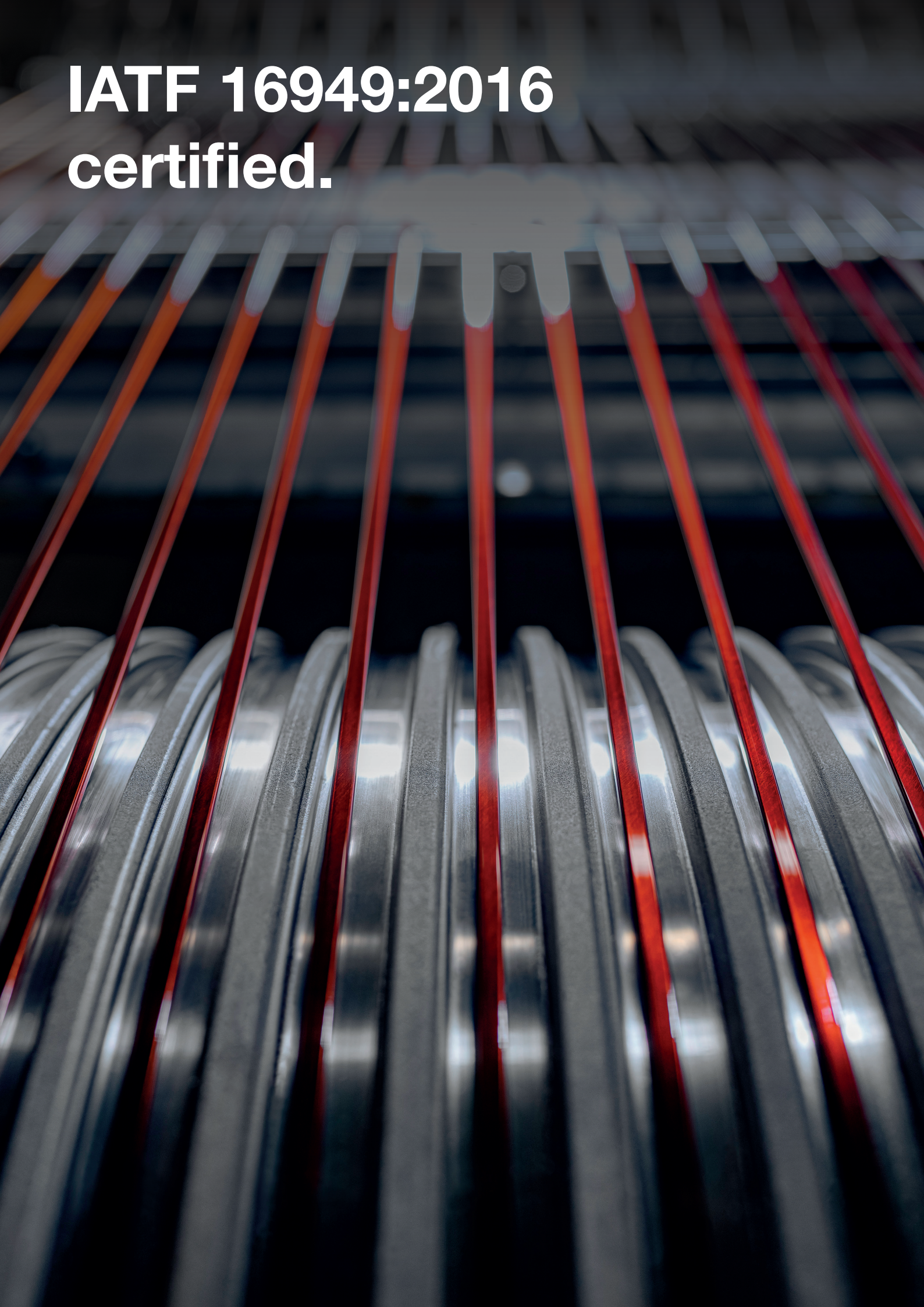
E - M O B I L I T Y

IATF 16949:2016 certified.



HIGH PERFORMANCE WIRES

State-of-the-art electric motors for EV's, PHEV's and HEV's require new and sophisticated solutions – especially in the field of stator winding and insulation materials. HPW – as a specialist for flat insulated copper winding wires over decades – developed different solutions suitable for various applications, voltage levels and other special requirements.

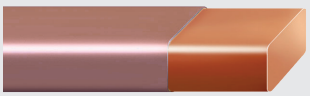
Starting from bare copper rod, we cover the entire manufacturing process including surface preparation and cleaning, rolling, drawing and insulation. Our enamel insulated wires with improved properties significantly reduce typical failure rates in the industry. For high voltage applications we offer extruded insulation systems out of high performance polymers such as PEEK or PI setting a new industry standard and targeting specific requirements of our customers.

Enameled Flat Wires

Smooth, even surface
Good adhesion on copper surface
Extremely low failure rate (< 1 fault / 1000m)
Failure marking upon customers request

Comparison of properties of different insulation systems

Surface	even, closed
Temperature class	200
Possible Coating Thickness	max. 170µm
Flexibility in Coating Thickness	+
Minimum Bending Diameter	min. 2x bare wire width/thickness
Electr. Properties	+
Aging Resistance	~
Corona Resistance	-
Possible Wire Shape	only Flat



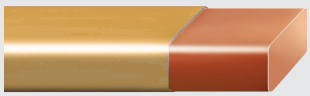
Extruded PEEK insulated Flat & Round Wires

Smooth, even surface

Excellent adhesion on copper surface without any further bonding layer

High flexibility of insulation material

Very good aging and PD resistance



Extruded Polyimide insulated Flat & Round Wires

Smooth, even surface

Excellent adhesion on copper surface without any further bonding layer

High flexibility of insulation material

Very good aging and PD resistance

Polyimide-film insulated Flat & Round Wires

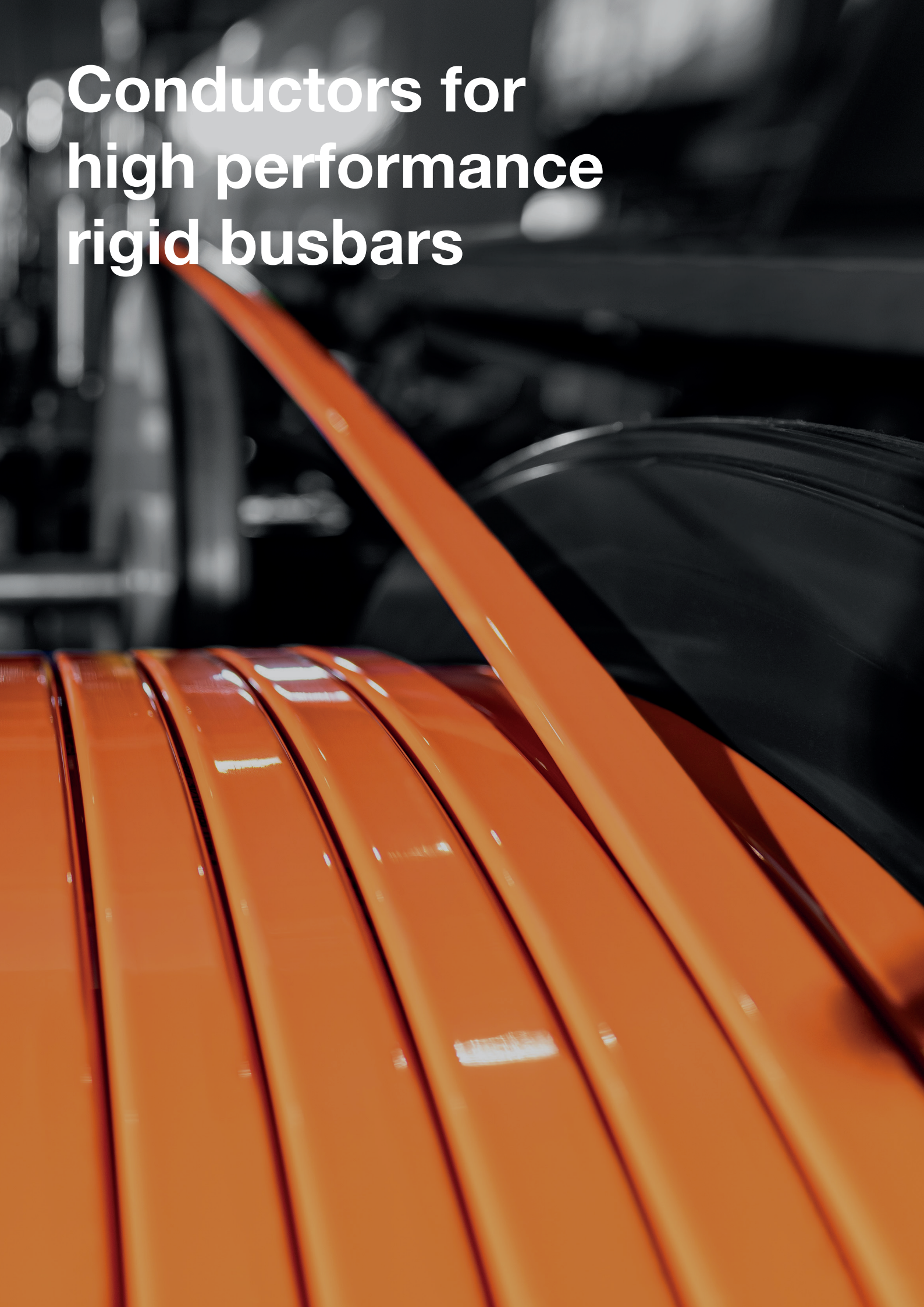
Good adhesion on copper surface

Proven insulation material

Standard insulation material in traction motors for decades

	even, closed	even, closed	un-even, with tape edges
	240-260	240	240
	max. 300µm	max. 300µm	max. 230µm (two layers)
	++	++	~
	min. 1x bare wire width/thickness	min. 1x bare wire width/thickness	min. 2x bare wire width/thickness
	++	++	++
	++	+++	+
	+++	+++	+
	Flat & Round	Flat & Round	Flat & Round

Detailed information regarding oil- and PD-resistance may be provided upon request.



Conductors for high performance rigid busbars

Rigid Busbars are used in electric vehicles – they require outstanding dimensional and insulation properties. Narrow bending angles cause high mechanical stress in conductor and insulation. Therefore highest possible bonding properties between conductor and insulation are needed.

PA12-BUSBAR WIRES

- Conductor material Aluminium or Copper
- Excellent adhesion on conductor surface
- No bonding layer between conductor and insulation
- Customer specified marking possible

PA12 insulated Busbars

Surface	even, closed
Width of conductor	max. 50 mm
Thickness of conductor	max. 8 mm
Insulation increase	0,25 – 1 mm
Tensile strength (Cu)	200 – 270 N/mm²
Tensile strength (Al)	60 – 95 N/mm²
Elongation (Cu)	≥ 32%
Elongation (Al)	≥ 25%
Springback angle (Cu)	≤ 6,0°
Springback angle (Al)	≤ 6,0°
Color	RAL 2003 – RAL 2008

www.hpwires.com