

Fiber-insulated wires

Silix® enameled round

- **Enameled round copper wire insulated with glass yarn**
- **Winding wire with excellent thermal and chemical resistance**
- **Temperature Index 180 or 200**

General description

Thermex®200 Silix round wires are insulated with a single or double covering of glass-yarn fibers (SILIX®), available in three different versions:

V180: impregnated with modified polyesterimide varnish.

V180K: impregnated with modified polyesterimide varnish in a thermal-adhesive version.

VS: impregnated with silicone-based varnish.

Silicone impregnation is not available in the thermal-adhesive version.

Users should consider that a silicone impregnation gives a lower level of adhesion than polyesterimide impregnations (see IEC 60317-50 standards).

Application

- Motors up to 6 kV
- Motors and magnet coils subjected to constantly high thermal and mechanical stress.

Conventional Types

Enameled copper wires Thermex 200 Grade 2, insulated with:

- 1 fine or reinforced impregnated covering layer 1xSilix
- 2 fine or reinforced impregnated covering layers 2xSilix

Coating varnishes:

- polyesterimide, V180
- polyesterimide 'B'-staged varnish V180K
- silicone VSi

Conductor diameter: 0,80 to 6,00 mm

The standard diameters of the conductors (nominal diameter) comply with standard IEC 60317-0-6.

Build Criteria Round Wire

Nominal bare wire diameter d (mm)	Max. increase in Dimension (mm)			
	Glass fiber covering over grade 2 enameled conductor			
	Single covering 1Silix		Double covering 2Silix	
	Fine	Reinforced	Fine	Reinforced
0.80 < d ≤ 1.40	0.13 to 0.18	0.15 to 0.20	0.20 to 0.25	0.30 to 0.35
1.40 < d ≤ 2.00	0.19 to 0.23	0.24 to 0.27	0.26 to 0.31	0.31 to 0.36
> 2.00	0.19 to 0.23	0.24 to 0.27	0.30 to 0.36	0.34 to 0.40

Standards

SILIX®-covered round enameled copper wires meet the requirements of IEC Publications 60317-0-6:
 60317-49 (TI 180) V180 and V180K
 60317-50 (TI 200) VSi

The test methods are based on IEC Publication 60851:

- 60851-1 General
- 60851-2 Definition of dimensions
- 60851-3 Mechanical properties
- 60851-4 Chemical properties
- 60851-5 Electrical properties
- 60851-6 Thermal properties

Advantages

- Excellent resistance to high temperatures in continuous mode, depending on the type of impregnation used.
- Good resistance to chemicals (solvent of impregnating varnishes).
- Good resistance to abrasion and scraping.

Processing Instructions

The nature of the insulation calls for some precautions. For the items with a thermal adhesive bond coat (K), the storage time is limited to 1 year at room temperature and 60 % relative humidity.

Order Data

Quantity, Designation, Supply Form e.g.:
 The designation shall comprise:

For round shape: RD
 Designation of the insulation: 2Silix V180 fine
 Nominal dimension in mm: 2.24
 Reel type: e.g. DIN 355

Example of complete order:

2000 Kg RD TX200 G2 2Silix V180 F 2.24mm D355

		TX200 G2 1 or 2Silix V180 (K)	TX200 G2 1 or 2Silix VSi	Test standard
Mechanical properties				
Springiness /diameter above 1.60 mm	°	≤ 5.5	≤ 5.5	IEC60851-3 test 7
Flexibility - Mandrel winding 10xd		no cracks	no cracks	IEC60851-3 test 8
Adherence after elongation	10 %	no loss of adhesion	no loss of adhesion	IEC60851-3 test 8
Shear strength (for V180K only)	N/mm ²	≥ 3	na	Delle test 1.47.14
Electrical properties				
Breakdown voltage after winding 10xd 1Silix	V	≥ 2750	≥ 2750	IEC60851-5 test 13
Breakdown voltage after winding 10xd 2Silix	V	≥ 3000	≥ 3000	IEC60851-5 test 13
Thermal properties				
Heatshock 30 min / 200 °C after winding 12xd		no cracks	no cracks	IEC60851-6 test 9
Thermal endurance	TI	180	200	NEMA MW 1000

Appearance

Slight color variations are raw material or process-related and have no influence on the technical properties of the wire

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