Fibre-insulated wires

VS 220 RENF flat

- **Fibre-insulated wire for windings in rotating machines**
- **Temperature Index 220**

General description
VS 220 RENF is an enameled flat copper wire insulated with a reinforced polyamide-imide impregnated glass and polyester fibre blend covering.

Application
Stator and rotor windings.

Conventional types
VS 220 RENF is available for:

Cross section: 2 to 80 mm2
Width: 2 to 22 mm
Thickness: 1 to 5 mm

The standard dimensions of the conductors (nominal dimensions), the tolerance and the overall dimension of the enameled wire, complies with the IEC standard 60317-0-2.

Standards
There are no existing IEC standards for VS 220 wires today.
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
- Very high thermal resistance
- Very good dielectric properties
- Covering with high mechanical strength

Order data
The designation shall comprise:
For rectangular shape: FL
Description of the insulation: VS 220 RENF
Reel type: e.g.: DIN 500

Complete order:
2000 kg FL VS220 RENF 2.24 x 5.00mm D500

	unit	value	Test standard
Increase due the insulation			
For width above 2.00 mm	mm	0.25 to 0.30	
Mechanical properties			
Elongation at break thickness up to 2.5 mm	%	≥ 30	IEC60851-3 test 6
Elongation at break thickness above 2.5 mm	%	≥ 32	IEC60851-3 test 6
Springiness	°	≤ 5.5	IEC60851-3 test 7
Adherence after elongation	20 %	No loss of adhesion	IEC60851-3 test 8
Flexibility - if width up to 10 mm - edgewise bent on mandrel Ø 3 x width	visual	no cracks	IEC60851-3 test 8
Flexibility - if width above 10 mm - edgewise bent on mandrel Ø 4 x width	visual	no cracks	IEC60851-3 test 8
Flexibility - flatwise bent on mandrel Ø 3 x thickness	visual	no cracks	IEC60851-3 test 8
Electrical properties			
Break down voltage after bending	V	≥ 2400	IEC60851-5 test 13
Thermal properties			
Heat shock 30 min / 240 °C if width up to 10 mm - edgewise mandrel Ø 5 x width	visual	no cracks	IEC60851-6 test 9
Heat shock 30 min / 240 °C if width above 10 mm - edgewise mandrel Ø 6 x width	visual	no cracks	IEC60851-6 test 9
Thermal endurance	TI	220	IEC60172

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