



## Copper Wire, round, enamelled, type V 180

Description	The enamelled copper wire type V 180 is a winding wire with a round copper conductor according to EN13601 Cu-ETP with a polyurethane coating.
Properties	<p>Type V 180 is a thermal class H (180 °C) enamelled copper wire which can be directly soldered.</p> <p>A special feature of the enamelled copper wire type V 180 is its high long-term thermal resistance at elevated temperatures and thermal short-term overload stability combined with its ability to be soldered directly at a solder bath temperature of approx. 390 °C without previous mechanical dissolving of the coating. Type V 180 is also suitable for bonding techniques, such as welding, connecting and crimping, and fulfils the requirements of modern winding technology.</p> <p>State-of-the-art process technology ensures excellent formability, high elongation and good insulating properties.</p> <p>The chemical resistance to aggressive, fluid or gaseous media is limited; therefore, compatibility tests are recommended prior to application.</p>
Application	The enamelled copper wire type V 180 is used in small transformers, coils, relays, conductors and solenoid coils, and occasionally also in low voltage motors and small motors.
Standards	IEC 60317-51 DIN EN 60317-51 IEC 60317-0-1 DIN EN 60317-0-1 IEC 60851 series DIN EN 60851 series NEMA MW-82C UL approved RoHS compliant according to 2011/65 EC
Delivery format	Grade 1: 0.03 – 2.00 mm Grade 2: 0.03 – 2.00 mm

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### Technical data

Typical material properties of the enamelled copper wire type V 180, Ø 0.5 mm, grade 1<sup>(4)</sup> according to DIN EN 60317-51 and 60317-0-1

	Unit	
<b>Mechanical</b>		
Outer diameter	mm	max. 0.544 mm
Adhesion and elongation		1 x d, no cracks
Elongation at break	%	≥ 25 %

	Unit	
<b>Electrical</b>		
Dielectric strength at RT	kV	≥ 2.4 kV
High voltage defects on 30 m NominalØ > 0.250 ≤ 0.500 mm		≤ 25 at 750 V
Electric conductivity	m/Ωmm <sup>2</sup>	58.5 m/Ωmm <sup>2</sup>

	Unit	
<b>Thermal</b>		
Temperature index TI		> 180
Softening temperature, tested		230 °C
Heat shock at 200 °C		2 x d, no cracks
Solderability at 390 °C		≤ 4 s

	Unit	
<b>Chemical</b>		
Enamel pencil harness after storage ½ h/ 60 °C in alcohol		min. H
Enamel pencil harness after storage ½ h/ 60 °C in standard solvent		min. H

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	Unit	
Chemical		
Resistance to commercial impregnants <sup>(1)</sup>		yes
Resistance to commercial refrigerants <sup>(1)</sup>		no
Resistant to dry transformer oils <sup>(1)</sup>		not recommended
Resistance to hydraulic oils <sup>(1)</sup>		no

(1)

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Index	<p>(1) Due to the variety of individual applications we cannot make any generally binding commitments regarding the compatibility. We recommend testing compatibility with the materials being used.</p> <p>(2) Insulating varnish not polyamide modified.</p> <p>(3) Not recommended for use in oil transformers.</p> <p>(4) Tested according to IEC 60851-series, or DIN EN 60851-series, if not otherwise stated. The values shown correspond to the minimum requirements of the stated DIN EN standards. These standards do not provide a guarantee of suitability for certain applications.</p>
Temperature index (TI)	<p>The temperature index is a dimensionless value and represents the long term thermal resistance or the admissible ageing temperature of the enamelled copper wire in °C for an extrapolated life span of 20,000 h. The temperature index does not necessarily correspond to the thermal class.</p>
Thermal class	<p>Enamelled copper wires according to IEC 60317-.. or DIN EN 60317-... are to be rated as Class X, if</p> <p>(a) their long term thermal performance demonstrably proves an extrapolated life span of 20,000 h at an ageing temperature of min. X °C (tests preferably to be made on enamelled copper wires with a nominal diameter of 1.00 mm Grade 2) and</p> <p>(b) the heat shock resistance complies with temperatures of 25 or 20°C above the rated thermal class.</p>

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