

# Fiber-insulated wires

## Silix® round

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

### General description

SILIX®-covered bare round wires are insulated with a 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.

**VSi:** 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 and magnet coils subjected to constantly high thermal and mechanical stress
- Thermo-elements

### Conventional Types

Covered bare copper wires, insulated with:

- 2 fine or reinforced impregnated covering layers
- coating varnishes: epoxy, polyesterimide, silicone, 'B'-Staged varnish

Conductor diameter: 0,80 to 6,00 mm

The standard diameters of the conductors (nominal diameter) comply with standard IEC 60317-0-1.

### Build Criteria Round Wire

Bare conductor nominal diameter d (mm)	Max. increase of dimensions (mm)	
	Glass fiber covering over bare conductor	
	Double covering	
	Fine	Reinforced
0.80 ≤ d ≤ 1.40	0.13 to 0.20	0.19 to 0.22
1.40 < d ≤ 2.00	0.13 to 0.20	0.21 to 0.25
d > 2.00	0.19 to 0.22	0.21 to 0.25

### Standards

SILIX®-covered round bare copper wires meet the requirements of IEC Publications 60317-0-6, 60317-49 (TI 180) and 60317-50 (TI 200).

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 mineral oil and corrosive vapors.
- 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
Nominal dimension in mm:	2.24
Conductor material:	Cu
Designation of the insulation:	2Silix V180 Fine
Reel type: e.g.:	DIN 355

Example of complete order:

2000 Kg RD 2Silix V180 Fine Ø 2.24mm D355

		<b>2Silix V180 (K)</b>	<b>2Silix VSi</b>	<b>Test standard</b>
<b>Mechanical properties</b>				
Springiness /diameter above 1.60 mm	°	≤ 5.0	≤ 5.0	IEC60851-3 test 7
Flexibility - Mandrel winding 10 x d		no cracks	no cracks	IEC60851-3 test 8
Adherence after elongation	20 %	no loss of adhesion	no loss of adhesion	IEC60851-3 test 8
Shear strength (for V180K only)	N/mm <sup>2</sup>	≥ 3	na	Delle test 1.47.14
<b>Electrical properties</b>				
Breakdown voltage after winding 10xd	V/mm	≥ 2200	≥ 2200	IEC60851-3 test 13
<b>Thermal properties</b>				
Heat shock 30 min / 200 °C after winding 12 x d		no cracks	no cracks	IEC60851-3 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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