

TIMBER

As per IS 1708-1969

| Test Required & Procedure | Frequency | Acceptance Criteria |
|---|---|---|
| 1 | 2 | 3 |
| <p>1. Moisture Content and Specific Gravity Test preparation and procedure:</p> | | |
| <p>a) Measurement and weight: Prior to each test, the dimensions of each test specimen shall be measured correct to 0.01 cm and the specimen shall be weighed correct to 0.001 gm.</p> <p>b) Control of moisture content: Before the preparation of the test specimens for testing in the seasoned condition, the material shall be brought practically to constant weight by storage under controlled conditions at $27^{\circ} \text{C} \pm 2^{\circ} \text{C}$ temperature and $65 \pm 5\%$ relative humidity. This is expected to bring the moisture content at 12% but if it is not exactly 12% it is permitted to test in the neighbourhood of 12% and results shall be adjusted to 12% moisture content. The test shall be made under such conditions that large changes in moisture content do not occur.</p> <p>c) Control of temperature: To avoid significant changes in strength properties all test specimen shall be tested within the temperature range of $27^{\circ} \pm 2^{\circ} \text{C}$. The temperature at the time of test shall be recorded.</p> | <p>For every Ten cum or part thereof.</p> | <p>The loss in weight expressed as a percentage of the oven dry weight shall be taken as the moisture content of the specimen. The formula for calculation shall be as given below:</p> <p>Percentage moisture content = $= \frac{WI - WO}{WO} \times 100$</p> <p>WI = Weight of sample at test in gms. WO = Oven dry wt. of sample in gms.</p> <p>Moisture content shall not exceed following values</p> <p>i) Timber for frames = 14%</p> <p>ii) Timber for planking shutters etc. = 12%</p> |

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d) Rate of loading: The rate of loading of the rest machine used shall not vary by more than + 20% from the specified speed for a given test. The load shall be applied continuously without interruption at the required speed throughout the test. The approximate percentage of sapwood if any, by volume, is estimated for all the test specimens and recorded. The number of the growth rings for 3 cm length shall be counted in the radial direction on each of the cross-section of such piece and the average shall be recorded as number of rings/cms for each specimen tested.

The drying shall be considered to be complete when the variation between last two weighing shall

Immediately after each mechanical test, disc approx. 2.5 cm in length and of full section as the test piece, shall be taken normally at the place of failure, failing which, at the central portion of the test specimen. In the case of shear test, the detached portion of the section approximately 5x5 cm shall be taken for determination of moisture content.

The sample shall be weighed and then dried in an oven at a temperature of 103 + 20 °C.

The weight shall be recorded at regular intervals.

WOODEN PANEL DOOR SHUTTERS

Conforming to IS 2202 (Part I) 1983

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1. Physical Test

Physical Verification-

- i) Name of the manufacturer or trade mark.
- ii) Thickness of door shutter.
- iii) Whether ISI Certification Mark exists.

One from each lot.

A specimen shall be considered to have passed the test if no de-lamination has occurred in the glue lines in the plywood and if no single de-lamination. More than 50 mm in length and more than 3 mm in depth has occurred in the assembly glue lines between the plywood faces and the stile and rail.

2. Glue Adhesion Test -

Procedure- Two square sections, 150 mm X 150 mm shall be cut from the corners of the door. These corner sections as cut from the door, shall be immersed in boiling water at 100° C for four hours, then dried at a temperature of 270° + 20° C and relative humidity of 65 ± 5% for 24 hours. At the end of the drying period the samples shall be examined for de-lamination. Glue lines in all the four exposed edges of the plywood on both faces of a specimen and the glue lines between the plywood faces and the stile and rail shall be examined for de-lamination.

READY MIXED PAINTS

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1. Drive Time

Procedure: The material shall be brushed or sprayed as required on a 150 x 150 mm mild steel panel prepared and allowed to air dry or stored under specified drying conditions.

The material shall be examined after specified intervals, for the following conditions:

- i) Surface dry
- ii) Hard dry

iii) **Tack free:** The procedure of test on the dried film of the panel after specified period as follows:

Place the panel in one pan of a suitable balance and counterpoise it with weights. Place a further weight of 2.25 kg and press on the dried film surface of the panel with the thumb till the two pans are balanced. Hold for one minute and then slowly release. No sign of stickiness to the thumb shall be apparent and the thumb impression, if produced, shall be such as can be wiped away with dry cotton wool.

On test each lot,
(All containers of same size and same batch of manufacture constitute a lot)

No sign of stickiness to the thumb shall be apparent.

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| <p>-</p> <p>2. Consistency-</p> <p>Procedure: Insert a clean metal rod or palette knife into the original container and examine the nature of the setting.</p> <p>3. Finish-</p> <p>Procedure: The material, when applied on an mild steel panel by brushing or spraying, which ever is specified to give a dry film weight commensurate with the weight per 10 litres of the material and allowed to dry in a vertical position under specified conditions, shall dry to hard, firmly adherent, flexible and smooth film, free from sagging and wrinkling with a matt, semi-glossy or glossy surface in accordance with the requirement of the material specification.</p> <p>4. Residue on Sieve-</p> <p>Outline: The material is mixed with a suitable solvent and passed through a 63 micron IS sieve. Not less than 20 gms. of the material taken from under the top skin shall be tested.</p> <p>Procedure: Accurately weigh the required quantity of the material and transfer to a 250 ml beaker</p> | <p>using either 20 ml of petroleum hydrocarbon solvent 145/205 (100 aromatic).</p> | <p>The material shall not be cake hard inside the container and shall be in such a condition that stirring easily produces a smooth uniform paint suitable for application.</p> <p>The film produced shall be of normal capacity and in no way inferior to a film prepared in the same manner and at the same time from the approved sample, when examined not earlier than 48 hours and not later than 100 hours after application. In case of failure, the test shall be repeated by keeping the painted panel under standard atmospheric condition.</p> |

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 (Conforming to IS: 1745-1961) or 20 ml of a mixture containing equal parts by volume of petroleum hydrocarbon solvent and benzene. Wet a 63 micron IS sieve on both sides with the solvent. Mix the material and the solvent in the beaker thoroughly, breaking up all lumps without grinding action, with the flattened end of a stirring rod. Transfer the contents of the beaker to the sieve using a wash bottle containing the solvent. Remove with the camel-hair brush any small particles of pigment that may be retained on the stirring rod or the walls of the beaker. Wash the residue left on the sieve with the solvent and gently brush with a camel-hair brush until the solvent passing through the sieve is clear and free from solid particles. When the washing is complete, dry the sieve for one hour at 100 + 2° C. Cool and transfer the residue with the help of the camel-hair brush to a weighed watch glass and determine the weight of residue.

5. Water Content

Outline of the method: The material is heated under reflux with an organic solvent which is immiscible with water. The carrier liquid distills into a graduated receiver carrying with it water which then separates to form the lower layer,

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the excess carrier liquid overflowing from the trap and returning to the still.

Procedure: Weigh 100 g. of the material in the flask, add 100 ml of dry petroleum hydrocarbon solvent (boiling point 75 to 85° C) and IMI of dry ethyacetate (conforming to IS:229-1964) or acetate (conforming to IS:231-1957) and thoroughly mix the contents of the flask. Pour petroleum hydrocarbon solvent into the receiver upto the level of the side tube. Attach the flask to Dean and stark condensing and collecting system and heat the flask at such a rate that the condensate falls from the end of the condenser at a rate of two to five drops per second. Continue the distillation unit condensed water is no longer visible in any part of the apparatus except at the bottom of the graduated tube and until the volume of water collected remains constant. Remove the persistent ring of condensed water in the rate of distillation by a few drops per second.

6. Weight per Litre

Outline of the method: The calibrated cylinder or CNP is filled with the material and weighed.

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Procedure: Weight the cylinder or cup when empty and then fill to the brim with the material Assuming that the volume of the contents is 50 ml or 100 ml, calculate and express as kg per 10 litres.

7. Lead Restriction

Outline of the method: Determination of lead in lead restricted paints is carried out by precipitating the lead as sulphide from the separated pigment, which is finally oxidized to lead monoxide.

Procedure: Shake about one gram of the ground pigment obtained, accurately weighed, continuously for one hour at room temperature with 1000 times its weight of an aqueous solution of hydrochloric acid containing 0.25 percent by weight of hydrogen chloride.

Allow the mixture to stand for one hour and then filter. Precipitate the lead salt contained in the clear filtrate as lead sulphide, filter, that the lead sulphide in air to convert it into lead sulphate, weigh calculate as lead monoxide (PbO) and express the result as percentage on the dry weight of the material taken for test.

PARTICLE BOARDS

| Test Required & Procedure | Frequency | Acceptance Criteria |
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| 1 | 2 | ----- |
| <p>Identification (Physical Verification)</p> <p>Each particle board shall be legibly marked near any of its edge with the following.</p> <ol style="list-style-type: none"> 1. Name of the manufacturer or trade mark. 2. Designation of particle board. 3. Thickness and date of manufacture. 4. Whether I.S.I. Certification marks exists. 5. Dimensional Tolerance <ol style="list-style-type: none"> a) Length \pm 8 mm b) Width \pm 8 mm c) Thickness <ol style="list-style-type: none"> i) Boards upto and including 25mm thick \pm 5.0%] ii) Boards above 25mm thick \pm 2.5%. <p>Edges of the board shall be straight with a tolerance of 3 mm. the persistent ring of condensed water in the rate of distillation by a few drops per second.</p> | <p>One from each lot</p> | <p>shall not vary from the mean density by more than + 10%.</p> <p>Moisture content : The average value of the moisture content shall be between 7 to 16%.</p> <p>Water absorption : The value of water absorption shall not exceed 25% for two hrs, soaking and 50% for 20 hrs. soaking.</p> <p>Exterior grade (I) : These particle boards shall not delaminate after 3 hrs. boiling in water at 100'C.</p> <p>Interior Grade (Gr.II) : These particle boards shall not disintegrate and / or shall not detaminate after 24 hrs. immersion in water at 27% \pm 2'C.</p> <p>Swelling water : Swelling in thickness in % of original thickness for 2 hrs. immersion shall be determined and the same shall not be more than 5%. The Swelling in thickness due to surface absorption in two hours shall not be more than 5%.</p> |
| | <p>Density – The density of each sample</p> | |

LIST OF APPROVED BRANDS / MAKES

One of the following make of the material shall be used. The contractor will have to get the sample approved from the Architect/ Bank's Engineer whose decision shall be binding on the contractor. The condition is also applicable for any material, not mentioned in the specification or schedule of work. No deviations are allowed in these even during/ after Tender.

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| 1 | Vitrified Tiles | Kajaria/ Somany/ H.R.Johnson/ NITCO/ Orient Bell |
| 2 | Ceramic wall Tiles | Kajaria/ Somany/ H.R.Johnson/ NITCO/ Orient Bell |
| 3 | Ceramic floor Tiles (antiskid) | Kajaria/ Somany/ H.R.Johnson/ NITCO/ Orient Bell |
| 4 | False Flooring | Unifloor/ Flexi Access Floor/ Armstrong |
| 5 | Wooden Laminated Flooring | Pergo/ Armstrong/ Vista |
| 6 | Aluminum Fittings | Jindal/ Hindalco/ MAAN |
| 7 | Aluminum Extrusion Sections | Jindal/ Hindalco/ MAAN |
| 8 | Commercial Plywood | Century/ Green/ Archid |
| 9 | Laminates (1.00 mm thk.) | Greenlam/ Century/ Sunmica Aica/ Archid |
| 10 | Veneer | Century/ Archid/ Green/ Durian |
| 11 | Drawer Sliding/ SS Fittings/ Handles/ Locks | Earl Bihari (EBCO)/ Godrej/ Hettich/ Dorma/ Ozone |
| 12 | Floor Spring/ Door Closer | Dorma/ Haffele/ Ozone/ Geze |
| 13 | Triple Computer Monitor Mount/ Stand Arm | Vivo/ Dell/ HP |
| 14 | Flush Door | Century/ Archid/ Green |
| 15 | Texture Interior Paint | Dulux/ Berger/ Okios/ Asian |
| 16 | Readymade Computer Drawer | EBCO/ Hettich/ Blum/ Haffele |
| 17 | Paints | Asian/ Nerolac/ Berger/ Dulux/ ICI |
| a) | Cement paint | Snowcem/ Surfaced/ Durocem |
| b) | Synthetic Enamel Paint | Asian/ Nerolac/ Berger/ Dulux/ ICI |
| c) | Acrylic Emulsion Paint (Interior and Exterior) | Asian/ Nerolac/ Berger/ Dulux/ ICI |
| 18 | Glazing | Modi Tuff Glass/ Triveni Glass Ltd./ Indo Asahi Glass Co. Ltd./ Saint Gobain |
| 19 | Cement | Grade 43/53 of L&T/ A.C.C./ Ambuja/ Ultratech |
| 20 | Mineral Fibre False Ceiling | Armstrong/ Indian Gypsum Board/ Gyproc |
| 21 | ACP Panels/ Sheets | Alubond/ ALU Decor/ Alstrong/ Alstone |
| 22 | Acrylic Sheets | Sanmati Acrylics/Acrylic Sheet India/ Acry Plus |

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| 23 | Vertical/ Roller blinds | Vista/ MAC/ Hunter Douglas |
| 24 | Corian | Corian/ LG/ Luxar Durlax |
| 25 | PU Paint | Asian/ Berger/ ICI |
| 26 | Wall Paper | Elemento/ Marshel |
| 27 | MDF | Green Panel/ Century/ Action Tesa |
| 28 | Lacquered Glass | Modiguard/ Saint Gobain/ Asahi Glass |