

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

PAPER KRAFT, ELECTRICAL INSULATOR

ESF-M4E5-A

1. SCOPE

The material defined by this specification is a high grade Kraft insulating paper with high finish and of uniform quality. It shall also have the properties of unusual toughness and flexibility.

2. APPLICATION

This specification was released originally for material used as an insulator in the construction of starter motors, generators, and ignition coils

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A)

3.4 CONSTRUCTION

- | | | |
|-------|---------------|--|
| 3.4.1 | Fiber Content | 100 % Kraft fiber |
| 3.4.2 | Sizing | Shall be free of sizing material |
| 3.4.3 | Color | Any coloring
shall be made with
an aniline dye |
| 3.4.4 | Appearance | |

The finished paper shall be free from cracks, breaks or flaws of any kind. The surface must be clean and show uniform texture throughout and be capable of being coated with insulation varnishes and waxes.

3.4.5 Consistency

The paper shall be free from conducting particles and other foreign material as is consistent with manufacturing processes.

Date	Action	Revisions
2003 01 30	Revised	Para 3.0 inserted ; Para 3.1, 3.2, 3.3, 3.17, 3.18 4 deleted
1991 01 31	DE00E00107002086	Reactivated & Updated J.B. Huebner
1963 07 01	F6-1077	Released

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3.5	ASH CONTENT, max (TAPPI T 413)	1 %	
3.6	MOISTURE, max (ASTM D 644)	9 %	
3.7	pH (water extract) (ASTM D 202)	6.5-7.5	
3.8	CHLORIDES, max	35 ppm	
3.9	SULPHATES (TAPPI T 255)	No trace	
3.10	DENSITY, min (ASTM D 202)	0.75 g/cm ³	
3.11	BURSTING STRENGTH, min (ASTM D 774)	Conversion Table	
	mm	N	MPa
	0.13	222	0.34
	0.25	445	0.69
	0.38	667	1.00
	0.51	900	1.38
	-----	1112	1.72
3.12	BREAKING STRENGTH IN TENSION, min (ASTM D 828, based on 25 mm width, machine direction)	Conversion Table	
	mm	N	MPa
	0.13	222	0.34
	0.25	445	0.69
	0.38	667	1.00
	0.51	900	1.38
	-----	1112	1.72
On widths less than 13m , the breaking values for such widths shall be agreed upon by the purchaser and the supplier.			
3.13	ELONGATION, Lengthwise, avg (ASTM D 202)	2.5 %	
3.14	DIELECTRIC STRENGTH, min (ASTM D 202, short time)		
	Caliper	0.13-0.25 mm	6 kV/mm
	Above	0.25-0.51 mm	5 kV/mm