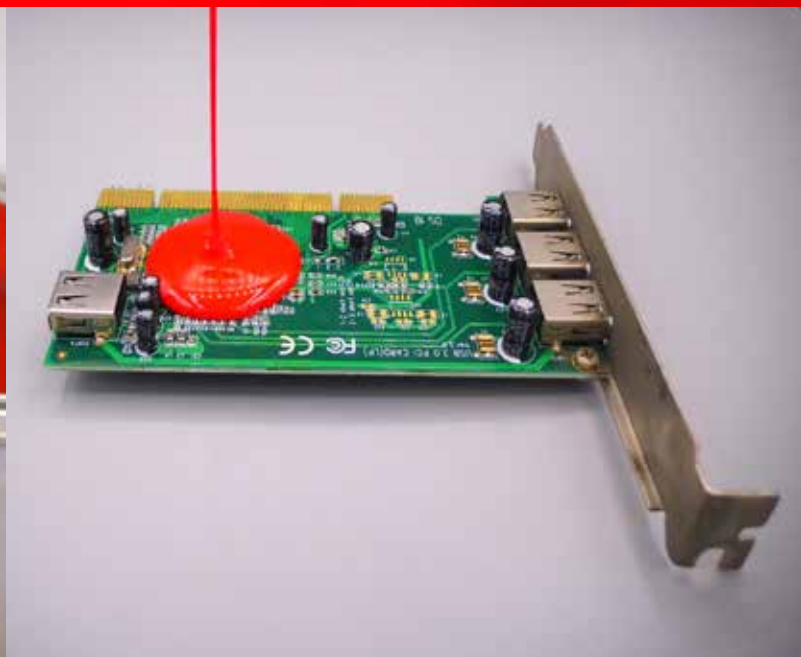


Overview Encapsulants



**BONDING +
SEALING +
ENCAPSULATION**

Kisling

MEMBER OF THE WÜRTH  GROUP

Driving innovation with pioneering spirit.

Founded in Switzerland - operating internationally: We have been on the market since 1862 and today are one of the leading manufacturers of high-quality adhesives and sealants as well as encapsulants for almost all industries, OEM manufacturers and retailers.

Our product range comprises (meth)acrylate structural adhesives, epoxy structural adhesives, anaerobic adhesives, cyanoacrylate instant adhesives, silicones, hybrid polymers and encapsulants for a wide range of applications. We also develop application-specific product solutions at our customers' request.

Our customers are leading companies from sectors including:

- + **Lightweight Materials & Composites**
- + **E-Mobility & Electric Motors**
- + **Electronics**
- + **Fluid Technology**
- + **Transportation**
- + **Automotive**
- + **Loudspeakers**
- + **Maintenance, Repair and Overhaul (MRO)**

Resellers who market our products under their own brands have also trusted Kisling's solutions for many years. Highly professional application advice and extensive service are also part of our daily offer as well as the production of our products in-house.



Customer-specific adhesives, sealants and encapsulants without compromise.

Every demanding application has its own specific challenges for the adhesives, sealants and encapsulants used in it. With us you can be assured that your desired parameters are 100% fulfilled, thanks to products that are custom-made to your requirements.

Special solutions by professionals for professionals

These are developed by our specialists in close collaboration with your team – from product development up to the processing technology, because we are more than just a supplier. We are your partner for individual adhesive, sealing and encapsulant solutions. And all of it with trusted and certified Kisling quality.

Innovation meets individuality

We have already developed more than 30 unique and innovative adhesives, sealants and encapsulants for customers in industries such as IT, electronics, automotive and plumbing.



Environmental protection and safety.

Safety, quality and the judicious use of natural resources are all as central to our corporate philosophy as the Matterhorn is to Switzerland. For decades, therefore, we have developed and marketed many hazard label-free products, while complying with all international quality standards and guidelines.

The Kisling sustainability label

All hazard label-free adhesives and sealants are marked with the Kisling sustainability label. This label stands for highest quality, performance and sustainability throughout all stages of the product lifecycle – from procurement and production through processing to disposal.

Our path to sustainable development

Human – environment – business relationships: it is our responsibility of truly embodying sustainability at all these levels. Whether it is the constant protection and continuing training of our employees, the installation of solar panels on the roof of our headquarter in Wetzikon or by means of our code of compliance – to name just a few examples.



ADHESIVES, SEALANTS + ENCAPSULANTS WITHOUT HAZARD LABELS

The use of adhesives and sealants as well as encapsulants may bear some risks for human health and the environment. Reactive materials often contain substances that can cause skin irritation and allergies. The use therefore requires special health and safety precautions. Employers in all countries are obliged by national legislation to implement health and safety measures. Article 6 of European directive 89/391/EEC sets out these obligations.

CMR-FREE ENCAPSULANTS

Which substances are CMR materials? Substances that are carcinogenic, mutagenic or toxic to reproduction have additional hazard potential. They are called CMR substances (carcinogenic, mutagenic and toxic to reproduction). The safety of our customers and our own employees has the highest priority for us. This is why we have our (thermally) conductive encapsulants as a „CMR-free“ version in our product portfolio. Only materials that are **not** suspected of being carcinogenic are used. Of course, the excellent thermal conductivity, e.g. thermal conductivity or processing properties, are retained.



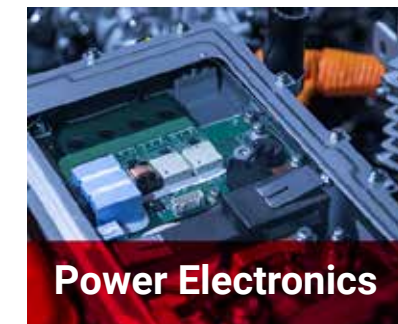
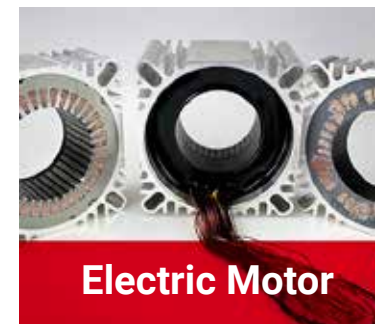
REASONS WHY TO WORK WITH KISLING PRODUCTS

- + Enhanced health and safety at work
- + Skin irritations and allergies are minimised
- + Less loss of work due to illness
- + Reduced environmental burden
- + Very wide selection for diverse applications
- + The right solution even for demanding applications

MARKETS AND APPLICATIONS

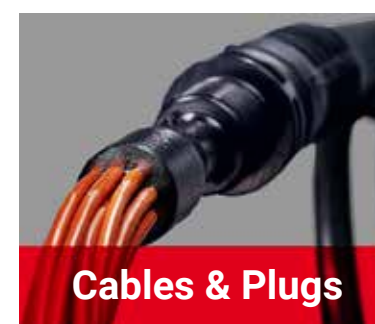
E-MOBILITY

TECHNOLOGY FOCUS: THERMAL CONDUCTIVITY & HEAT DISSIPATION



ELECTRONICS

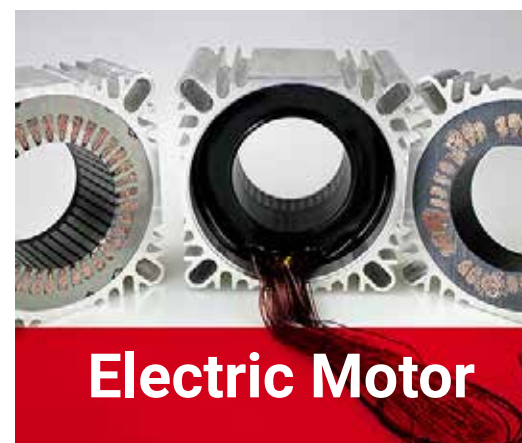
TECHNOLOGY FOCUS: TRANSPARENCY, FLAME PROTECTION, INSULATION



Thermal Conductivity

THERMAL CONDUCTIVITY | TYPICAL APPLICATIONS 2K Systems for an optimised thermal management

Through the use of innovative fillers, we achieve excellent thermal conductivity and at the same time the lowest possible level of abrasiveness, good workability and outstanding flow properties. Those characteristics make our systems optimal for the use in the field of power electronics, battery technology and electric motors.



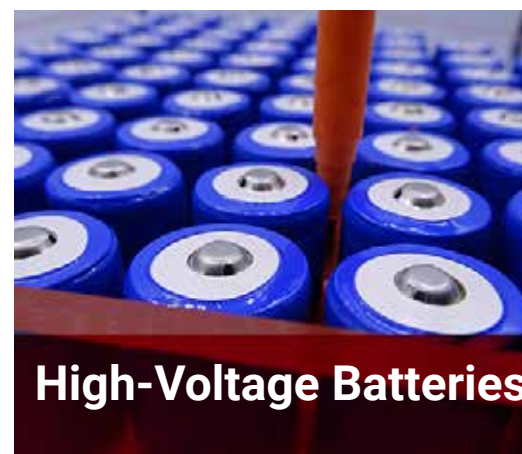
Electric Motor

- + Stator encapsulation
- + Rotor encapsulation
- + End-turn winding encapsulation



Power Electronics

- + Inverter
- + Converter
- + Shifting ring
- + On-Board charging device



High-Voltage Batteries

- + Battery cell encapsulation
- + Battery management system (BMS)



Charging Stations

- + Charging handle
- + Power electronics in charging station
- + Cable and connector

THERMAL PASTE / GAP FILLER | TYPICAL APPLICATIONS 1K and 2K Systems for a technically high heat transfer

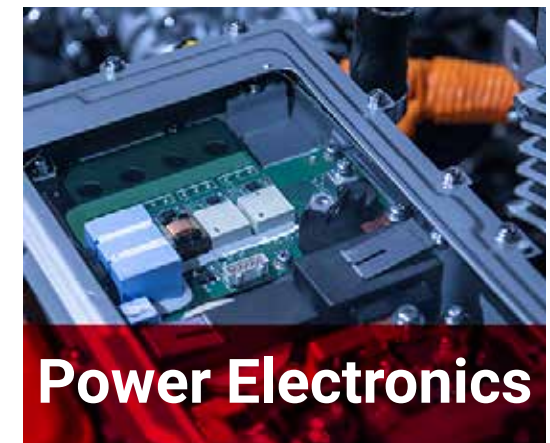
We are your first choice if your application needs an optimal thermal management and properties such as sealing are not required. Our innovative filler matrix also provide the ideal basis for demanding thermal pastes. These are characterised by high thermal conductivity and simultaneous outstanding workability, and are thus serious contributors to optimal thermal management. At the same time, they offer high levels of electrical insulation while not relying to any extent on silicones or solvents.

Thermal Paste / Gap Filler



High-Voltage Batteries

- + Battery cell encapsulation
- + Battery management system (BMS)



Power Electronics

- + White goods (refrigerator)
- + Fans (heating / cooling)
- + Electronic control element
- + Printed circuit boards

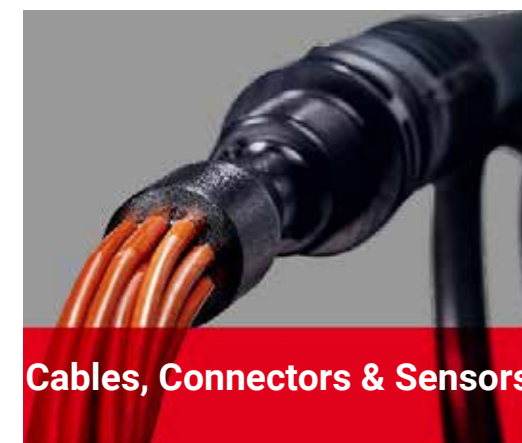
Insulation / (Flame-)protection

INSULATION / (FLAME-)PROTECTION | TYPICAL APPLICATIONS 2K systems for electrical insulation and flame retardancy

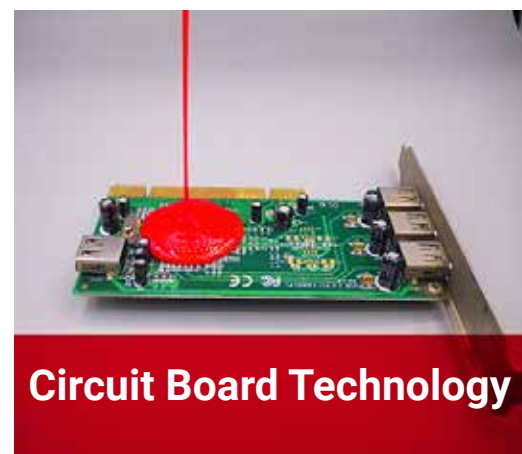
Through the use of various synergetic flame retardants, we achieve optimum flame protection without the use of halogenated flame retardants. In addition, we offer flexible adjustment of the level of hardness, always individually tailored to the customer's demands. The self-extinguishing properties of our products are confirmed by UL certification and open up a wide range of potential uses.



- + Capacitors
- + Transformers
- + RFIDs
- + Induction coils



- + Sensors e.g. pressure sensors
- + Cable bushing
- + Plug connector
- + Cable distributor



- + Control devices (ECU)
- + Measuring devices
- + Measurement technology



- + Splicing sleeves
- + Distributor housings
- + Cable bushing

Transparency

TRANSPARENCY | TYPICAL APPLICATIONS

2K Systems for transparent and translucent applications

To ensure high quality demands we have subjected our systems to ambitious long-term tests and analysed the materials' behaviour over many thousands of hours under extreme weather conditions. With our materials, your components will no longer be sensitive to external influences and be perfectly suited for outdoor use.



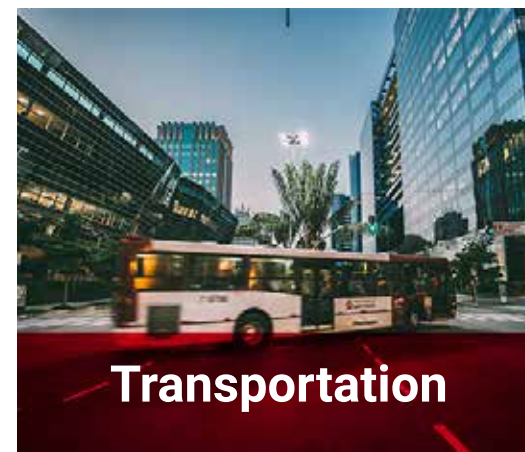
Civil Engineering

- + Exterior lighting of buildings



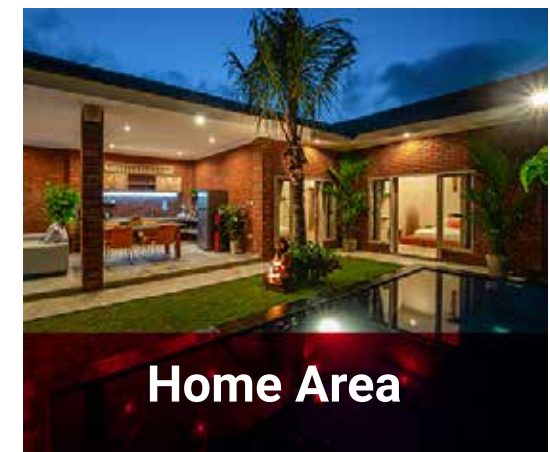
Electronics

- + LED arrays
- + LED strips
- + LED spotlights



Transportation

- + LED lamps
- + LED spotlights



Home Area

- + LED spotlights
- + Pool lighting

Product family	Product number	Product Technology	Description	Colour	Mixing ratio	Viscosity @ 22°C
					W:W	mPas
Insulation / Flame protection	CMR free* 7390	Epoxy	Transparent, low viscosity, high Tg, low CTE, CMR-free*	transparent	100 : 25	450 - 550
	CMR free* 7600 + 7921	Epoxy	High Tg, med/low viscosity, UL 94 V0, CMR-free*	black	100 : 8.9	2.000 - 4.000
	CMR free* 7601 + 7922	Epoxy	Medium Tg, very low low viscosity, UL 94 V0, CMR-free*	natural (beige)	100 : 8.3	670
	CMR free* 7610	Epoxy	transparent, medium viscosity, fast curing, CMR-free*	transparent / yellowish	100 : 96.3	8.000 - 11.000
	CMR free* 7611	Epoxy	black, medium viscosity, fast curing, CMR-free*	black	100 : 96.2	8.000 - 11.000
	8600 + 8901	Polyurethane	low TG, low viscosity, low hardness	brown transparent	100 : 26	300 - 700
	8601 + 8973	Polyurethane	very low TG, temperature range up to +130 °C, rubber elastic, low viscosity	black	100 : 20	1.800 - 2.400
	8605 + 8973	Polyurethane	low viscosity, UL94-V0, low hardness	natural (beige)	100 : 15	900 - 1.300
	8610 + 8901	Polyurethane	high temperature range, medium hardness, UL94 V0	black	100 : 14	3.500 - 4.500
	CMR free* 8610C + 8930	Polyurethane	wide temperature range, medium hardness, UL94-V0, CMR-free*	black	100 : 20	2.500 - 4.500
	8612 + 8901	Polyurethane	allrounder, low viscosity, medium hardness, UL94-V0	natural (beige)	100 : 20	1.200 - 1.800
	CMR free* 8612C + 8930	Polyurethane	low viscosity, medium hardness, UL94-V0, CMR-free*	natural (creme)	100 : 25	1.200 - 1.800
	8615 + 8901	Polyurethane	high TG, low viscosity, excellent chemical resistance, low density	natural (beige)	100 : 50	600 - 800
	8616 + 8973	Polyurethane	high TG, fast curing time, low viscosity, excellent chemical resistance	black	100 : 43	350 - 450
Transparency	CMR free* 8800 + 8930	Polyurethane	high transparency, UV resistant, low hardness, high elongation, CMR-free*	crystal clear	100 : 60	700 - 900
	CMR free* 8804 + 8930	Polyurethane	1:1 mixing ratio, high transparency, low viscosity, UV resistance, CMR-free*	crystal clear	100 : 100	650 - 850
	8808 + 8930	Polyurethane	high transparency, UL94-V0, low viscosity, UV resistant	transparent	100 : 140	200 - 400
	8812 + 8930	Polyurethane	high transparency, high hardness, low viscosity, UV resistant	transparent	100 : 166	850 - 1.250
Thermal conductivity	CMR free* 7500 + 7920	Epoxy	high thermal conductivity of 1,2W/mK, self-levelling, good chemical resistance, cold curing, CMR-free*	black	100 : 8.5	3.000 - 4.000
	8500 + 8973	Polyurethane	thermal conductivity 1,0W/mK, low viscosity, UL94-V0, low hardness	natural (beige)	100 : 12	1.400 - 2.400
	8503 + 8901	Polyurethane	thermal conductivity 1,5W/mK, low viscosity, UL94-V0, medium hardness	natural (beige)	100 : 8	8.500 - 12.500
	CMR free* 8504 + 8930	Polyurethane	thermal conductivity 1.5 W/mK, CMR-free*	natural (cream)	100 : 12	12.000 - 18.000
	8513 + 8973	Polyurethane	thermal conductivity 2,6W/mK, self-levelling, UL94-V0	natural (beige)	100 : 8	15.000 - 20.000
	CMR free* 8514 + 8930	Polyurethane	thermal conductivity 2.6 W/mK, CMR-free*	natural (cream)	100 : 9	60.000 - 70.000
	8519 + 8973	Polyurethane	thermal conductivity 3,5W/mK, self-levelling, UL94-V0	natural (beige)	100 : 7	60.000 - 100.000
	CMR free* 8520 + 8930	Polyurethane	thermal conductivity3.5 W/mK, CMR-free*	natural (cream)	100 : 9	110.000 - 130.000
Thermal pastes + GapFiller	CMR free* 8701	Polyurethane (1K Paste)	thermal conductivity 1,2W/mK, electrically insulating, silicone-free, CMR-free*	natural (cream)	-	100.000 - 150.000
	CMR free* 8702	Polyurethane (1K Paste)	thixotropic, not drying, thermal conductivity 2,0W/mK, silicone-free, CMR-free*	natural (cream)	-	150.000 - 200.000
	CMR free* 8704	Polyurethane (1K Paste)	thermal conductivity 3,5W/mK, high temperature range, silicone-free, CMR-free*	natural (cream)	-	200.000 - 250.000

* not required to be labelled CMR according to section 2 of the MSDS

Pot life	Curing conditions	Density (calculated)	Shore hardness	Operational tempera- ture range	Thermal conductivity	Glass transition temperature	CTE < Tg	CTE > Tg	UL94
min.		g/cm3		°C	W/mK	°C	ppm/K	ppm/K	
45	cold curing	1.13	D85	-40 / +180	0.2	97	50	80	N.A.
66	cold curing	1.62	D90	-40 / +155	0.8	95	49	113	N.A.
316	cold curing	1.55	D65	-40 / +130	0.8	42	49	101	N.A.
3.5	cold curing	1.15	D75	-60 / +100	0.18	52	52	215	N.A.
3.5	cold curing	1.15	D75	-60 / +100	0.2	52	52	215	N.A.
25 - 35	cold curing	1.00 - 1.10	A20 - 30	-60 / +110	0.2	0.2	274.3	244.6	HB
25 - 35	cold curing	0.95 - 1.00	A25 - 35	-80 / +130	0.3	-69.1	101.4	222.4	HB
25 - 35	cold curing	1.40 - 1.50	A65 - 75	-40 / +130	0.5	-29.4	96.9	188.9	V0, 4,0 mm
18 - 25	cold curing	1.50 - 1.60	D45 - 55	-55 / +165	0.6	-2	97.5	167.0	V0, 1,5 mm
15 - 25	cold curing	1.45 - 1.50	D35 - 45	-55 / +165	0.6	-26	78.6	136.3	V0, 1,5 mm
15 - 25	cold curing	1.60 -1.70	D50 - 60	-40 / +130	0.6	12	63.9	155.8	V0, 1,5 mm
15 - 25	cold curing	1.45 - 1.55	D30-40	-40 / +130	0.6	-25	135.4	153.4	V0, 4,0 mm
25 - 35	cold curing	1.20 - 1.25	D80 - 85	-40 / +130	0.3	50	81.9	188.3	HB
7 - 12	cold curing	1.35 - 1.40	D85 - 90	-40 / +130	0.7	56	47.1	143.4	V0, 4,0 mm
30 - 45	cold curing	1.05 - 1.10	A25 - 40	-40 / +130 -40 / +90 **	0.2	-30	101.1	199.8	HB
30 - 45	cold curing	1.05 - 1.10	A58 - 68	-40 / +130 -40 / +90 **	0.2	-2	135.3	199.5	HB
30 - 45	cold curing	1.05 - 1.10	A75 - 85	-40 / +130 -40 / +90 **	0.2	8	124.1	197.5	V0, 4,0 mm
30 - 45	cold curing	1.05 - 1.10	D68 - 72	-40 / +130 -40 / +90 **	0.2	32.2	95.1	188.8	HB
100	cold curing	1.75 - 1.85	D80	-40 / +155	1.2	70	45	100	V0, 2,0 mm
25 - 40	cold curing	1.40 - 1.50	A45 - 55	-40 / +130	1.0	-23	141.5	174.4	V0, 4,0 mm
25 - 35	cold curing	2.20 - 2.30	D50 - 60	-50 / +160	1.5	10	72.5	141.7	V0, 1,5 mm
10 - 30	cold curing	2.30 - 2.40	D40 - 50	-40 / +130	1.5	17	128.6	160.3	HB
20 - 40	cold curing	2.20 - 2.30	D40 - 50	-40 / +130	2.6	-23	91.4	129.1	V0, 4,0 mm
20 - 40	cold curing	2.20 - 2.30	D40 - 50	-40 / +130	2.6	-23	137.9	162.0	HB
17 - 25	cold curing	2.10 - 2.20	D20 - 30	-40 / +130	3.5	-8	131.5	157.4	V0, 4,0 mm
15 - 25 at 40°C	cold curing	2.05 - 2.15	D35 - 45	-40 / +130	3.5	-23	156.2	187.9	HB
-	-	2.25 - 2.55	-	-60 / +140	1.2	-	-	-	-
-	-	2.20 - 2.50	-	-60 / +200	2.0	-	-	-	-
-	-	2.10 - 2.30	-	-60 / +200	3.6	-	-	-	-

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ENCAPSULATION**

Kisling

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