WACKER

CREATING TOMORROW'S SOLUTIONS

ELASTOSIL®

POWERSIL®

SEMICOSIL®

WACKER SilGel®

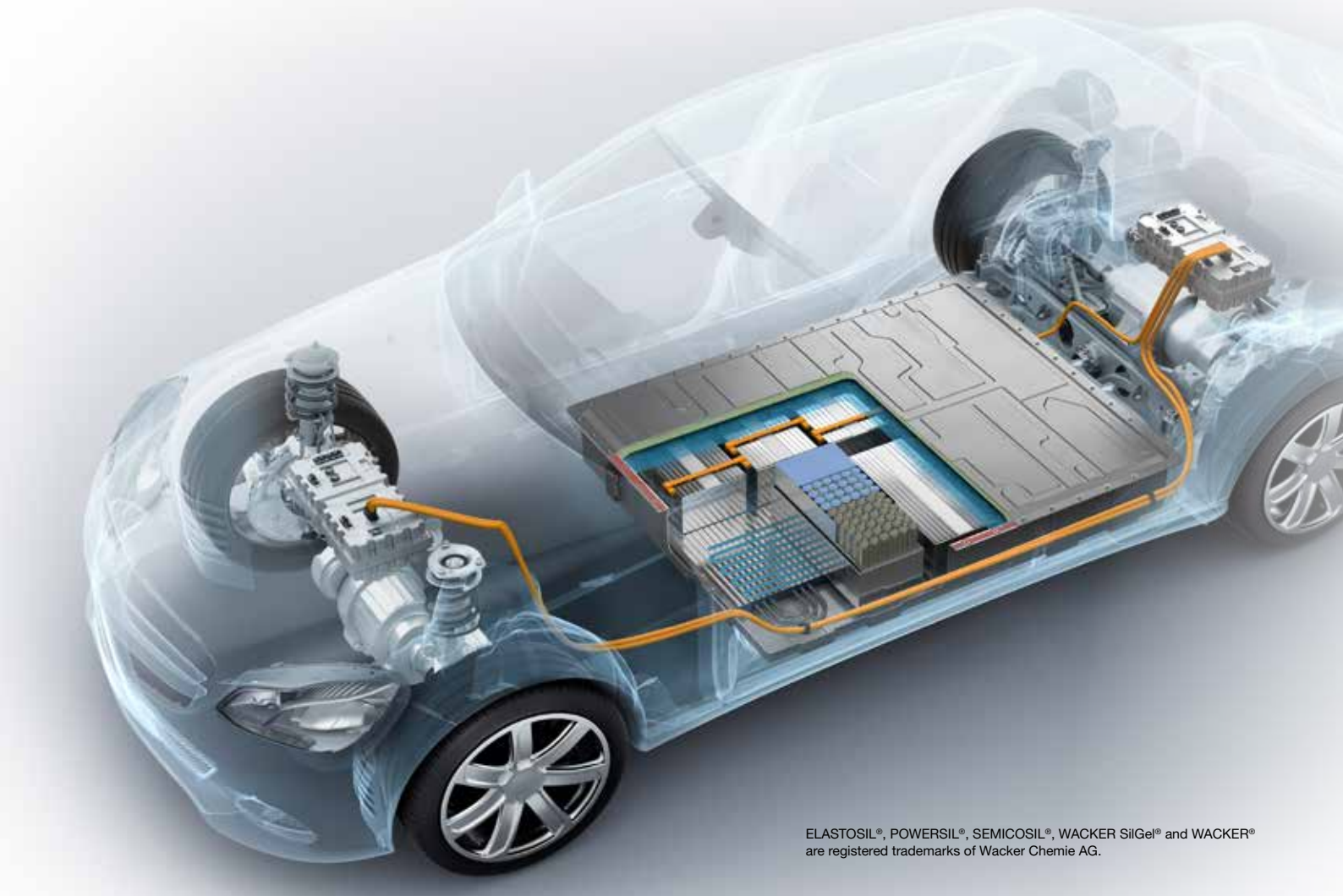
MOBILITY

e-NOVATION FOR BATTERIES
POWERED BY SILICONES

AT THE HEART OF E-MOBILITY:
SILICONE SOLUTIONS FROM WACKER

There is no e-mobility without batteries. With our long experience in the automotive, semiconductor and power electronics industry, we have developed a range of solutions to improve the functionality, performance and safety of batteries in e-mobility.

And we don't stop there: as one of the most research-intensive chemical corporations worldwide, we are constantly working on innovative materials and solutions. Talk to us about your ideas and projects! Together we can power up the future.



TACKLING THE CHALLENGES OF BATTERY ASSEMBLY AND SAFETY

As EV adoption grows, manufacturers are facing huge challenges in improving battery performance and safety. We support the electrification of vehicle drive trains with leading silicone-based product solutions.

Challenge 1:

Assembly and Series Production

Next-generation EV batteries must be compatible with large-volume, cost-effective series-production and assembly processes.

Challenge 2:

Thermal Heat Management

Innovative ways must be found to manage the greater heat generated by these lightweight and new battery designs, with their higher energy densities. The key to success is to keep the automotive battery cells at their optimum temperature, and so ensure optimal performance and power.

Challenge 3:

Battery Safety in Catastrophic Events

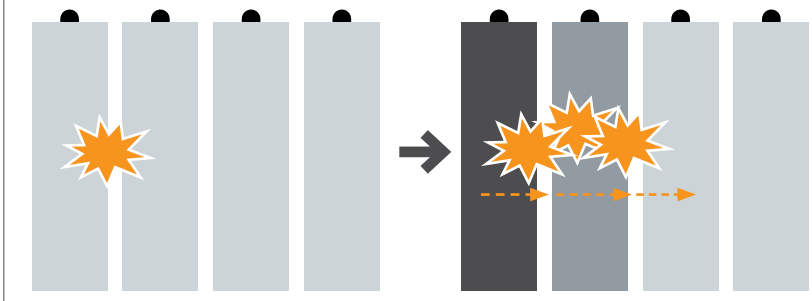
Ensuring battery safety even in catastrophic events, such as fire outbreak. Thermal stability is lost when an affected cell generates heat faster than it can be dissipated; this results in cell venting, fire, and thermal runaway, and in some instances ejection of the cell contents.

One Solution:

Silicones Help Solve the Major Challenges

They are ideal for use in cost-effective series-production and assembly processes. They are perfect for thermal management as they can efficiently dissipate heat – even from complicated shapes. And they maintain their properties over long periods of time and a broad range of temperatures. (-50 °C to +180 °C, special grades up to +230 °C).

Cascading Failures in a Battery Pack



The important safety criterion for batteries is to keep the temperature within the desired working range and preventing cascading failures from one cell to another in a battery pack. A cascading failure is typically accompanied by a sustained fire which further accelerates the battery failure. WACKER offers various silicone solutions aimed at keeping battery temperatures within the optimum range, increasing battery safety in general and, in particular, preventing fire propagation.

Even under extreme operating conditions where other organic materials often degrade, our silicones efficiently keep your batteries safe.

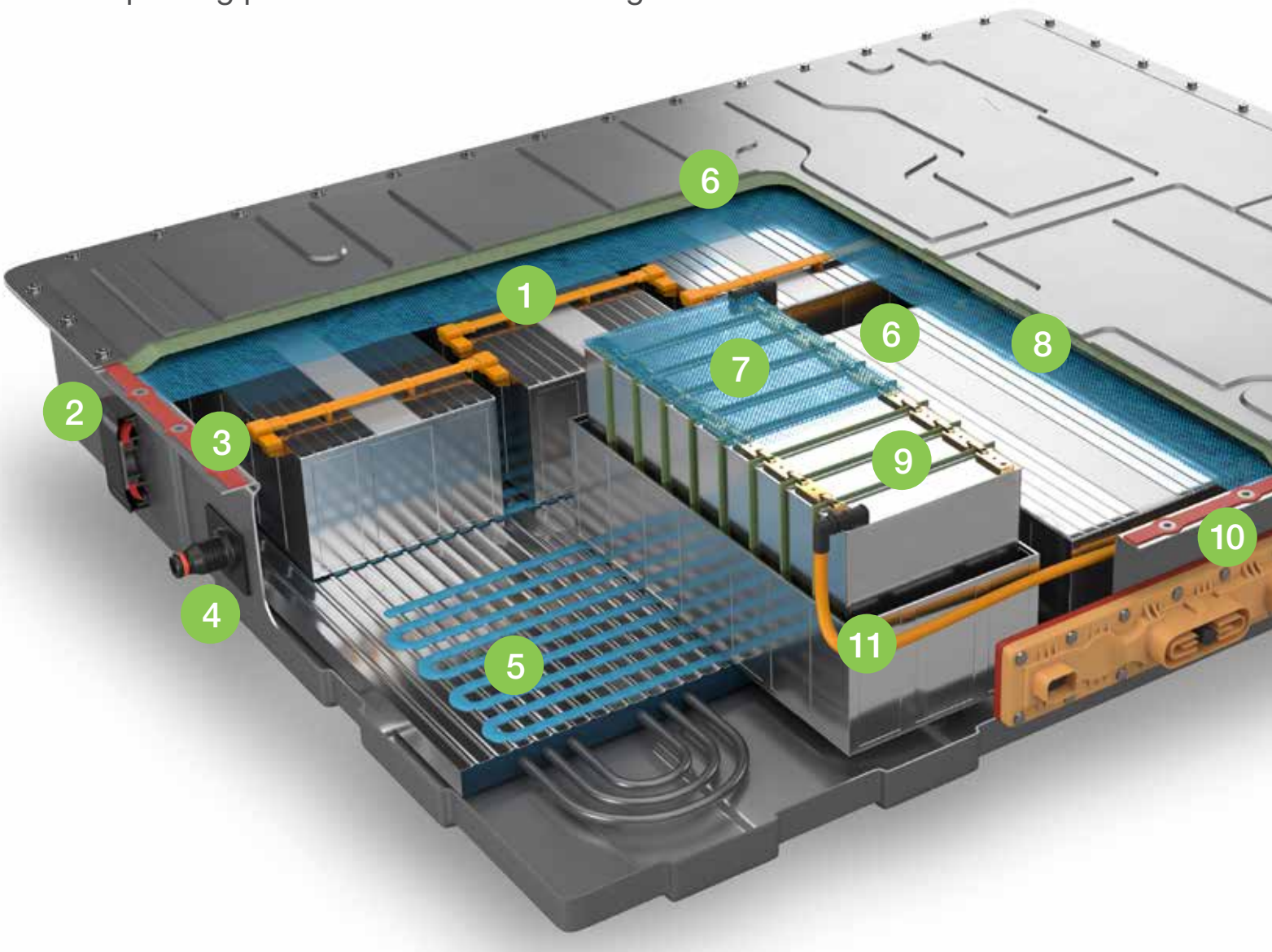
Silicones: the Right Choice for Batteries

Silicones are the products of choice where high-temperature resistance and permanent flexibility are top priorities. Other advantages comprise:

- Reliability (resistance to thermal shock, oxidation, moisture, and chemicals)
- Excellent electrical insulation (dielectric strength)
- Very low thermal resistance
- Excellent stress relief
- Thermal event isolation: silicones slow the spread of thermal events

BECAUSE BETTER BATTERIES WILL ACCELERATE CAR ELECTRIFICATION

Performance and safety of a battery pack are influenced by the battery pack design, pack topology, cell form factor, and various other factors. But silicones can also make a major contribution to improving performance and extending service life.



1 **Busbar**
Coating with thermally conductive silicone rubber

2 **Pressure control and battery emergency vent valve**
Made with liquid silicone rubber

3 **Battery gasket**
- Dispensable silicone lid sealing, CIPG
- Flame-retardant solid silicone rubber

4 **Battery coolant connectors**
Made with liquid silicone rubber

5 **Thermal management**
Thermally conductive gap filler or adhesive

6 **Battery lid / module protection**
Sprayable/dispensable silicone coating/potting

7 **Cell module protection**
Thermal and electric insulation coating or sheet

8 **Cover protection sheet for thermal runaway**
- Based on solid silicone rubber
- Fiber composite based on silicone resin as matrix system

9 **Module assembly**
- (Thermally conductive) adhesive
- Insulation sheet

10 **Connector seals**
Made with liquid silicone rubber

11 **High voltage cable**
Made with solid silicone rubber

Our Portfolio for You

Silicones for Battery Modules and Pack Systems

- **Thermally conductive (TC) grades for thermal management**
  - TC gap fillers for efficient heat transfer
  - TC adhesives if defined adhesion is needed
  - TC pastes if no curing is needed

- **Automotive bonding and sealing grades**
  - Couple cells with heat sink elements (bonding)
  - Couple cells for vibration control (bonding)
  - Couple modules to active cooling
  - Seal modules (CIPG – cured-in-place gasket)
  - Battery lid sealing with ceramifying sealants
  - Solid silicone rubber grades
  - High-voltage cable insulation and connector sealing
  - Battery gaskets with flame-retardant silicone rubber
  - Silicone coating
    - Battery lid and module protection via sprayable or dispensable coatings

- **Liquid silicone rubber**
  - Connector seals
  - Battery coolant connectors
  - Pressure control and battery emergency vent valves

- **Cover protection sheets**
  - Based on solid silicone rubber
  - Based on silicone resin (fiber) composites

Silicones for Battery Management System

- **(Thermally conductive) potting and encapsulation grades to protect electronic components**

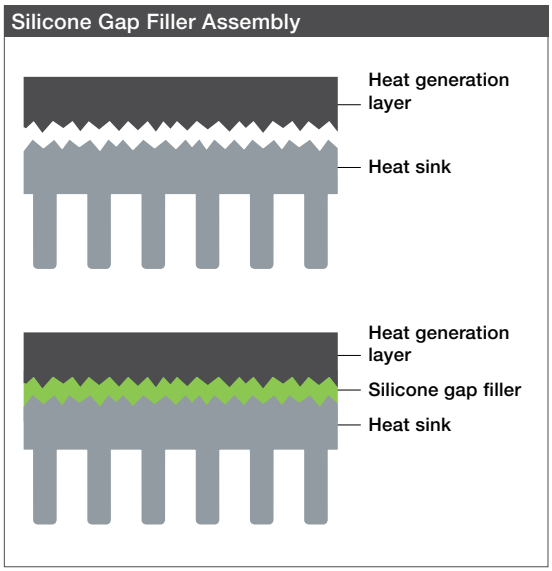
SEMICOSIL® GAP FILLER – DISSIPATE HEAT

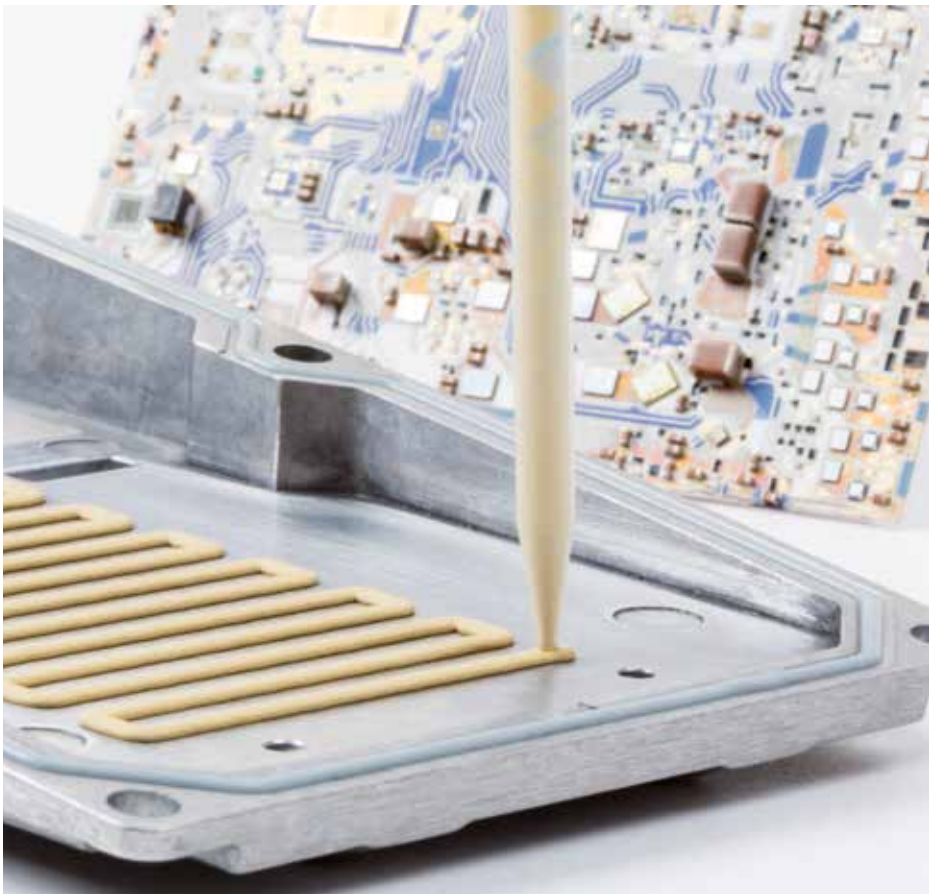
Whether during charging or use, batteries generate and release levels of heat that need to be kept within an optimal range to ensure safety and help extend their lifetime. Soft, flexible, thermally conductive silicones dissipate this heat. With its highly innovative SEMICOSIL® 96x TC series, WACKER has developed a range of thermally conductive gap fillers that are not only cost-effective and easy to process, but also offer safe functionality and high durability.

For use in batteries in both EVs and HEVs, SEMICOSIL® 96x TC series are two-component silicone gap fillers with thermal conductivities in the range from 2 W/mK to 4 W/mK, which are applied directly to the heat sink. Once pressed into place, the gap filler cures to form a soft, cushioning silicone layer that dissipates the heat. While curing to form a reliable bond can occur at room temperature, it is faster at higher temperatures.

Benefits of the SEMICOSIL® 96x TC Series

- Low-density gap filler available
- Remains soft and tacky between -50 °C and +180 °C
- High dispensing speed and fast cure for reduced cycle times
- Low modulus allows assembly of very fragile devices
- Excellent conformability to complex surfaces and geometries
- One solution for different applications (no coordination and storage of different pad or die-cut shape sizes)
- Low volatiles, D4-D8 < 350 ppm
- UL 94 V-0 rating (WACKER in-house testing)
- Processing approved by leading equipment manufacturers
- Dielectric insulation
- Available in 200 L drums and pails





POTTING WITH ELASTOSIL®
ENHANCE BATTERY SAFETY

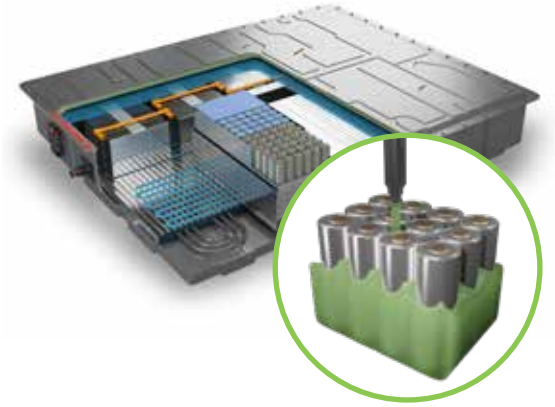
What should not happen, sometimes does happen: a thermal runaway occurs in a single battery cell. Potting with silicones helps to prevent thermal propagation.

Isolate Round Cells by Cell Potting

ELASTOSIL® CM 181 is formulated with a light filler and also absorbs heat:

- Ideal for potting gaps between round battery cells
- Low viscosity, low density
- Room-temperature curing
- Variable A/B ratio
- Moderately compressible
- Mechanical support
- Isolating and heat-absorbing filler concept
- Dielectric strength (>3.5 kV/mm)

The potting isolates the cells electrically and thermally. At the same time, it provides mechanical support and has a protective function. As a result, vibrations, shocks, and thermal expansion of the cells can be absorbed and counterbalanced. Potting the gaps between the cells with ELASTOSIL® CM 181 thus makes the battery cells safer to operate.



Side potting with ELASTOSIL® CM 181 isolates cells thermally and electrically.

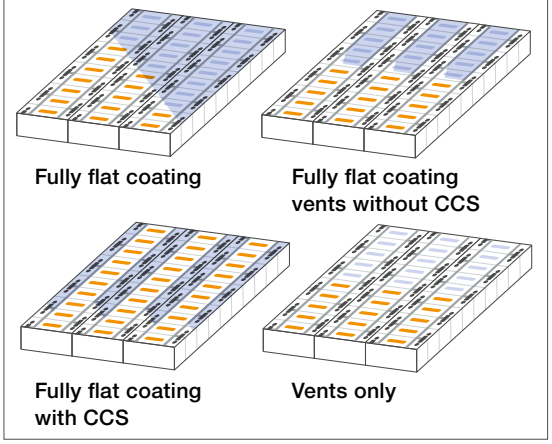
Protect Neighboring Cells by Top Potting

ELASTOSIL® CM 185 was developed for use as a potting compound for the venting channels and cell contact system (CCS) of lithium-ion batteries:

- Pourable, application by dispensing
- Self-leveling, self-priming
- Room-temperature curing
- Thermally and electrically insulating

The elastomer has optimized mechanical properties for the application. In the event of a thermal runaway, a single cell can release pressure by bursting its top potting without critical underblowing of the protective potting of the neighboring cells. ELASTOSIL® CM 185 is applied in a thin layer to the sensitive venting channels and cell contact system (CCS) of a battery pack. The neighboring cells are thus protected against the jet of hot gases and potentially electrically conductive particles that are ejected from the affected cell. Thermal propagation is blocked, as the neighboring cell contact system remains unharmed, and pressure is released via the pre-defined venting channels.

Top Potting with ELASTOSIL® CM 185



Potting with ELASTOSIL® CM 185 effectively prevents thermal propagation (also suitable for round cells).

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

Battery: Thermal Management Thermally Conductive Silicone Encapsulants

Tough encapsulation materials with good resistance to mechanical and environmental stress

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated	Product Type	Viscosity D = 10 1/s [mPa·s]	Hardness	Tensile Strength [MPa]	Elongation at Break [%]	Density [g/cm³]	Lap Shear Strength [N/mm²]	Curing
ELASTOSIL® RT 607	General-purpose potting	0.5	Addition	Heat	2-part, 9:1	10,000 (D = 0.5 1/s)	55 Shore A	3.5	100	1.4	-	20 min/70 °C
ELASTOSIL® RT 743 LV-K	General-purpose potting, low viscosity	0.5	Addition	Heat	2-part, 1:1	1,100 (D = 0.5 1/s)	20 Shore A	3	150	1.5	-	60 min/120 °C
ELASTOSIL® RT 7331 TC (KR)	Low viscous, self-leveling, self-adhesive	3.0	Addition	Heat	2-part, 1:1	13,000	45 Shore 00	-	-	-	-	60 min/120 °C
ELASTOSIL® RT 739 TC (KR)	Self-leveling, good flow and adhesion properties	2.2	Addition	Heat	2-part, 1:1	9,000/5,000	40 Shore A	1.3	60	2.8	0.6	60 min/120 °C
ELASTOSIL® RT 7612 AD TC CN	Room-temperature curing, self adhesive	1.4	Addition	Heat	2-part, 1:1	3,000/2,000	60 Shore 00	N.d.	N.d.	2.4	N.d.	120 min/25 °C
ELASTOSIL® RT 7620 TC CN	High flowable, low modulus encapsulant	2.0	Addition	Heat	2-part, 1:1	5,500/9,000	50 Shore 00	N.d.	N.d.	2.6	N.d.	30 min/80 °C
ELASTOSIL® RT 7640 TC CN*	Next-generation high conductive encapsulant	4.0	Addition	Heat	2-part, 1:1	14,000/12,000	55 Shore 00	N.d.	N.d.	2.8	N.d.	30 min/80 °C

Battery: Thermal Management Thermally Conductive Dispensable Silicone Gap Fillers & Pastes

Soft, flexible gap filling between uneven surfaces across broad temperature range; non-curing, low-stress paste solutions

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated	Product Type	Viscosity D = 10 1/s [mPa·s]	Hardness	Tensile Strength [MPa]	Elongation at Break [%]	Density [g/cm³]	Lap Shear Strength [N/mm²]	Curing
WACKER® Silicone Paste P12	Standard thermal heat sink paste	0.8	Non-curing	-	1-part, ready-to-use	Non-slump	Paste-like	N.a.	N.a.	2.1	-	-
SEMICOSIL® Paste 40 TC	High performance paste	4.0	Non-curing	-	1-part, ready-to-use	Non-slump	Paste-like	N.a.	N.a.	3.27	-	-
SEMICOSIL® 937 TC (KR)	High TC gap filler for ADAS applications	7.4	Addition	Heat	2-part, 1:1	180,000	65 Shore 00	-	-	-	-	12 h/23 °C
SEMICOSIL® 961 TC	High dosing-rate, UL 94 V-0, low volatiles	2.3	Addition	RT or fast cure at elevated temp.	2-part, 1:1	130,000	25 Shore A	N.d.	N.d.	2.9	-	4 – 6 h/23 °C
SEMICOSIL® 962 TC	High dosing-rate, soft tacky gel, UL 94 V-0, low volatiles	3.0	Addition	RT or fast cure at elevated temp.	2-part, 1:1	150,000	50 Shore A	N.d.	N.d.	3.1	-	4 – 6 h/23 °C
SEMICOSIL® 966x TC series	Next-generation, injectable gap filler	3.0	Addition	Heat	2-part, 1:1	<200,000	50 Shore 00	-	-	-	-	>24 h/23 °C
SEMICOSIL® 9671 TC4	Next-generation, low-density, shear thinning	2.3	Addition	Heat	2-part, 1:1	200,000	60 – 70 Shore 00	-	-	-	-	12 h/23 °C
SEMICOSIL® 9673 TC	Next-generation, low-density, shear thinning	3.6	Addition	Heat	2-part, 1:1	600,000	65 Shore 00	-	-	-	-	12 h/23 °C

Battery: Thermal Management Thermally Conductive Silicone Adhesive

Silicone adhesive to couple cells with heat sink element/coupling of modules to active cooling; also for application in PTC heaters

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated	Product Type	Viscosity D = 10 1/s [mPa·s]	Hardness	Tensile Strength [MPa]	Elongation at Break [%]	Density [g/cm³]	Lap Shear Strength [N/mm²]	Curing
SEMICOSIL® 971 TC*	Only in cartridges, re-homogenization necessary	2.0	Addition	Heat	1-part	100,000	80 Shore A	5	70	2.8	-	60 min/130 °C

* Under development

** Base component to be combined with ELASTOSIL® CAT PT or ELASTOSIL® CAT PT-F to allow curing at room temperature or under heat (for details, please refer to the respective technical datasheet)

N.d.: No data, N.a.: Not applicable

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

Battery Assembly **Adhesives / Foam**

Couple cells for vibration control, module sealing, battery housing sealing (compressible / non-compressible), electric insulation of cells

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated by	Product Type	Viscosity D = 0.5 1/s [mPa·s]	Hardness	Tensile Strength [MPa]	Elongation at Break [%]	Density [g/cm³]	Curing*
ELASTOSIL® E4	CIPG, FIPG	0.2	Acetoxy	RT	1-part, RTV-1	Non-slump	15 Shore A	1.7	900	1.02	120 h / 23 °C
SEMICOSIL® 811	Low-energy cure adhesive, low-temperature cure, oven-free, fast adhesion build-up at moderate temperature, FIPG	0.2	Addition	Room temperature, heat or UV	2-part 10:1	Non-slump	30 Shore A	3.3	330	1.08	BKS**, see extra table
SEMICOSIL® 986 / 1K	Sealing adhesive, FIPG, thixotropic, specified ion content, UV tracer	0.2	Addition	Heat	1-part	Non-slump	50 Shore A	5	200	1.1	30 min / 130 °C; 10 min / 150 °C
SEMICOSIL® 987 GR	Sealing adhesive, CIPG, FIPG	0.2	Addition	Heat	1-part	Non-slump	55 Shore A	5	200	1.1	60 min / 130 °C; 10 min / 150 °C
SEMICOSIL® 988 / 1K gray / tran	Sealing adhesive, CIPG, FIPG	0.2	Addition	Heat	1-part	Non-slump	35 Shore A	4.5	350	1.1	60 min / 130 °C; 10 min / 150 °C
SEMICOSIL® 9882	Fast curing, designed for large part CIPG and for ovenless IR curing	0.2	Addition	Heat or IR light	2-part, 1:1	Non-slump	30 Shore A	7	500	1.1	CIPG IR / heat cure 60 – 130 °C: > 30 min / 60 °C; > 10 min / 100 °C
SEMICOSIL® 989/1K	Sealing adhesive, FIPG	0.2	Addition	Heat	1-part	Non-slump	55 Shore A	5	200	1.1	60 min/130 °C; 10 min/150 °C
ELASTOSIL® N9111	Multipurpose sealant & adhesive, CIPG	0.2	Alcoxy	Moisture, RT	1-part	Non-slump	30 Shore A	2.2	500	1.3	Skin forming 20 – 45 min
ELASTOSIL® RT 705 (F)	Self-leveling adhesive	0.2	Addition	Heat	2-part, 1:1	Non-slump	42 Shore A	3	180	1.24	10 min/140 °C; 2 min/200 °C
ELASTOSIL® RT 722	Low-energy cure adhesive, low volatile, excellent mech. properties	0.2	Addition	Heat	2-part, 1:1	Non-slump	45 Shore A	6	300	1.1	45 min / 90 °C; 15 min / 125 °C
ELASTOSIL® RT 725 LV	Low-energy cure adhesive, low volatile, UV tracer	0.2	Addition	Heat	2-part, 1:1	Non-slump	50 Shore A	7	250	1.1	10 min / 100 °C; 30 min /60 °C

Battery Assembly **Cell Pack/Battery Management System Potting**

WACKER Silgel® 612	Very soft, clear, low bleed, general purpose, UL 94 HB	0.2	Addition	RT or heat	2-part, 1:1	1,000	300 1/10 mm	-	-	0.97	8h/25 °C, 15 min/100 °C
WACKER Silgel® 612 EH	Higher hardness & reactivity grade of Silgel® 612	0.2	Addition	RT or heat	2-part, 1:1	1,000	150 1/10 mm	-	-	0.97	2h/23 °C, 10 min/70 °C

* Speed of adhesion build-up depends on substrate

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

Battery Connectors **Encapsulants**

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated by	Product Type	Viscosity D = 0.5 1/s [mPa·s]	Hardness	Tensile Strength [MPa]	Elongation at Break [%]	Density [g/cm³]	Curing
SEMICOSIL® 949 UV A SEMICOSIL® 949 UV B	Very low viscosity, UV tracer, primerless bonding	0.2	Addition	Room temperature, heat or UV	2-part, 10:1, BKS** with 949 UV B	200	35 Shore 00	-	-	0.97	See extra table
SEMICOSIL® 949 UV A SEMICOSIL® 950 UV B	Low hardness, transparent, UV tracer, shadow curing, primerless bonding	0.2	Addition	UV	2-part, 10:1, BKS** with 950 UV B	200	35 Shore 00	-	-	0.97	See extra table
ELASTOSIL® RT 743 LV-K	General-purpose potting, low viscosity	0.5	Addition	Heat	2-part, 1:1	1,100	20 Shore A	3	150	1.5	60 min/120 °C

Battery Connectors **Adhesives**

Sealing of battery connectors

SEMICOSIL® 988/1K gray/tran	Non-slump thixotropic	0.2	Addition	Heat	1-part	Non-slump thixotropic	35 Shore A	4.5	350	1.1	60 min/130 °C; 10 min/150 °C
SEMICOSIL® 989/1K	Sealing adhesive, FIPG	0.2	Addition	Heat	1-part	Non-slump	55 Shore A	5	200	1.1	60 min/130 °C; 10 min/ 150 °C

** BKS = Batch-Kit System: base component to be combined with ELASTOSIL® CAT PT, ELASTOSIL® CAT PT-F or ELASTOSIL® CAT UV to allow curing at room temperature, under heat or by UV light (for details, please refer to the respective technical datasheet)

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

High Voltage Cables

Long-term heat resistant high consistency rubber (HCR) for high voltage cables offers safety benefits in electric cars

Product	Features	Hardness Shore A ISO 48-4	Specific Gravity [g/cm³] ISO 1183-1A	Tensile Strength [N/mm²] ISO 37 Typ 1	Elongation at Break [%] ISO 37 Typ 1	Tear Resistance [N/mm] ASTM D 624 B	Compression Set [%] (22 h/175 °C) DIN ISO 815-1	Flame Retardancy – UL 94 Listing	Appeareance
ELASTOSIL® R *plus* 4305/60	High tear resistance, platinum cure	60	1.15	9.8	660	37	12	HB (0.5 mm)**	Transparent
ELASTOSIL® R *plus* 4305/70	High tear resistance, platinum cure	70	1.18	9.1	600	39	14	HB (0.5 mm)**	Transparent

Pressure Control and Battery Emergency Vent Valve

The unique properties of silicone elastomers enable reliable pressure management solutions and battery safety

ELASTOSIL® LR 3003/40	Multi purpose	40	1.13	10	610	30	11	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3003/50	Multi purpose	50	1.13	10.3	490	26	13	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3003/60	Multi purpose	60	1.13	9.8	340	27	16	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3011/50 FR	Flame retardant, low inflammability, short curing times	50	1.13	10	510	28	13	V-0 (0.7 and 3 mm)	Dark gray / black
ELASTOSIL® LR 3170/40	Flame retardant, self-adhesive	45	1.12	9.2	590	23	34*	V-0 (3 mm); HB (0.5; 0.8 mm)	Dark gray / black

Battery Coolant Connectors

Dedicated coolant resistant silicone elastomers are the solution for battery thermal management

ELASTOSIL® LR 3005/60	Low compression set, fast cure	60	1.13	9.5	380	28	15	HB (1.5 mm)**	Transparent
ELASTOSIL® LR 3023/60	Coolant resistant, low comp. set, npc	60	1.12	5.9	300	15	11	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3074/60	Coolant resistant, self-adhesive	60	1.13	6.8	360	14	19	HB (0.5 mm)**	Opaque

* Compression set [%] (22 h/125 °C) DIN ISO 815-1

** Determined in internal flame retardancy test, not listed at UL

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

Connector Seals

Silicone elastomers offer a very reliable sealing performance and guaranteee a long operating lifetime

Product	Features	Hardness Shore A ISO 48-4	Specific Gravity [g/cm³] ISO 1183-1A	Tensile Strength [N/mm²] ISO 37 Typ 1	Elongation at Break [%] ISO 37 Typ 1	Tear Resistance [N/mm] ASTM D 624 B	Compression Set [%] (22 h/175 °C) DIN ISO 815-1	Flame Retardancy – UL 94 Listing	Appeareance
ELASTOSIL® LR 3003/30	Multi purpose	30	1.09	7	610	21	10	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3003/40	Multi purpose	40	1.13	10	610	30	11	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3003/50	Multi purpose	50	1.13	10.3	490	26	13	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3003/60	Multi purpose	60	1.13	9.8	340	27	16	HB (0.5 mm)	Transparent
ELASTOSIL® LR 3005/30	Low comp. set, npc, fast cure	30	1.1	6	610	16	13	HB (1.5 mm)	Transparent
ELASTOSIL® LR 3005/40	Low comp. set, npc, fast cure	40	1.13	7.8	600	22	16	HB (1.5 mm)	Transparent
ELASTOSIL® LR 3005/50	Low comp. set, npc, fast cure	50	1.12	8.7	500	24	15	HB (1.5 mm)	Transparent
ELASTOSIL® LR 3005/60	Low comp. set, npc, fast cure	60	1.13	9.5	380	28	15	HB (1.5 mm)	Transparent
ELASTOSIL® LR 3065/30	Low coefficient of friction, low comp. set, npc	30	1.12	7.5	650	24	17	HB (0.5; 1.5; 3 mm)	Transparent
ELASTOSIL® LR 3065/50	Low coefficient of friction, low comp. set, npc	50	1.12	9	460	31	15	HB (0.5; 1.5; 3 mm)	Transparent
ELASTOSIL® LR 3675/30	Self-adhesive, low coefficient of friction	30	1.12	8	760	25	54	HB (0.5 mm)**	Transparent
ELASTOSIL® LR 3675/50	Self-adhesive, low coefficient of friction	50	1.12	7.8	410	33	27*	HB (0.5 mm)**	Transparent
ELASTOSIL® LR 3072/30	Self-adhesive, oil-bleeding	30	1.11	7.4	710	17	21*	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3072/40	Self-adhesive, oil-bleeding	40	1.12	8.8	620	21	12*	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3072/50	Self-adhesive, oil-bleeding	50	1.12	8.6	510	23	31	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3841/50	Oil-bleeding, low comp. set, npc	50	1.13	9	490	30	13	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3842/40	Oil-bleeding, low comp. set, npc	40	1.12	8	610	25	13	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3842/50	Oil-bleeding, low comp. set, npc	50	1.13	8.5	460	37	12	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3842/60	Oil-bleeding, low comp. set, npc	60	1.14	9.2	420	38	13	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3842/70	Oil-bleeding, low comp. set, npc	68	1.14	8.5	380	28	16	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3843/30	Oil-bleeding, low comp. set, npc	30	1.12	8	680	22	16	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3844/30	Oil-bleeding, low comp. set, npc	30	1.1	7.2	700	22	17	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3844/40	Oil-bleeding, low comp. set, npc	42	1.13	8.5	580	24	15	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3844/50	Oil-bleeding, low comp. set, npc	50	1.13	8.5	500	36	14	HB (0.5 mm)**	Opaque
ELASTOSIL® LR 3846/30	Oil-bleeding, low comp. set, npc	30	1.11	7	750	19	15	HB (0.5 mm)**	Opaque

* Compression set [%] (22 h/125 °C) DIN ISO 815-1

** Determined in internal flame retardancy test, not listed at UL

PRODUCT OVERVIEW
SILICONES FOR xEV BATTERIES

Battery Management System/PCB Protection Conformal Coatings

Solvent-free, 100% silicone, UV initiated products available, fast reaction, shadow cure, no volatile by-products (addition-cure)

Product	Features	Thermal Conductivity [W/mK]	Curing Type	Curing Initiated by	Product Type
SEMICOSIL® 942 UV A/B	Soft gel, sprayable, UV tracer	0.2	Addition	UV	2-part, 10:1

Product	Viscosity D = 0.5 1/s [mPa·s]	Hardness	Density [g/cm³]	Curing
SEMICOSIL® 942 UV A/B	2,500	Pen 60 mm/10	0.98	15 min/70 °C no UV act., 20 s/UV act. for 20 sec.

Potlife and Cure Times for BKS* Grades (10:1 Mix)

Product	Potlife [min] 10:1 with ELASTOSIL® CAT			Curing Time [min] 10:1 with ELASTOSIL® CAT		
	CAT PT [min] 25 °C	CAT PT-F [min] 25 °C	CAT UV [h] 25 °C	CAT PT [min] 100 °C	CAT PT-F [min] 100 °C	CAT UV** [min] 100 °C
SEMICOSIL® 811	45	30	> 48	–	–	< 10***
SEMICOSIL® 949	20	< 15	> 24	15	10	< 2****

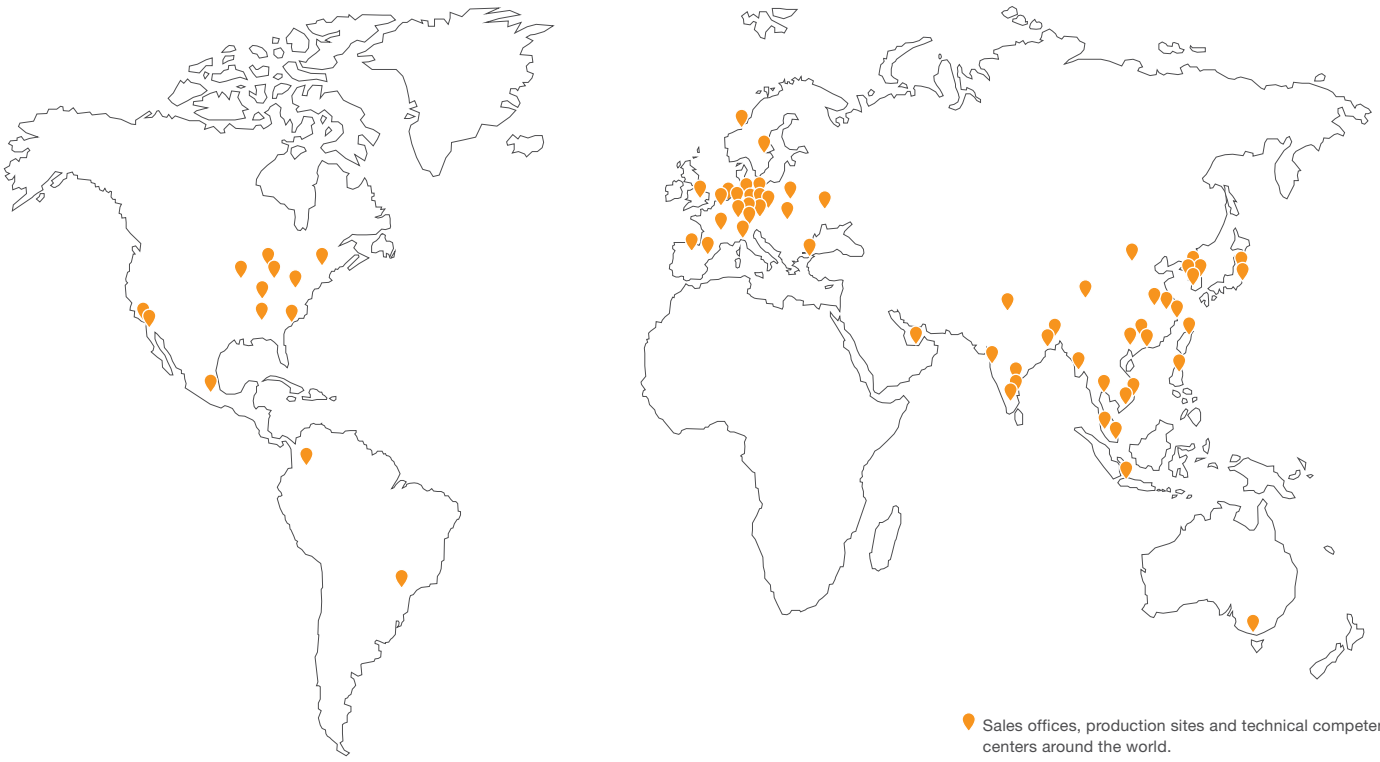
* BKS = Batch-Kit System: base component to be combined with ELASTOSIL® CAT PT, ELASTOSIL® CAT PT-F or ELASTOSIL® CAT UV to allow curing at room temperature, under heat or by UV light (for details, please refer to the respective technical datasheet)

** Curing time under UV irradiation depending on substrate, layer thickness, UV intensity and dose. Ozone-free Fe-discharge lamp (emission > 250 nm) is recommended

*** Typically 40-60 sec open time (time to bond), cure at 25 °C after 30 min. Adhesion: 25 °C (PBT/Al): > 45 min; Adhesion: 80 °C (PBT /Al): < 5 min

**** As encapsulant an intensity between 100 and 400 mW/cm² can be chosen. At high intensity, material is cured almost immediately after irradiation (10 sec)

EXPERTISE AND SERVICE NETWORK ON FIVE CONTINENTS



Sales offices, production sites and technical competence centers around the world.

WACKER is one of the world's leading and most research-intensive chemical companies, with total sales of €6.4bn. Products range from silicones, binders and polymer additives for diverse industrial sectors to bioengineered pharmaceutical actives and hyperpure silicon for semiconductor and solar applications. As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer a high value-added potential to ensure that current and future generations enjoy a better quality of life, based on energy efficiency and protection of the climate and environment.

Spanning the globe with 4 business divisions, we offer our customers highly-specialized products and comprehensive service via 27 production sites, 22 technical competence centers, 14 WACKER ACADEMY training centers and 48 sales offices in Europe, North and South America, and Asia – including a presence in China. With a workforce of some 16,400, we see ourselves as a reliable innovation partner that develops trailblazing solutions for, and in collaboration with, our customers. We also help them boost their own success. Our technical competence centers employ local specialists, who assist customers worldwide in the development of products tailored to regional demands, supporting them during every stage of their complex production processes, if required.

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All figures are based on fiscal 2023.

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