

Rigid Insulation

Transformer Board – Elboard & HDLC

GENERAL

Transformer Board sheets are dried under compression, at elevated temperature, in a hydraulic stack press with heated plates between the sheets. The heated plates are covered with a wire mesh to let the water escape which leaves a characteristic cloth mark on the surfaces of the board.

Pre-compressed board is a material with maximum density, tensile strength, compression stiffness, and flexural strength.

The material is fully impregnable with transformer oil and is free from the knots or crevasses that could give rise to partial discharge inception in the major insulation structure of the transformer.

Machining of parts from pre-compressed laminate gives excellent results, but only when sharp tools and correct cutting speeds are used.

APPLICATION

This material is developed for applications where high stiffness and tensile or flexural strength is required. It is ideal for such applications as:

- Spacers in windings, subjected to compression by electromagnetic forces from through-fault overcurrent
- Barrier cylinders in large transformers
- Moulded L-profile bars of pre-compressed board are used as structural members for the supporting of winding connections (“cleats and leads”)
- The material is also well suited for all types of former cylinders for windings.
- Laminated blocks (thicker than 8mm) are glued together from several sheets of board. They are used for winding press plates and for parts of cleats-and-leads structures and referred to as HDLC or HDLP.
- Pre-compressed board and laminated blocks replace natural wood and plywood where dimensional stability, strength against compression, and superior electrical insulation properties are wanted.

ELBOARD HD & HDLC			
Product	Units	HD	HDLC
International standard		IEC 641-1 Type B 3.1 Casein	IEC 641-1 Type LB 3.1 Casein
Thickness tolerance	%	5	4
Apparent density	g/cm ³	1.1 to 1.25	1.15 to 1.3
Min tensile Strength M.D. Unfolded	N/mm ²	105	85
Min tensile Strength C.M.D. Unfolded	N/mm ²	80	75
Min. elongation M.D. Unfolded	%	3	-
Min. elongation C.M.D. Unfolded	%	4	-
Max moisture content	%	6	8
Max ash content	%	1	-
Max conductivity of aqueous extract	m/Sm	3.5	15
pH of Aqueous extract		6.0 to 9.0	6.0 to 10.0
Max shrinkage M.D.	%	0.5	0.5
max shrinkage C.M.D.	%	0.7	0.7
Max thickness shrinkage	%	5	6
Min. oil absorption	%	9	6
Compressibility C	%	7.5	3.5
Resilience Crev	%	62	
Min breakdown voltage in oil	kV/mm	35	8
Test standard		IEC 641-2	IEC 763-2
test atmosphere		23/50	
Test material thickness	mm	3	