# Coroflex

High-voltage and charging cables for electric vehicles

Part of the **Coroplast** 

## **Technology leader for smart cable solutions worldwide.**

#### Experience and innovation from one single source.

Based in Germany, Coroflex is part of the Coroplast Group – a medium-sized, family-owned company operating on an international scale and among the technology leaders worldwide in its core fields of Wires & Cables, Technical Adhesive Tapes and Wire Harnesses. We guarantee customer proximity on a global level, employing some 8,200 trained people at 13 production locations in Germany, Poland, China, Tunisia, the USA, Mexico and Moldova as well as numerous representations worldwide. Customers around the world appreciate Coroflex as a technically leading manufacturer of wires and cables of outstanding quality. We work with confidence and great ambition to provide closely tailored solutions. We act swiftly to changing situations, and we are always right there where our customers need us most. Coroflex' distinguishing features are its agility and entrepreneurial attitude – consistently combined with the highest standards in terms of quality, production and operational processes.



## Innovations for innovations.

# Our innovative strength enables our customers to grow and implement the ideas that are driving the future of mobility.

Based on our innovative product developments, we offer technologically first-class quality that shows in our production processes and products, our logistical workflows and our constant ability to provide customers with on-thespot support. We meet the requirements of the automotive industry's international quality management system. All our Coroflex locations in Germany, Poland and China are certified in accordance with IATF 16949 and ISO 14001, guaranteeing globally accepted standards. In short, Coroflex is a leader in creating technically sophisticated solutions for demanding niches. We are much more than just a manufacturer. Customers often come straight to Coroflex with an initial idea – and our engineers provide them with individually designed products, tailor-made to suit their requirements.





## High-voltage cables - single core

Shielded and unshielded / Temperature class +180 °C (3.000 h)

Cable conductor sizes can be optimised by using our Coroflex silicone high-voltage cables, which perform at voltages of up to 600 volts a.c. and 1,000 volts d.c. and are able to permanently withstand temperatures up to 180 °C.

#### **Optimised dimensioning of conductor sizes**

With their ability to permanently withstand temperatures up to 180 °C Coroflex HV cables make it possible to optimise conductor sizes, in contrast to other inferior insulation materials. The specified current load can result in higher conductor temperatures. We can meet this challenge with our silicone insulation. Our simulation technologies enable us to calculate conductor temperatures depending on current loads and ambient temperatures. We can recommend to you optimised conductor cross-sections based on these results. Derating simulations help to find the optimal cross-section, reducing costs, weight and packaging space.

#### **Copper and aluminum**

Apart from the electric conductor material, Coroflex aluminum high-voltage cables do not differ from copper high-voltage cables. You can find the silicone insulation and sheathed materials – tried-and-tested in practice for many years – with unchanged qualities in Coroflex aluminum high-voltage cables. Existing connector housing and contacting geometries can also be adopted for Coroflex aluminum high-voltage cables.

#### Conductor sizes from 2.5 mm<sup>2</sup> to 120 mm<sup>2</sup>

Coroflex HV cables are available in conductor sizes ranging from 2.5 mm<sup>2</sup> to 120 mm<sup>2</sup> (copper and aluminum).

#### Ultrasonic welding test at the Coroflex laboratory



## High-voltage cables – multicore

Shielded and unshielded / Temperature class +180 °C (3.000 h)

Various OEM rely on Coroflex multicore high-voltage cables and their optimised performance.

### **Applications for Coroflex multicore HV cables**

- Air conditioning compressors
- PTC auxiliary heaters
- in-vehicle connection from the charging socket to the charging unit

## Easy processing

HV product family cables are all characterised by a well defined/tight-toleranced roundness, which makes wiring assembly manufacturing processing easier. The latest generation of multicore shielded or unshielded sheathed cables provide a filling layer on the core stranding for a circular design. The cable shielding can therefore be separated with rotative cutting systems in a safe process without the danger of damaging the actual core insulation. Furthermore, the time-consuming process of removing the filling elements and the separation can be avoided.

### **Highly flexible**

Coroflex multicore high-voltage cables can be used in the smallest of design spaces. Even with extremely small bending radii, the required electrical safety functionality is retained within the vehicles' entire lifespan.

## Conductor sizes from 2.5 mm<sup>2</sup> to 6.0 mm<sup>2</sup>

Coroflex multicore copper HV cables are available in the cross-section range from 2 x 2.5 mm<sup>2</sup> to 5 x 6.0 mm<sup>2</sup>.

Production of silicone HV cables at the Coroflex headquarter in Wuppertal



# Charging cables for all global market types

Coroflex charging cables are designed and optimised for all markets in terms of charging modes and meet a variety of global cable standards and requirements in terms of mechanical stability and electrical safety.

## First cable manufacturer for VDE approval according to EN 50620

Since 2017 the requirements for charging cables for electric vehicles have been in Europe created and were specified in the new standard EN 50620.

Coroflex received as first manufacturer from the VDE testing and certification institute the approval of signs for charging connection cables according to this standard.

#### EU market type H07BZ5-F charging cables

- > TPU sheathed cables
- Approved in accordance with European standard EN 50620
- Pilot cores for communication between road vehicle and charging electronics
- Maximum permanent temperature of 90 °C
- Extremely flexible
- Flame-retardant
- > good resistance to microbes and chemicals

## US market type EVE and EVJE charging cables

- TPE sheathed cables
- Approved in accordance with UL62 and CSA C22.2 No. 49
- Pilot cores for communication between road vehicle and charging electronics
- , Flame-retardant
- Maximum permanent temperature of 105 °C
- EVJE cables: maximum operating voltage of up to 300 volts a.c.
- EVE cables: maximum operating voltage of up to 600 volts a. c.

#### CN market type EV and EYU charging cables

- TPU sheathed cables
- CQC approvals in accordance with GB/T 33594 (comparable to the European H07BZ5-F standard)
- Pilot cores for communication between road vehicle and charging electronics
- Maximum permanent temperature of 90 °C
- Extremely flexible
- Flame-retardant
- Highly resistant to microbes and chemicals



Charging cables for electric vehicles

# Advanced technologies for the future of e-mobility

Whether lightweight design, automation, or any other requirement, we continuously develop improved high-voltage cables that meet the increasing needs of the electric vehicles of the future.

#### Automated processing of high-voltage cables

Coroflex HV cables are ideally designed for the requirements of automated processing in wiring assembly manufacturing. The constant support of our development engineers during processing ensure our product family of HV cables is continuously developed.

We offer a variety of cable solutions, including lasermarkable HV cables that enable our customers to print QR codes on their cables, optimised stripping behaviour that increases our customers' production output, or jointly develop ultra sonic welding parameter that reduce development time, increase process capability and result in higher quality welds.

#### Actively coolable high-voltage cables

Coroflex' actively cooled high-voltage cables are the latest innovation in terms of lightweight technology. A liquid medium flows through the cable and cools down the current-heated conductor. Test results point to a high potential for integrating this Coroflex innovation in serial applications.

The derating behaviour of a cooled 35 mm<sup>2</sup> HV cable is comparable to a non-cooled 120 mm<sup>2</sup> HV cable. This next generation of cables offers our customers significant weight-saving potential.

Our support can help you achieve success – contact us to find out how we can help you with customized solutions to meet the technology requirements of the future. Our technology is applicable for shielded and unshielded copper and aluminum high-voltage cables.



Laser marking of high-voltage cables

#### Actively coolable high-voltage cables





www.coroflex-cable.com