

# Enameled wires

## Thermex 220<sup>®</sup> copper FL

- Enameled winding wire with excellent mechanical,
- thermal and chemical properties
- Insulation based on polyamide-imide enamel
- Temperature Index 220

### General description

THERMEX<sup>®</sup> 220 rectangular-shaped wires are enameled with an excellent thermal base insulation based on polyamide-imide. The polyamide-imide coating ensures outstanding mechanical and chemical properties of the insulation.

### Application

- Windings in highly stressed AC and DC motors of class H ... 200
- Electromagnets
- Dry transformers
- Oil filled transformers, in compliance with IEC60851-4 hydrolysis test.

### Conventional Types

Rectangular copper wires:

- Thickness: 0.50 to 6.00 mm
- Width: 2.00 to 20 mm
- Cross-section: 2 to 80 mm<sup>2</sup>
- Coating class: Grade 1 and Grade 2

### Standards

THERMEX<sup>®</sup> 220 flat wires meet the requirements of IEC 60317-58. The standard dimensions of the conductors (nominal dimension) and the tolerances comply with the standard IEC 60317-0-2.

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

Because of their high thermal stability and their good mechanical and thermal properties THERMEX<sup>®</sup> 220 rectangular wires are particularly suitable for coils subjected to constantly high temperatures and mechanical stresses.

### Order Data

The designation shall comprise:

Shape of the wire:	Flat
Designation of the insulation:	THERMEX 220
Coating class:	Grade 2
Nominal dimension in mm:	2.24 x 5.00
Reel type: e.g.:	DIN 500

Example of complete order:

2000 kg FL TX 220 G2 2.24 x 5.00 mm D500

### Characteristics of Thermex 220

	unit	value	Test standard
<b>Mechanical properties</b>			
Insulation increase Grade 1	mm	0.06 - 0.11	IEC60851-2
Insulation increase Grade 2	mm	0.12 - 0.17	IEC60851-2
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	°	≤ 5.0	IEC60851-3 test 7
Adherence after elongation	20 %	No loss of adhesion	IEC60851-3 test 8
Flexibility - edgewise bent on mandrel Ø 2 x width		no cracks	IEC60851-3 test 8
Flexibility - flatwise bent on mandrel Ø 2 x thickness		no cracks	IEC60851-3 test 8
<b>Electrical properties</b>			
Break down voltage Grade 1	V	≥ 1000	IEC60851-5 test 13
Break down voltage Grade 2	V	≥ 2000	IEC60851-5 test 13
<b>Thermal properties</b>			
Heat shock 30 min /240 °C mandrel Ø 2 x width		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.

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