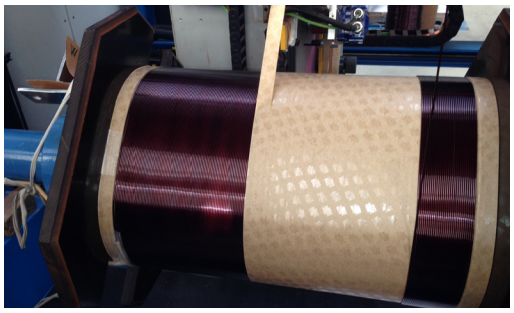
INSULutions® STRIP-Flex K

HIGH PERFORMANCE KRAFT PAPER FOR STRIP WINDING MACHINES

INSULutions® STRIP-Flex K is a thin diamond pattern coated layer insulation paper with 5-10 % MD elongation that provides superior performance for HV strip layer insulation in distribution transformers. Developed by Weidmann engineers specifically for use on modern HV strip winding machines, INSULutions® STRIP-Flex K gives distribution transformer manufacturers an unparalleled level of winding performance and the ability to run at high speeds and high tension, in order to maximize winding productivity.



FEATURES & BENEFITS

100 % sulphate wood pulp

Made from 100 % electrical grade (E-grade) unbleached sulphate (kraft) wood pulp. The designation electrical grade indicates a high level of purity. This raw material is defined within narrow, precise quality specifications. Use of E-grade pulp instead of inferior pulps results in superior reliability and long term performance while 'in service' conditions.

Thermally Upgraded (TU)

Thermally upgraded papers from Weidmann are chemically modified to reduce the rate at which the paper decomposes during thermal aging. The thermal upgrading chemicals neutralize the acids and absorb the water caused by thermal degradation of the cellulose, providing higher temperature capability and longer life. Thermally upgraded papers are 120 °C thermal class, as per IEC 60076-14 and IEEE Std C57.154. Compared to conventional 105 °C thermal class plain Kraft papers, Weidmann thermally upgraded papers offer the possibility to reduce transformer size and weight, and consequently reduce transformer cost due to increased thermal capability.

Epoxy Resin Diamond Dot Printed

These papers are offered with a B-stage epoxy resin diamond dot coating. Once cured during the normal factory dry-out process, the epoxy resin dots bond to the conductors and adjacent paper layers providing superior short circuit strength. The diamond dot pattern also provides excellent channels for water vapor escape during drying, and fluid ingress during the dielectric fluid filling and impregnation processes.

High elongation

New distribution transformer technology and design trends require papers with high elongation in the machine winding direction. This grade was specifically developed with high elongation to meet the demanding requirement of modern coil winding machines. The high elongation also enables a faster winding process in certain applications.

Excellent electrical properties

All Weidmann papers are made to provide excellent electrical properties. Using only the finest raw materials, together with specially designed fiber treatment production processes, Weidmann ensures the highest degree of purity and dielectric performance.

Conductive Path Tested

This paper is 100 % conductive path tested. During this test, all conductive paths are removed. Although all Weidmann papers are made from the very best materials, this additional step gives the highest possible assurance that no conductive particles will enter the transformer in the insulation.

Vision Inspection System

Establishing a new industry benchmark for quality of electrical insulating papers, Weidmann inspects 100 % of its electrical insulating papers using multiple state-of-the-art high resolution computer controlled camera systems operating in real time. Far exceeding the ability and reliability of industry standard inspection methods and unmatched by other manufacturers, Weidmann's sophisticated Vision Inspection System firmly establishes Weidmann electrical papers as the premier quality insulation material which will provide transformer OEMs and more importantly asset owners with decades of dependable / reliable service from transformers using Weidmann electrical papers.

SUGGESTED APPLICATIONS IN DISTRIBUTION TRANSFORMERS

LV Layer Insulation	
LV and HV End Fill Strips	
HV Full width layer insulation	
HV Two or three fold layer insulation	✓
HV Wide paper strip insulation	✓
HV Narrow strip insulation (HV strip winding machines)	✓

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TYPICAL VALUES (metric)

Base Paper Thickness *	inch	0.0018	0.0024	0.003	0.004	0.005	Standard
	mm	0.045	0.060	0.075	0.100	0.125	
Base Paper Thickness Tolerance *	%			± 10			
Epoxy Dot Thickness **	approx. µm			25			
Approximate Total Thickness ***	mm	0.070	0.085	0.10	0.125	0.15	
Grammage *	g/m^2	47	63	79	105	131	ASTM D202 (ASTM D646)
Density *	g/cm^3			0.95 - 1.15			Calculated
Moisture Content	%			4 - 7			ASTM D202 (ASTM D644)
pH of aqueous extract	pH			6 - 8			TAPPI T435 (ASTM E70)
Ash Content	%, max			1			ASTM D202 (ASTM D585)
Nitrogen Content	%			1.3 - 2.6			ASTM D982
Elongation - MD	%, min			5			ASTM D202
Tensile Strength - MD	kN/m	7	10	12	14	16	(ASTM D76)
Tensile Energy Absorption (T.E.A.)	J/m^2	0.4	0.5	0.8	0.9	1.0	
Bond/Sheer Strength ****	N/cm^2, min			28			Weidmann
Dielectric strength (oil)	kV/mm	75	73	72	69	67	ASTM D202 (ASTM D149)

All data shown in table represent typical values only unless specifically stated differently.

* Base Paper Thickness, Tolerance, Grammage, and Density given for uncoated base paper

** Epoxy Dot Thickness - approximate thickness of double-sided coating = total coating thickness on both sides

*** Approximate Total Thickness - of base paper plus double sided coating (epoxy dots on both sides)

**** Bond/Sheer Strength Test - Special Quality Test by Weidmann

Multi-ply paper machine

This designation indicates the paper has been manufactured on one of Weidmann's multi-ply paper machines, either a multi-ply Fourdrinier or a multi-ply cylinder machine. Multi-ply constructions provide a pinhole-free paper with enhanced mechanical and dielectric properties. All Weidmann paper machines employ widely recognized technology that has been optimized by Weidmann engineers specifically to produce electrical grade papers. State of the art process control systems ensure papers are produced to meet the needs of our customers. Specially designed fiber treatment processes guarantee highest degree of purity and strength.

Cylinder paper machine

Due to the particular design of the forming section, papers produced on the Cylinder paper machine are characterized by superior Machine Direction (MD) tensile and Cross-Machine Direction (CD) tear properties. These properties provide enhanced performance for wire wrapping, while still providing the required flexibility for coil winding applications. State of the art process control systems and fiber treatment processes ensure the highest levels of quality, purity and dielectric performance. Multi-ply cylinder machine design provides superior protection of pinhole-free paper.

Shelf life - epoxy coated products

When stored in a controlled environment, the "B stage" epoxy coated paper will have an extended shelf life. For paper stored in normal warehouse conditions, out of direct sunlight and away from direct moisture the paper can be kept for up to 12 months.

For more information please visit http://catalogue.weidmann-electrical.com and search for "E3DT000.RP".

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