

## INSULutions® DPE

### INTRODUCING INSULutions® DPE (DIAMOND PATTERN ENHANCED)

INSULutions® is a new family of WEIDMANN insulation products and services designed to address the needs of the transformer manufacturer and user. WEIDMANN INSULutions® offers advanced solutions in the analysis, design, optimization, and application of insulating systems for transformers.

INSULutions® DPE is a Diamond Printed Enhanced paper that exceeds the performance of traditional Kraft papers used for layer insulation in distribution transformers. It is a new generation diamond pattern printed, thermally upgraded paper that offers exceptional performance during converting and winding operations.

In addition, INSULutions® DPE has been specifically designed to accelerate and improve the insulation dry out rate exceeding the rate of traditional Kraft papers. The fibers used in INSULutions® DPE originate from 100% renewable sources, specifically selected for electrical papers. At WEIDMANN, these fibers undergo a unique preparation process that retains and enhances their inherently high mechanical and electrical strength.

When combined with an innovative High Voltage Insulation Design Methodology, INSULutions® DPE is an advancement in layer insulation technology for distribution transformers.

#### HIGH VOLTAGE INSULATION DESIGN METHODOLOGY

The High Voltage Insulation Design Methodology developed by WEIDMANN for use with INSULutions® DPE introduces design recommendations that result in:

- A reduction of HV insulation thickness (Hi-Lo barrier and HV layer insulation) and a coil radial build reduction
- Savings in the use of active materials, insulation materials, and construction materials
- A reduction in losses and an increase in transformer efficiency
- Thinner insulation additionally contributes to better dry out rate of a transformer coil

#### SUMMARY OF FEATURES

- 100% cellulose material
- Thermally upgraded
- Epoxy diamond patterned
- Enhanced electrical properties important for application
- Mechanically strong material
- Completely compatible with mineral oil and other transformer insulating liquids
- Special calipers available for optimum insulation design
- Exceptional performance in coil manufacturing and processing
- Increased dry out rate
- Supported with the new insulation design methodology

#### SUMMARY OF BENEFITS

- Reduced thickness of HV insulation (Hi-Lo and HV layer insulation)
- Reduced transformer coil radial build
- Reduced material weight
- Reduced active, insulation, and construction material cost
- Increased unit efficiency through reduced losses
- Optimized dry out cycle
- Factory test failure rate reduction through better control of insulation conditions

# WEIDMANN

## TYPICAL VALUES

Thickness	inch	0.003	0.005	0.006	0.008	0.010	0.012	Standard
	mm	0.076	0.127	0.152	0.203	0.254	0.305	
Basis Weight, Uncoated	lbs./ 3000 sq. ft	52	78	92	125	156	186	ASTM D202 ASTM D646
Density	g / cub. cm	0.9 – 1.1						ASTM D202
Moisture Content	%	3 – 5						ASTM D202 ASTM D644
Tear, MD	gram x force	75	130	155	210	300	330	ASTM D202
Tensile, MD	lbs. / inch	40	85	95	100	155	170	ASTM D202
Elongation, MD	%, min	1.5						ASTM D202
pH of hot aqueous extract	-	6 - 8						TAPPI T435 ASTM E70
Ash Content	%, max	0.75						ASTM D586
Nitrogen Content	%	1.3 – 2.6						ASTM D982
Bond Strength	PSI, min	40						WEIDMANN Quality Test
60 Hz AC Breakdown in Oil	kV / mm	73	68	64	58	56	54	ASTM D202 ASTM D149

All data shown in Table represents Typical Values only unless specifically stated differently.

### BONDING

The coated paper is designed to bond firmly and evenly to a conductor or other insulation, provided that there is an adequate time, temperature, and contact pressure.

### SHELF LIFE

When stored in a controlled environment, the “B stage” coated paper will have an extended shelf life. For paper stored in normal warehouse conditions, out of direct sunlight and away from direct moisture, we recommend that it be used within 12 months.

### PACKAGING

Coated paper is supplied in rolls or sheets. Rolls are wound on a 3-inch (76 mm) ID core and stretch wrapped in plastic that serves as a moisture barrier. Rolls can be packaged vertically or horizontally on pallets and banded. Each roll is labeled to the customer specification.

Rev. 1.23.14

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