

Fiber-insulated wires

Silix® flat

- Flat bare copper wire insulated with glass yarn
- Winding wire with excellent thermal and chemical resistance
- Temperature Index 180 or 200

Bare conductor width w (mm)	Max. increase in dimension (mm)		
	Glass fibre covering over bare conductor		
	Double covering		
	Extra-Fine	Fine	Reinforced
2.00 to ≤ 3.15	0.15 to 0.20	0.18 to 0.23	0.27 to 0.33
3.15 to ≤ 7.10	0.18 to 0.22	0.21 to 0.26	0.32 to 0.38
7.10 to ≤ 8.50	0.18 to 0.22	0.21 to 0.26	0.36 to 0.44
> 8.80, A > 30 mm ²	0.20 to 0.26	0.28 to 0.33	0.36 to 0.44

General description

SILIX® covered flat wires are insulated with a single or double covering of glass-yarn fibers and impregnated with varnishes. This type of wire is 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 60317-33 standards).

Application

Windings for transformers, generators or motors.

Conventional Types

Covered bare copper wires, insulated with:

- 2 fine or reinforced, impregnated covering layers 2Silix

coating varnishes:

- modified polyesterimide,
- modified polyesterimide, 'B'-Staged varnish
- silicone

Cross section: 2 to 80 mm²
 Width: 2.00 to 22.00 mm
 Thickness: 1.00 to 6.00 mm

The standard dimensions of the conductors (nominal dimension), the tolerances and the overall dimensions of the wire comply with the IEC standard 60317-0-4.

Build Criteria Rectangular Wire

Standards

SILIX®-covered flat bare copper wires meet the requirements of IEC Publications 60317-0-4:
 60317-31 (TI 180) V180 and V180K
 60317-33 (TI 200) VS

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

- Good resistance to mineral oil and corrosive vapors.
- Excellent resistance to high temperatures in continuous mode, according to the type of impregnation used.

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:

Conductor material: Cu
 Designation of the insulation: 2Silix V180 Fine
 Nominal dimension in mm: 2.24 x 5.00 mm

Reel type: e.g. DIN 500

Example of complete order:

2000 kg FL 2Silix V180 F 2.24x5.00mm D500

		2Silix V180 (K)	2Silix VSi	Test standard
Mechanical properties				
Elongation at break / thickness up to 2.5 mm	%	≥ 30	≥ 30	IEC 60851-3 test 6
Elongation at break / thickness above 2.5 mm	%	≥ 32	≥ 32	IEC 60851-3 test 6
Springiness	°	≤ 5.5	≤ 5.5	IEC60851-3 test 7
Flexibility -Flatwise bent on mandrel Ø 10 x thickness		no cracks	no cracks	IEC60851-3 test 8
Flexibility if width up to 10 mm Edgewise bent on mandrel Ø 7 x thickness		no cracks	no cracks	IEC60851-3 test 8
Flexibility if width above 10 mm Edgewise bent on mandrel Ø 8 x width		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 bending 1Silix	V/mm	≥ 2200	≥ 2200	IEC60851-5 test 13
Breakdown voltage after bending 2Silix	V/mm	≥ 2400	≥ 2400	IEC60851-5 test 13
Thermal properties				
Heat shock 30 min /180 °C if width up to 10 mm Edgewise mandrel Ø 9xwidth		no cracks		IEC60851-6 test 9
Heat shock 30 min /200 °C if width up to 10 mm Edgewise mandrel Ø 9xwidth			no cracks	IEC60851-6 test 9
Heat shock 30 min /180 °C if width > 10 mm Edgewise mandrel Ø 10xwidth		no cracks		IEC60851-6 test 9
Heat shock 30 min /200 °C if width > 10 mm Edgewise mandrel Ø 10xwidth			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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