



MEDIUM PHENOLIC COATED SOFT KRAFT PAPER

1. GENERAL:

This specification governs the quality requirements of a soft, high absorbent and high air permeability insulating Kraft paper coated on one side with a phenolic (Cresolic resin). Base kraft paper shall conform to specification AA 211 11.

2. APPLICATION:

Used in the manufacture of resin bonded paper for electrical equipments.

3. COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian Standard covering this type of material.

4. DIMENSIONS AND TOLERANCES:

Width of the roll shall be as stated on the order. Standard widths are 1015, 1400, 1700, 2030, 2285 and 2540 mm with a tolerance of ± 5 mm. However any other width can also be ordered.

5. SHELF LIFE:

At 27°C - 12 months, Min.

The date of manufacture shall not be earlier than 15 days at the time of despatch.

6. TEST METHODS:

The tests shall be conducted in accordance with the methods indicated against relevant clauses.

7. SAMPLE FOR TEST:

20 sheets of size 300 x 300 mm of uncoated base paper and one square meter of coated paper in roll form shall be supplied for testing and approval.

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Revisions: Ref, Cl, 28, 3, 11 of MOM of MRC(E)			Approved: INTERPLANT MATERIAL RATIONALISATION COMMITTEE - MRC (E)		
Rev.No. 02	Amd.No.	Reaffirmed	Prepared BHOPAL	Issued CORP. R&D	Dt. of 1st Issue Mar, 80
Dt. 1-1-98	Dt.	Year:			

**8. BASE PAPER:**

Thickness of base paper shall be 75 um and shall conform to specification AA 21111 : Kraft insulating paper - High air permeability.

9. RESIN COATING:**9.1 Identification of Coating:**

The resin coating shall be phenolic (cresolic) when identified by Infra Red-Spectrophotometer or by any conventional method.

9.2 Compatibility:

The resin shall not adversely affect the electrical properties of the base paper and shall not react detrimentally with other phenolic adhesives and cements that may be employed in the assemblies where the end products of this paper find application.

10. COATED PAPER:**10.1 Weight of Coating:**

60 - 80% by wt. of the base paper.

Shall be determined by any conventional method.

10.2 Softening point of Resin Coating:

70 to 100°C.

Shall be tested by koeffler apparatus in accordance with Annexure-I.

10.3 Performance under Manufacture:**10.3.1 Winding Operation:**

When the coated paper is fed to the heating rollers at 165° - 170°C at a rate of 40 to 60 cm per minute for the manufacture of cylinders, the fluidity of the resin shall be satisfactory for a trouble free winging operation. The resin shall not polymerise too much so as to impede its flow during the above winding temperature.

10.3.2 Curing:

The cylinders shall cure hard and shall be machinable when stoved at 125 to 130°C for 12 hours.

**10.4 Type Test:**

Dissipation Factor at 50 Hz (AA 085 17 01):

0.01, Max.

Shall be tested on a laminate 1 mm thick, made under normal pressure of 1 M.Pa for 1 hour at $160 \pm 2^{\circ}\text{C}$, using a voltage stress of 1 KV at 50 Hz.

11. TEST CERTIFICATE:

Unless otherwise stated, three copies of test certificates shall be sent along with each consignment.

In addition, the supplier shall ensure to send one copy of test certificates along with the despatch documents to facilitate quick clearance of the material.

The test certificates shall bear the following information:

AA 21113: Medium Phenolic Coated Soft Kraft Paper.
(Rev.No.02)

BHEL Order No.

Batch No./Lot No. (Resin and Coated Paper)

Width of roll:

Net weight.

No. of rolls.

Test values obtained and certificate for compliance with clauses 4, 5 & 8 to 10.

12. PACKING AND MARKING:

The paper shall be supplied in rolls tightly wound on suitable hollow formers of 90 mm inside diameter. The outside diameter of the rolls shall not exceed 430 mm. The maximum weight of a roll shall be 215 kg. Ends of the rolls shall receive special attention to prevent damage. The packing shall be sea-worthy suitable for transit through tropics. The rolls shall be so packed and sealed as not to allow any ingress of moisture. Small silica-gel bags shall be placed inside.

The paper shall normally be supplied in one continuous length and in no case the number of lengths shall be more than two, the minimum length of any one being 185 metres. The end of one length shall be indicated by means of a suitable paper tag projecting from one end of the roll.

Each roll shall be marked with the following information:



AA 21113: Medium Phenolic Coated Soft Kraft Paper.
BHEL Order No.
Manufacturer's Name and Grade:
Width of roll.
Net Weight.
Date of Manufacture.

13. REFERRED STANDARDS (Latest Publications Including Amendments):

1. AA 211 11 2. AA 085 17 01

ANNEXURE-I

Procedure for determination of softening Point of Resin coating on Kraft paper by Koeffler's apparatus.

1. **General:**

The hot bench is an apparatus where temperatures from 50 to 250°C can be maintained from one end to other end with a constant temperature gradient.

2. **Procedure:**

- 2.1 Switch on the apparatus and allow it to attain a steady state. This normally takes 45 minutes.
- 2.2 Check the temperature calibration by placing substances of known melting point at various places along the length of the bench.
- 2.3 Cut a piece of resin treated paper about 15mm wide and 300 mm long i.e., equal to the length of bench & interpose it between 2 strips of kraft paper (having substance of 45 grm/m²). Place the assembly on the hot bench under a pressure of 6 kPa for 20 seconds. The pressure can conveniently be applied by means of a rubber lined metal sheet of approximately same size as the hot surface of the bench. If the weight of the strip is not sufficient to apply the pressure of 6 k Pa, additional weights as required may be placed. The resin treated side should point downwards. Remove the assembly and allow it to cool. Starting from the cold end lift the untreated paper and note the temperature where the resin of the treated paper starts sticking to the Kraft paper.
- 2.4 Take 5 readings and report the softening point of resin as average of these temperatures. About 15 minutes time should be given between each test to allow the hot bench to attain a steady state.