SynFlex Elektro GmbH
Auf den Kreuzen 24
D-32825 Blomberg Germany
Telefon +49-5235-968-0
E-Mail info@synflex.de

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

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Updated 06/18

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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	
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	as set value	

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

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Thermal	Unit of measure	Sollwert	Istwert
Solderability		no	no

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

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

(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.

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