Enameled wires

Thermex 220® Grade 3 FL

- **Enameled winding wire with excellent mechanical,**
- **thermal and chemical properties**
- **Insulation based on polyamide-imide enamel**
- **Special coating class Grade 3**
- **Temperature Index 220**

General description
THERMEX® 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
- E-drives in automotive

Conventional Types
Rectangular copper wires:
- Thickness: 1.00 to 6.00 mm
- Width: 2.00 to 20 mm
- Cross-section: 2 to 80 mm2
- Coating class: Grade 3

Standards
THERMEX® 220 flat wires meet the requirements of IEC 60317-58. There are no standards today for coating class Grade 3. 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® 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 3 (G3)
Nominal dimension in mm:	2.24 x 5.00
Reel type: e.g.:	DIN 500

Example of complete order:
2000 kg FL TX 220 G3 2.24 x 5.00 mm D500

Characteristics of Thermex 220 G3

	unit	value	Test standard
Mechanical properties			
Increase due to insulation	mm	≥ 0.18 *	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
Electrical properties			
Break down voltage	V	≥ 3000	IEC60851-5 test 13
Thermal properties			
Heat shock 30 min /240 °C mandrel Ø 1 x width		no cracks	IEC60851-6 test 9
Thermal endurance	TI	220	IEC60172

(*) maximal increase of dimension due to enamel to be defined according to section of conductor.

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