



PRODUCT MANUAL FOR PLYWOOD FOR CONCRETE SHUTTERING WORKS ACCORDING TO IS 4990 : 2011

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	Product	:	IS 4990 : 2011
	Title	:	PLYWOOD FOR CONCRETE SHUTTERING WORKS
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	Adhesive – IS 848
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Plywood – 1 sheet
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day :		
	a) Dimensions and Tolerance (Clause 7) b) Workmanship and finish (Clause 8)		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 4990 : 2011 with the following scope:		
	Name of the product	PLYWOOD FOR CONCRETE SHUTTERING WORKS	
	Type	Type 1 (CS) /Type 2 (CSC) /Type 3 (CSFF)	
	Size	Upto and including _____ ply and _____ thickness.	

ANNEX A

Grouping Guidelines

1. Plywood for concrete shuttering works are classified based on the parameters as given below:
 - a) Grade: BWP
 - b) Type

<i>Type</i>	<i>Description</i>	<i>Designation</i>
Type 1	Plywood for concrete shuttering work (Plain)	CS
Type 2	Plywood for concrete shuttering work with plastic coating (Coated)	CSC
Type 3	Plywood for concrete shuttering work with suitable overlay (Film Faced)	CSFF

- c) Number of ply : 3, 5, 7, 9 and more than 9
 - d) Thickness based on number of ply: 4 mm to 40 mm
 - e) Any dimensions i.e. length, width and thickness as agreed to between the manufacturer and the purchaser are also permitted in addition to the standard dimensions.
2. Considering the above, following grouping guidelines for GoL/CSoL have been developed:
 - a) One sample with highest ply, highest thickness and any size for each type shall be tested for all requirements to cover Plywood of that type tested and with number of ply and thickness upto and including the tested sample.
3. The Firm shall declare the varieties of Plywood intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.
4. During the operation of the Licence, BO shall ensure that all the Varieties covered in the Licence are tested in rotation to the extent possible.

ANNEX B
List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Veneers thickness (Clause 6.2 and 6.3)	Measuring Tape
		Steel Scale
	Dimensions and tolerance (Clause 7)	Micro Meter
		Vernier Caliper
		Squareness Gauge
	Workmanship and finish (Clause 8)	Straight Edge
		Feeler Gauge
2	Moisture content (Clause 10.1.1)	Hot Air Oven - thermostat controlled and fitted with thermometer
		Moisture Meter
3	Glue shear strength (Clause 10.1.2.1 , 10.1.3.1.1, 10.1.5.1)	Humidity and temperature controlled cabinet
		Tensile testing machine
4	Adhesion of plies (Clause 10.1.2.2, 10.1.3.1.2 and 10.1.5.2)	Knife as per fig 1 of IS 1734 (Part 5)
		Stout table
5	Resistance to water test (Clause 10.1.3)	Water Bath fitted with digital temperature controller
		Knife as per ISS
		Stout Table
6	Mycological test (Clause 10.1.5)	Enameled Mycological Tray with Sucrose / Saw Dust
7	Plywood with plastic coating or overlay (Clause 10.1.4)	Water bath
8	Tensile strength (Clause 10.1.6)	Humidity and temperature controlled cabinet
		Tensile testing machine

9	Static bending Strength (MoE and MoR Test) (Clause 10.1.7) Wet bending Strength (Clause 10.1.8)	Tensile Testing Machine attached with MoE and MoR attachments and 100 mm. dial gauge
10	Retention of preservative (Clause 10.1.9)	Mortar with pestle Hot plate Muffle furnace Various glassware Chemical as per IS 2753 (Part 1)
11	Adhesive testing, Clause 5.2	pH Meter IS Sieve Water bath
12	General test equipments	Humidity Chamber with thermometer & hygrometer Desiccator Air Conditioner Dry-Wet Thermometer Electric Hot Plate Chemicals and glassware Test sieves Glass sheet Hydrometer Distilled water Viscosity Cup

The above list is indicative only and may not be treated as exhaustive.

ANNEX C

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING – As per the requirements of IS 4990: 2011

4. CONTROL UNIT – All plywood boards of similar construction and type pressed under similar conditions continuously in one press with same mix of adhesive in a day shall constitute a control unit (Plywood Boards in which the arrangement of veneers is similar as regards thickness and species of timber on both sides of central ply shall be considered to be of similar construction).

5. LEVELS OF CONTROL - The tests as indicated in column 1 of [Table 1](#) and the levels of control in column 3 of [Table 1](#), shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

6. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
5.1	Timber	5.1	IS 4990	-	One	Each lot received	Record of each lot of timber received shall be maintained
5.2	Adhesive	5.2	IS 4990 IS 848	R	One	Each lot	No testing is required, if accompanied with test certificate or ISI marked.
6	Manufacture	6.1 to 6.3	IS 4990	R	One	Each consignment	Moisture content of two samples of dried veneers shall be tested at discharge end of each drier every hour and record of same shall be maintained.
		6.4 to 6.7	IS 4990	R	One	Each control unit	
7	Dimensions and tolerances	7.1 to 7.4	IS 4990	R	Five	For each size from each control unit	Samples shall be drawn at regular interval to cover entire production. In case of failure of any sample, entire production shall be checked and only conforming product shall be marked.
8	Workmanship and finish	8.1 to 8.3	IS 4990	R	Each board	-	-
10.1.1	Moisture content	10.1.1	IS 4990 IS 1734 (Part 1)	R	Two	Each control unit	In case of failure, control unit shall be suitably reconditioned and re-tested. The control unit shall be accepted if retested sample passes the test.
10.1.2	Glue adhesion in dry state	10.1.2.1 10.1.2.2	IS 4990 IS 1734 (Part 4) IS 1734 (Part 5)	R	One	Each control unit	In case of failure of sample, twice the number of samples from same control unit shall

10.1.3	Resistance to water test	10.1.3 10.1.3.1 10.1.3.1.1 10.1.3.1.2	IS 4990 IS 1734 (Part 4) IS 1734 (Part 5)	R	One	Each control unit	be tested and control unit shall be accepted if retested sample found passing.
10.1.5	Mycological test	10.1.5 10.1.5.1 10.5.1.2	IS 4990 IS 1734 (Part 7) IS 1734 (Part 4) IS 1734 (Part 5)	R	One sample in a month from each set of species of timber and each grade of plywood		#
10.1.4	Plywood with Plastic coating or overlay	10.1.4	IS 4990	R	One	Each control unit	In case of failure of sample, additional sample from same control unit shall be tested and control unit shall be accepted if retested sample passes the test
10.1.6	Tensile strength	10.1.6	IS 4990 IS 1734 (Part 9)	R	One	Each control unit	In case of failure of sample, twice the number of samples from same control unit shall be tested and control unit shall be accepted if retested sample found passing.
10.1.7	Static bending strength	10.1.7	IS 4990 IS 1734 (Part 11)	R	One	Each control unit	
10.1.8	Wet Bending strength	10.1.8	IS 4990 IS 1734 (Part 11)	R	One	Each control unit	
10.1.9	Retention of preservative	10.1.9	IS 4990 IS 2753 (Part 1) IS 5539	R	One	Each control unit	

Samples may be drawn in such a manner that all thickness of plywood manufactured are tested over a period of time. In case of failure of sample in mycological test, a thorough check shall be made about the type of glue used and type of preservative added to the glue.

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.