Makrolon® Makroblend® Bayblend® Apec®

Design and material solutions for electric vehicle supply equipment

covestro

Covestro and the EV charging industry

Engineering plastics enable customers to create individual designs for electric vehicle (EV) charging stations while meeting global market requirements. Our strong, lightweight package of weatherproof materials meets electrical insulation standards, making it ideal for both robust outdoor EV charging solutions and stylish wall box designs. As a true high-tech material, polycarbonate is not only robust, breakproof, and lightweight, but it also offers a high degree of design freedom. These properties are advantageous for the EV charging industry.

Covestro is partnering with innovation leaders along the EV value chain to make electric car charger materials reliable, affordable, and more sustainable. Our Makrolon® polycarbonate resins and Bayblend® polycarbonate blends can be used in charger housings, front covers, display lenses, light guides, and connectors for both indoor and outdoor charging stations. Elastomers, polyurethanes, and thermoplastic polyurethanes such as Texin® and Desmopan® can be used for decorative parts and in charging connectors and their associated holders and power cables.

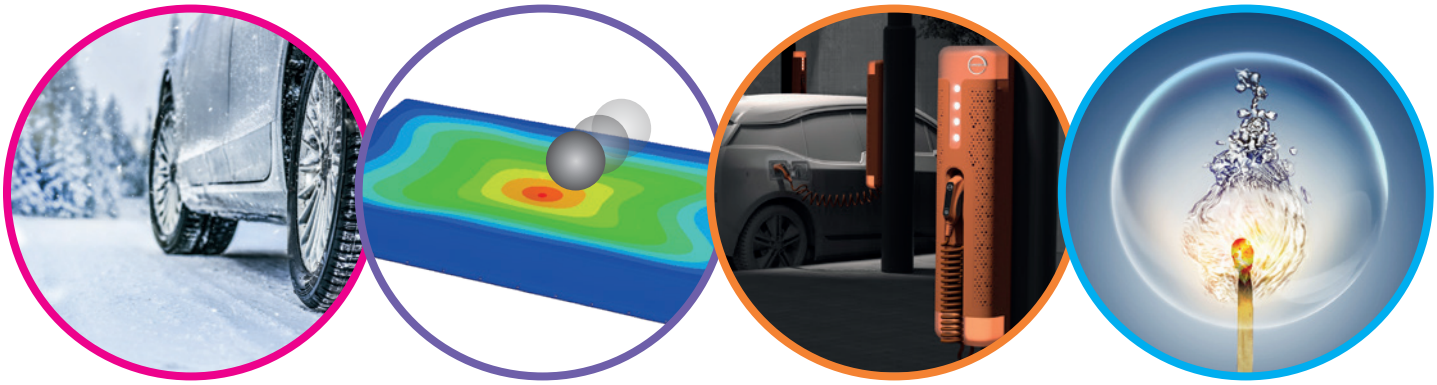
Covestro offers Makrolon® grades with UL flame class rating (UL 94 V-0/1.5 mm and 5VA/3.0 mm) and f1 listing to meet global EV charging requirements.

Co-design of EV charging devices

All of our EV charging station solutions build on our extensive expertise in electrical and automotive applications and partnerships with leading electrical vehicle supply equipment providers. The combination of industrial and material-specific knowledge is what drives value-adding services, which include:

- Color and design services
- Color, Material, Finish (CMF) services
- Mechanical testing
- Computer-aided engineering (CAE) analysis
- Processing technology advisory

Material solutions that meet the high requirements of the EV charging industry



Weathering resistance

Shields EV supply equipment against harsh weather conditions

Impact resistance

Protects electronic components against impact loads, e.g. vandalism, hail, etc.

Aesthetic design

Surface finishing with style-match design for OEMs

Safety

Flame retardant and secure against high currents

Main components for EV chargers

Outdoor weatherability

Impact resistance

Low temperature impact resistance

Flame retardancy (UL 94)

Heat resistance

Light guide light diffusion

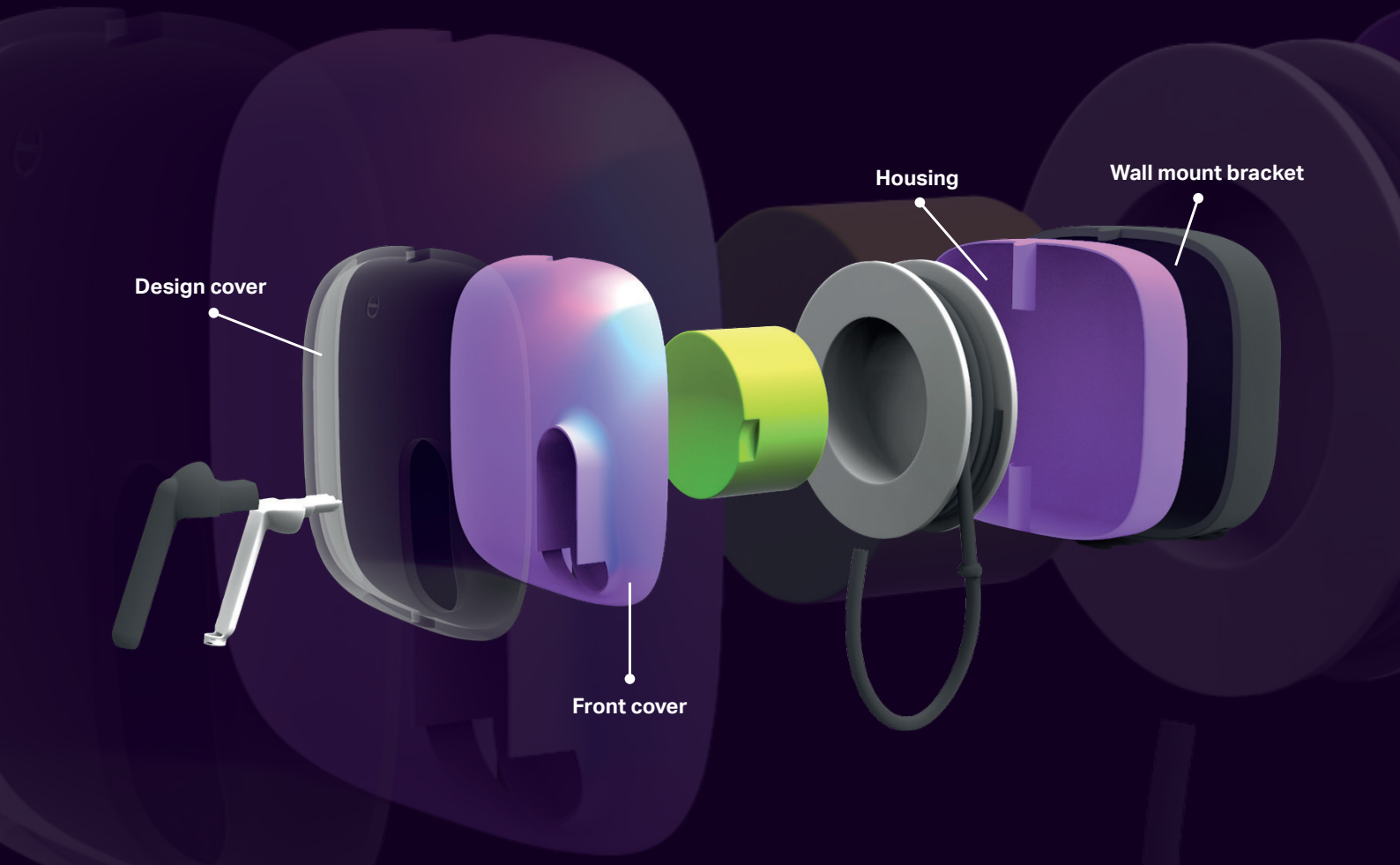
Signal transmittance

Colour & finish

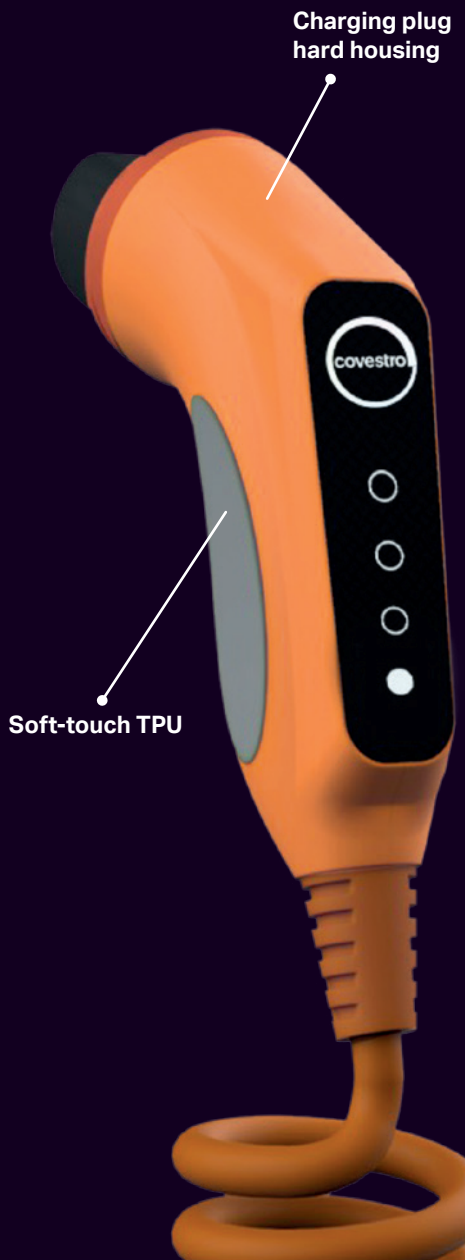
Chemical resistance

Bio-circular-attributed material

Housing and cover design recommended grades



Electric vehicle connector housing



Design cover

		Makrolon® 6557	Makrolon® 6557 RE	Makrolon® LED5902 FR	Makrolon® 6717	Makrolon® 2807	Makrolon® 2807 RE
Material		PC	PC	PC	PC	PC	PC
Sustainable share		–	up to 71.5% bio-circular*	–	–	–	up to 71.5% bio-circular*
MVR (300 °C; 1.2 kg)	**cm³/10 min**	10	10	6	3	9	9
UL 94 classi-fication	**mm**	UL 94 V-2/1.5 mm, V-0/3.0 mm, all colors	UL 94 V-2/1.5 mm, V-0/3.0 mm, all colors	UL 94 V-0/1 mm, 5VA/3 mm, CL	UL 94 V-0/2.0 mm, all colors	UL 94 V-2/0.75–2.4 mm, HB/2.5 mm, all colors	UL 94 V-2/0.75–2.4 mm, HB/2.5 mm, all colors
Izod notched impact	**(ISO 21305 / based on ISO 180/A), [kJ/m²] at 23 °C#**	65	65	50	60	70	70
	[kJ/m²] at different T [°C]	12 at -30 °C	12 at -30 °C	–	–	–	–
UV stabilized		yes	yes	yes	yes	yes	yes
f1 listed		yes	yes	pending	no	yes	yes

[1]Only in available in Asia
#Makrolon® grades tested at 3 mm and Bayblend® grades at 4 mm
*Attributed share of bio-circular feedstock via mass balance, ISCC PLUS (International Sustainability and Carbon Certification) certified
**Partly made from post-industrial recycled (PIR) content or post-consumer recycled (PCR) content
***Contact us for more information about Bayblend® and Makroblend® RE products

Housing, front cover, and wall mount bracket

Makrolon® 6487	Makrolon® 6487 RE	Makrolon® 6485 GR	Makrolon® FR6007 R20[1]	Makrolon® FR6020 RE	Makrolon® FR6040	Makrolon® 9417	Bayblend® FR3010 BBS910	Bayblend® FR3016 W
PC	PC	PC	PC	PC	PC	PC GF	PC+ABS	PC+ASA
–	up to 70.8% bio-circular*	30% PCR**	20% PCR**	up to 65,4 % attributed share	–	–	–	–
9	9	10	9	9	10	6	15 (240 °C/5 kg)	32 (240 °C/5 kg)
UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VB/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm, all colors	UL 94 V-0/1.5 mm, @2 mm	UL 94 V-0/0.75 mm, f1/3.0 mm
65	65	13	74	67	60	10	35	12
12 at –30 °C	12 at –30 °C	9	–	46 at –20 °C	45 at –30 °C	–	10 at –30 °C	5 at –30 °C
yes	yes	no	no	yes	yes	yes	yes	yes
yes	yes	no	no	yes	yes	yes (BK, GY)	–	yes

Sustainability

The polycarbonate RE grades are ISCC Plus certified* with partially bio-circular content, attributed via mass balance. Makrolon® RE and Bayblend® RE are renewable attributed grades that serve as drop-in solutions for their conventional complements. They give bio-waste a second life, leave a very low carbon footprint, and possess the same properties as standard grades for high-quality applications. Selected Makrolon® RE grades are even climate-neutral**. Our portfolio also includes mechanically recycled Makrolon® R and Bayblend® R grades with partially post-consumer or post-industrial recycled content. The transition to a global circular economy is a large-scale project that can only be achieved through cross-sector collaboration. We are always looking to join forces with industry partners to become fully circular together.

Covestro supports its customers with tailor-made material solutions. These solutions aim to reduce greenhouse gas emissions, create components from a recycling perspective, and establish material cycles to accelerate the transition to a circular economy.

*The methodology of our Life Cycle Assessment is based on the ISO 14040 standard, critically reviewed by TÜV Rheinland, considering biogenic carbon uptake. The calculation considers biogenic carbon sequestration based on preliminary supply chain data and the replacement of electricity grid mix with renewable electricity used for the manufacturing process. No offsetting measures have been applied.

**Climate neutrality is proven via an assessment of a partial product life cycle from resource extraction (cradle) to the factory gate, also referred to as cradle-to-gate assessment.

Innovation

We work with established designers and innovators and create partnerships with future talents. As a result, we are driving innovation in EV applications and envisioning the EV charging stations of the future. We create aesthetic, functional and circular designs with more sustainable material choices for EV chargers through integrated functionalities such as smart electronics, lighting, touch surfaces, connectivity (wireless, 4G/5G, NFC) and pave the way for a circular economy.

Here you find more information about our
innovative material solutions for charging stations

Lighting

Status indicators can also be implemented (e.g. standby mode and charging).

Lighting DQ

		Makrolon® DQ5122	Makrolon® DQ5142	Makrolon® DQ5162	Makrolon® DQ5922FR	Makrolon® DQ5942FR	Makrolon® DQ5962FR	Makrolon® 6557
Material		PC, diffusive	PC, diffusive	PC, diffusive	PC, diffusive	PC, diffusive	PC, diffusive	PC, transparent
Sustainable share		–	–	–	–	–	–	–
MVR (300 °C; 1.2 kg)	**cm³/10 min**	34	34	34	5	5	5	10
UL 94 classi-fication	**mm**	UL 94 V-2/0.75–2.2 mm	UL 94 V-2/0,75–2.2 mm	UL 94 V-2/0,75–2.2 mm	UL 94 V-0/0.8, 5VA 3 mm	UL 94 V-0/0.8, 5VA 3 mm	UL 94 V-0/0.8, 5VA 3 mm	UL 94 V-2/1.5 mm, V-0/3.0 mm, all colors
Izod notched impact	**(ISO 21305 / based on ISO 180/A), [kJ/m²] at 23 °C**	12 / based on ISO 179eA	12 / based on ISO 179eA	12 / based on ISO 179eA	9	7	12	65
	[kJ/m²] at different T [°C]	12 at –30 °C	12 at –30 °C	12 at –30 °C				12 at –30 °C
UV stabi-lized		yes	yes	yes	yes	yes	yes	yes
f1 listed		yes	yes	yes	pending	pending	pending	yes

#Makrolon® grades tested at 3 mm and Bayblend® grades at 4 mm
*Attributed share of bio-circular feedstock via mass balance, ISCC (International Sustainability and Carbon Certification) Plus certified
**Contact us for more info about our RE series, PCR portfolio or further products

Lighting Transparent

		Makrolon® 6557 RE	Makrolon® 6717	Makrolon® LED5902 FR
Material		PC, transparent	PC, transparent	PC, transparent
Sustainable share		up to 71.5% bio-circular*	–	–
MVR (300 °C; 1.2 kg)	**cm³/10 min**	10	3	6
UL 94 classi-fication	**mm**	UL 94 V-2/1.5 mm, V-0/3.0 mm, all colors	UL 94 V-0/2.0 mm, all colors	UL 94 V-0/1.0 mm, V-0, 5VA 3 mm
Izod notched impact	**(ISO 21305 / based on ISO 180/A), [kJ/m²] at 23 °C**	65	60	50
	[kJ/m²] at different T [°C]	12 at –30 °C	15 at –30 °C	
UV stabi-lized		yes	yes	yes
f1 listed		yes	no	pending

Charging plug housing

	Makrolon® FR6020	Makrolon® FR6020RE	Makrolon® FR6040	Makrolon® FR6011
Material	PC	PC	PC	PC
Sustainable share	–	up to 65.4% bio-circular*	–	–
MVR (300 °C; 1.2 kg) cm³/10 min	9	9	10	4
UL 94 classi-fication mm	UL 94 V-0/1.5 mm, 5VA/3.0 mm all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm all colors	UL 94 V-0/1.5 mm, 5VA/3.0 mm all colors	UL 94 V-0/1.5 mm, all colors
Izod notched impact (ISO 21305 / based on ISO 180/A), [kJ/m²] at 23 °C	67	67	60	70
[kJ/m²] at different T [°C]	46 at –20 °C	46 at –20 °C	45 at –30 °C	20 at –30 °C
UV stabi-lized	yes	yes	yes	yes
f1 listed	yes	yes	yes	no

#Makrolon® grades tested at 3 mm and Bayblend® grades at 4 mm
*Attributed share of bio-circular feedstock via mass balance, ISCC (International Sustainability and Carbon Certification) Plus certified
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