
SHTherm® 210 TE

- Enamelled round copper wire, thermoresistant, spike resistant
- Insulated with THEIC mod. polyesterimide plus polyamide-imide overcoat
- Class 200

Attributes

SHTherm® 210 TE is a highly thermoresistant enamelled copper wire of heat performance class N with a wide range of excellent quality features. As it is a dual-coat wire its insulation film consists of 2 different coatings on top of one another. These ensure: a very good permanent thermal and overload resistance, excellent resistance to chemical attacks e.g. by alkalines, washing and cleaning agents, impregnating varnishes and resins, sealing compounds, thinners, solvents and refrigerants as well as their vapours, an excellent mechanical abrasion resistance and a very low coefficient of friction of the wire surface. This range of excellent features makes SHTherm® 210 TE an all-round wire meeting the requirements of all applications requiring above average resistance to chemical, thermal, mechanical and electrical loads which occur during processing or during operating conditions. High coating resistance to abrasion and a low coefficient of friction result in less stress and damage to the wire and maintain a higher and more constant dielectric insulating resistance of the insulation film. The consistent further developments carried out by our R&D team allow this excellent “all-round” wire to be optimised to take into account specific customer requirements (e.g. improved adhesion after ageing, workability, electrical characteristics). The varnish system is designed to be resistant to partial discharge.

Application

E-Mobility, electric motors

Standards

IEC / DIN EN 60317-13

NEMA MW 35-C / 73-C

Delivery forms

Grade 1: on request

Grade 2: on request

Typical properties of enamelled round copper wire 0.500 mm, with insulation film grade 1

Mechanical	Unit of measure	Sollwert	Istwert
Overall diameter	mm	min. 0.524 - max. 0.544	actual value = set value
Bare wire diameter	mm	0.495-0.505	as set value
Adhesion (no cracks in film after winding)		mandrel diameter 0.500 mm	1 x d / 10 % pre-elongation
Scrape resistance	N	≥ 3.950	≥ 7.500
Pencil hardness		H	4H - 5H
Elongation at break	%	≥ 28	≥ 38
Coefficient of friction	μ	/	≤ 0,140
Bare wire diameter	mm	0.495-0.505	as set value
Coefficient of friction	μ	/	≤ 0,140
Elongation at break	%	≥ 28	≥ 38
Pencil hardness		H	4H - 5H
Scrape resistance	N	≥ 3.950	≥ 7.500
Adhesion (no cracks in film after winding)		mandrel diameter 0.500 mm	1 x d / 10 % pre-elongation
Overall diameter	mm	min. 0.524 - max. 0.544	actual value = set value

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.

Updated 06/18



Thermal	Unit of measure	Sollwert	Istwert
Temperature index TI	°C	200	210
Cut through temperature (pre-heated block)	°C	320	≥ 360
Dielectric loss factor (bending point)	(°C) (tan δ)	/	≥ 185
Heat shock at 220 °C (no cracks in varnish coat after winding)		mandrel diameter 1.120 mm	1 x d / 10 % pre-elongation
Solderability		no	no
Solderability		no	no
Heat shock at 220 °C (no cracks in varnish coat after winding)		mandrel diameter 1.120 mm	1 x d / 10 % pre-elongation
Dielectric loss factor (bending point)	(°C) (tan δ)	/	≥ 185
Cut through temperature (pre-heated block)	°C	320	≥ 360
Temperature index TI	°C	200	210

Electrical	Unit of measure	Sollwert	Istwert
Dielectrical strength at RT	kV	≥ 2.4 (twist)	≥ 3 (cylinder)
High voltage discontinuities 750V		≤ 10 on 30 m	≤ 7 on 100 m
Electrical conductivity	MS/m	58 - 59	≥ 58.5

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.

Updated 06/18



Electrical	Unit of measure	Sollwert	Istwert
Electrical conductivity	MS/m	58 - 59	≥ 58.5
High voltage discontinuities 750V		≤ 10 on 30 m	≤ 7 on 100 m
Dielectrical strength at RT	kV	≥ 2.4 (twist)	≥ 3 (cylinder)

Chemical	Sollwert	Istwert
Pencil hardness (storage in standard solvent ½ h / 60 °C)	min. H	3H - 5H
Pencil hardness (storage in alcohol ½ h / 60 °C)	min H.	3H - 5H
Resistance to commercial impregnants^(1)	/	yes
Resistance to commercial refrigerants^(1)	/	yes
Resistance to commercial dry transformer oils^(1)	/	yes
Resistance to commercial hydraulic oils^(1)	/	yes
Resistance to commercial hydraulic oils^(1)	/	yes
Resistance to commercial dry transformer oils^(1)	/	yes
Resistance to commercial refrigerants^(1)	/	yes
Resistance to commercial impregnants^(1)	/	yes
Pencil hardness (storage in alcohol ½ h / 60 °C)	min H.	3H - 5H
Pencil hardness (storage in standard solvent ½ h / 60 °C)	min. H	3H - 5H

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.

Updated 06/18



(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.