



TSD 6206 A

PLANT PURCHASING SPECIFICATION BHOPAL

BP 22 895

REV. NO. 03

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SUPERSEDES
BP 22895 Rev.02

POLYESTER RESIN IMPREGNATED FIBRE GLASS MAT SHEET MOULDINGS

1. GENERAL:

This specification governs the quality of fibre glass polyester moulding compound (Sheet Moulding Compound) consisting essentially of an unsaturated polyester resin system, combined with reinforcing glass fibres to form a resin mat which is soft and pliable at normal room temperature and cured as moulding under a pressure of 30 to 100 kg/cm² at temperature of 130 to 160 deg.C. The compound shall have moulding shrinkage of 0.2 to 0.4% & post shrinkage of moulding shall not be more than 0.05%. The mouldings are self extinguishing and have temperature index of at least 155.

2. APPLICATION:

Used for manufacture of various components of Tap Changer etc.

3. COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian or British Standard covering this type of material. However assistance has been drawn from Part 4 & 5 of BS 5734: 1990 "Sheet Moulding Compounds for electrical and other purposes.

4. COLOUR : Brown, unless otherwise specified on the order.

5. FINISH:

The moulded material shall be smooth, compact, bright and shall render mouldings free from cracks, blisters, gas pockets, foreign inclusions etc, and with uniformly distributed bond.

6. TEST METHODS:

Unless otherwise stated the tests shall be conducted in accordance with the relevant methods of BS: 7663-1993.

7. SAMPLE FOR TEST:

Two sheets each of 3mm thickness & one sheet each of 4 and 10 mm thickness in the size of 300x300 mm shall be supplied for testing & approval purpose

Revision : Reviewed & Brought up to date

Issued by :

Alhanda
STANDARDS AND MATERIALS GROUP
TECHNICAL SERVICES DEPARTMENT

Rev. No. 03

Date : 21.09.2007

Date of first issue : Dec.' 1986

8. PHYSICAL PROPERTIES:

- 8.1 Specific Gravity : 1.7 ± 0.1 .
- 8.2 Glass Content By Conventional Method : 25 to 35% by weight.
- 8.3 Water Absorption for 24 ± 1 hr : 50 mg, Max.
- 8.4 Fire Retardant Test (Annexure - I) : 30 Secs. Max.
- 8.5 Marten's Heat Distortion Temperature (DIN 53462) : 170 deg.C, Min.

9. MECHANICAL PROPERTIES:

- 9.1 Tensile Strength : 90 - 110 N/mm².
- 9.2 Cross Breaking Strength : 150 - 200 N/mm².
- 9.3 Impact Strength: (Charpy-flatwise)
- Un-notched: 10 - 12 J/Cm²
- Notched : 8 - 10 J/Cm²

10. ELECTRICAL PROPERTIES:

- 10.1 Electric Strength (Proof) in oil at 90 ± 2 deg.C : 12 kV/mm .
- 10.2 Surface Resistivity : $12 \log_{10}$ Ohm Min.
- 10.3 Comparative Tracking Index (IS 2824) : 900, Min.

11. SHELF LIFE (FOR COMPOUND ONLY):

Two months minimum under closed containers at 20 deg.C. However the supplier shall specify the shelf life and storage conditions and date of manufacture.

12. TEST CERTIFICATE:

Three copies of test certificates shall be supplied with each consignment, along with the following information.

In addition, the supplier shall ensure to enclose one copy of test certificate along with their dispatch documents to facilitate quick clearance off the material.



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The test certificate shall bear the following information :

BP 22895 : Polyester Resin Impregnated Fibre Glass Mat Sheet Mouldings.
Rev.03

Our Order No.

Batch/Lot No.

Test values obtained/certificate for compliance for Clause 4, 5 & 8 to 10.

13. PACKING AND MARKING:

Mouldings shall be packed in thick polyethylene bags and kept in suitable container.
Container shall be labelled with the following information.

BP 22895: Polyester Resin Impregnated Fibre Glass Mat Sheet Mouldings.

BHEL Order No.

Supplier's/Manufacturer's Name & Grade.

Date of Manufacture.

Batch No.

Net and Cross Weight.

ANNEXURE - I

TEST METHOD FOR FIRE RETARDANT TEST

1.0 Test Pieces:

Use five test pieces 10 to 15 mm wide, of thickness of the sheet under test. However if thickness of sheet exceeds 3 mm then thickness shall be reduced to 3 mm keeping one surface intact. Length of test piece shall be such that the exposed length is 80 mm or more as detailed in figure given below:-

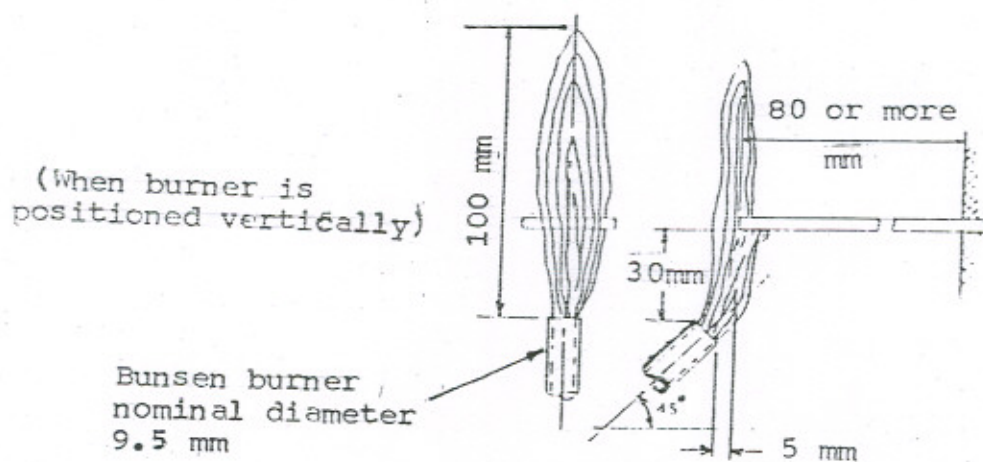


Figure 1. Assembly for burning time test

2.0 Conditioning:

Test the material in the as received condition.

3.0 Apparatus:

The following apparatus is required.

- 3.1 Draught free enclosure that permits observation. For safety and convenience it is desirable that this enclosure be fitted with a device, such as an exhaust fan to remove products of combustion that may be toxic. However, it is important that this device be turned off during the actual test.



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- 3.2 Bunsen burner of nominal diameter 9.5 mm and gas supply.

NOTE:

It has been found that for a wide range of materials the character of the flame, i.e, luminous or non-luminous, using common gases, does not affect the result obtained by this method of test.

- 3.3 Installation to fix the test piece and the Bunsen burner in the positions specified.

- 3.4 Stop Watch.

4.0 Procedure :

Clamp the test piece horizontally by one end so that the width dimension is in the horizontal plane. The Bunsen burner should be fixed at an angle of 45 deg. towards the unclamped end of the test piece so that it is 30 mm below the bottom edge and 5 mm away from the test piece (see figure).

Adjust the Bunsen-burner, with closed air-ports (see note to 3.2) to produce a flame approximately 100 mm long whilst in the vertical position. Whenever it is desired to ignite the test piece, the burner should be placed in the 45 deg. position described above it should not be moved during the test (see note below). After 60s turn the burner off. Check the burning time with the aid of the stop watch from the moment at which the flame is turned off.

NOTE:

No burning time can be assigned if, during the 60'signition period, the test piece distorts away from and out of reach of the flame.

5.0 Expression of Results :

For each of the five test pieces, record the time in seconds from the moment at which the Bunsen flame is turned off until the test piece ceases to burn provided some of the test piece remains unburned. Report the arithmetic mean of the results obtained on the five test pieces as

Burning time of test piece 10 mm to 15 mm wide :-----seconds.

Alternatively, report if any test piece has burnt away completely, or has distorted away from and out of reach of the flame.