

# PUCARO DDP-Xtherm 140

## Extra thermally upgraded insulation paper



PUCARO DDP-Xtherm 140 presspaper is an optimal solution developed specifically for liquid-filled transformers used in wind and solar applications.

— PUCARO DDP-Xtherm 140

The new material is based on PUCARO Presspan, a multi-layer presspaper produced on multiple former cylinders in parallel and uses a diamond dotted pattern (DDP) a thermally activated coating on top of the paper to ensure strong bonding between conductors to make the winding mechanically strong in case of short-circuits.

Due to highest quality of selected cellulose fibers and optimal additive formulation, it was possible to increase the thermal rating without using any synthetics.

Depending on the design target, transformers could tolerate 10K to 20K higher hotspot temperatures or a longer lifetime compared to traditional designs.

The new material fulfills IEC 60641 electrical and mechanical requirements, enabling a smooth transition from existing insulating papers.

### Application area

- Wind farm and solar application transformers
- Distribution transformers with demanding requirements

### Features

- Thermal class up to 140°C in natural ester insulating liquid and 130°C thermal class in mineral oil according to IEEE C57.100
- Multi-layer material made of 100% cellulose fibers (presspaper according to IEC 60641)
- B-stage resin coating (DDP) with excellent bonding strength and long shelf life
- Oil compatibility with mineral and natural ester insulating liquid
- Thermal designs with 85K average winding temperature rise and 100K hotspot temperature rise according to IEEE C57.154-2012

### Benefits

- Reduced cost compared to synthetic materials with same thermal performance
- Overloadability of transformers
- Longer insulation system lifetime
- Better thermal stability
- Improved total cost of ownership
- Environmentally friendly
- Renewable material

### Form of delivery

- In rolls of maximum width of 1,340 mm
- Special dimensions and reels upon request

Material properties	Values				
Thickness of base paper (mm)	0.1	0.13	0.18	0.25	0.38
Density (g/cm <sup>3</sup> )	0.9 - 1.1				
Weight (g/m <sup>2</sup> )	105	135	185	255	385
Tensile strength MD (N/mm <sup>2</sup> )	90				
Tensile strength CMD (N/mm <sup>2</sup> )	40				
Elongation at break MD (%)	2				
Elongation at break CMD (%)	7				
pH of aqueous extract (pH)	7 - 9				
Conductivity of aqueous extract (mS/m)	8				
Ash content (%)	< 0.5				
Nitrogen content (%)	> 2				
Moisture content (%)	3 - 6				
Electric strength in air (kV/mm)	9				
Bonding shear strength (N/mm <sup>2</sup> )	0.5				

Measurements are done according to IEC 60641

Values represent typical values and are subject to modifications

**Legal notice:**

Although the above values have been determined by conscientious testing, they provide only general guidelines. ABB has implemented several programs to assure the highest quality and reliability of this product. Due to the wide range of applications, however, no responsibility can be assumed for its use.

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