Enameled wires

Thermibond® TS

- **Enameled winding wire with a surface layer of thermosetting adhesive**
- **Temperature Index 220**

General description
THERMIBOND® TS rectangular wires are insulated with a modified polyamide-imide varnish resulting in good thermal and mechanical properties and an overcoat of thermosetting bonding varnish of aromatic polyamide. When the temperature of windings of THERMIBOND® TS wires are raised above 180 °C, the surface film softens at first so that the windings can bond between each other and after that it cures. In this way the thermosetting bonding varnish of THERMIBOND® TS is well adapted to replace impregnating varnishes and makes the handling of the windings easier.

Application
- Stator windings of motors and generators

Conventional Types
Rectangular copper wires:

- Thickness:	2.00 to 6.00 mm
- Width:	4.00 to 20.00 mm
- Cross-section:	8 to 80 mm^2
- Coating class:	Grade 2

The standard dimensions of the conductors (nominal dimension), the overall dimensions and the tolerances comply with the standard IEC 60317-0-2.

Standards
There are no existing standards for this product at 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
- Cost savings: no varnish waste disposal, no procuring of impregnating agents, less working area needed, shorter manufacturing cycles - Environmental: no pollution, clean and safe working places, without fire or explosion hazard.
- Technical: very good thermal resistance, high bonding strength.
- Better reliability: homogeneity of coating, no influence of solvents or impregnating agents.

Processing Instructions
Windings made of THERMIBOND® TS have to be cured at temperatures between 180 and 200 °C. Optimal results are obtained when the windings are compressed during the phase of heating at min. 0.04 N/mm2. The curing temperature has to be kept for at min. 30 minutes before cooling down the windings. Pay special attention previously to not elongate the wire during the winding operations.

Storage Conditions
THERMIBOND® TS wires have to be stored protected from light. All reels must be covered during storage. Storage time is limited to 1 year at room temperature.

Order Data
Quantity, Designation, Supply form e.g.:

The designation shall comprise:

For rectangular shape of wire:	FL
Designation of the insulation:	THERMIBOND TS
Nominal dimension in mm:	2.24 x 5.00
Reel type: e.g.:	VM 630

Example of complete order:
2000 kg FL TB TS 2.24x5.00mm V630

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	unit	value	Test standard
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	°	≤ 5.0	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 Grade 2	V	≥ 2000	IEC60851-5 test 13
Thermal properties			
Heat shock 30 min /240 °C mandrel Ø 2 x width		no cracks	IEC60851-6 test 9
Bonding temperature	°C	180 200	
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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