



उत्पाद मैनुअल

कंक्रीट शटरिंग कार्य के लिए प्लाईवुड,

आईएस ४९९० : २०२४ के अनुसार

PRODUCT MANUAL
PLYWOOD FOR CONCRETE SHUTTERING WORKS,
ACCORDING TO IS 4990: 2024

यह उत्पाद नियमावली सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसधारियों द्वारा विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना-I के अंतर्गत प्रमाणन के संचालन में एकरूपता और पारदर्शिता सुनिश्चित करने के लिए संदर्भ सामग्री के रूप में उपयोग की जाएगी। बीआईएस प्रमाणन प्राप्त करने के इच्छुक भावी आवेदक भी इस दस्तावेज़ का उपयोग कर सकते हैं।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या / IS No.	:	IS 4990: 2024
	शीर्षक / Title	:	Plywood for Concrete Shuttering Works
	संशोधनों की संख्या No. of amendments	:	1
2.	नमूनाकरण दिशानिर्देश / Sampling Guidelines		
a)	कच्चा माल Raw material	:	The adhesives used for bonding the veneers shall be based on any suitable synthetic resin conforming to BWP grade of IS 848. <i>Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer ANNEX – A
c)	नमूने का परिमाण Sample Quantity	:	Plywood – 1 sheet <i>Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (incase of market surveillance, effort may be made to procure therequired quantity of product sample, as far as possible since raw material sample may not be available in market)</i>

d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request		Same as the scope of licence. <i>Note: Apart from the above, any other requirements/ parameters may also be declared as per the standard, as applicable.</i>
3.	परीक्षण उपकरण की सूची List of Test Equipment	:	Please refer ANNEX – B
4.	निरीक्षण एवं परीक्षण योजना Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	(i) Manufacture (Clause 6), (ii) Dimensions (Clause 7), (iii) Workmanship and Finish (Clause 8), (iv) Glue adhesion in Dry state (Clause 10.4.1) <i>Note: This section is for the guidance of BIS Certification Officers/ Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/ auditor.</i>
6.	लाइसेंस का दायरा /Scope of the Licence:		
“License is granted to use Standard Mark as per IS 4990 : 2024 with the following scope:			
Name of the product		Plywood for Concrete Shuttering Works	
Type		CS/ CSC/ CSFF	
Categories		With Preservative treatment / With glue line protection (GLP) (as applicable)	
Thickness (mm)		Upto and including _____ (mm)	
Formaldehyde Class		E1/ E2	
Steady-State Formaldehyde Emission test (optional test) (Cl 10.13)		With/ without	

भारतीय मानक ब्यूरो
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ANNEX -A
Grouping Guidelines

1. Plywood for Concrete Shuttering Works as per IS 4990 : 2024 is classified as below:
 - a) Type :
 - a. Plywood for concrete shuttering work (Plain) - CS,
 - b. Plywood for concrete shuttering work with polymer coating (Coated) - CSC,
 - c. Plywood for concrete shuttering work with suitable overlay (Film Faced) - CSFF.
 - b) Categories : With Preservative treatment / With glue line protection (GLP) (as applicable)
 - c) Thickness (mm)
 - d) Formaldehyde Class : E1 / E2
 - e) Steady-State Formaldehyde Emission test (optional test) (Cl 10.13) : with/ without
2. Considering the above, each type for each formaldehyde class shall be tested at the maximum thickness to cover that particular type and formaldehyde class for all thicknesses up to and including the thickness tested.
3. If a particular variety is tested with preservative treatment, that variety, both with preservative treatment and with GLP, shall be considered covered.
4. Each variety with Steady-State Formaldehyde Emission test shall be tested to cover the Steady-State Formaldehyde Emission test requirement for that particular variety.
5. The Firm shall declare the varieties of Plywood they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
6. The manufacturer shall declare the following:
 - Formaldehyde Class,
 - Type of Synthetic resin,
 - Dimensions (length, width and thickness) and number of ply,
 - Opting for optional requirement- Steady-State Formaldehyde Emission test (Clause 10.13)
 - Service life as per Clause 10.11
 - Preservative chemical used
7. 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 Equipments**
(Indicative List, For Guidance Only)

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Adhesive (Clause 5.2)	Moisture Meter Hydrometer Thermometer IS Sieve Electronic Balance pH Meter, Enamelled Tray
2.	Dimensions (Clause 7)	Measuring Tape Steel Scale Micrometer Squareness Straight Edge Feeler Gauge
3.	Moisture content (Clause 10.3)	Hot Air Oven with fan & Temperature control Electronic Balance
4.	Glue Shear strength (Clause 10.4.1)	Saw Cutter Vernier caliper Tensile testing machine
5.	Adhesion of plies (Clause 10.4.2)	Knife as per IS 1734 (Part 5) Stout Table
6.	Resistance to water test (Clause 10.5)	Saw Cutter Vernier caliper Tensile testing machine Knife as per IS 1734 (Part 5) Stout Table Water Bath with temp control & pump
7.	Mycological Test (Clause 10.7)	Enameled Tray with Glass Sheet Fungus with spores Saw dust Arrangement to maintain temp at 27+/-2 deg C. Weighing balance Sucrose/ commercial malt extract
8.	Tensile strength, Static Bending strength and Wet Bending Strength (Clause 10.8, 10.9 and 10.10)	Tensile Testing Machine with load display, Sample cutter Attachment for MOR and MOE tests in tensile machine
9.	Retention of Preservative (Clause 10.11) (IS 2753 Part 1)	Mortar with pestle Hot plate Muffle furnace Various glassware Chemical as per IS 2753 (Part 1)

10.	Formaldehyde content test (perforator method) (Clause 10.12)	Toluene, Iodine standard solution, Sulphuric acid, Sodium thiosulphate Sodium hydroxide Starch Acetylacetone Ammonium Acetate Weighing balance Drying oven Extraction Apparatus as per fig.1 of IS 13745
11.	General laboratory equipments	Humidity Chamber with thermometer & hygrometer Desiccator Air Conditioner Dry-Wet Thermometer Electric Hot Plate Chemicals and glassware Viscosity Cup

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

ANNEX C

Scheme of Inspection and Testing

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or sub-contracting/ sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 Recommended Levels of Control/ Control Unit:

- 1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: *All plywood boards of similar construction and type pressed under similar conditions on the same day in one press from same mix of adhesives shall constitute a control unit (Boards in which the arrangement of veneers is similar as regards thickness and species of timber for face plies shall be considered to be of similar construction)*
- 1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.
- 1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING

The manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/ empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 Test Records- The manufacturers shall maintain test records for the tests carried out (either in-house or at

a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING

The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each plywood sheet provided always that the material so marked conforms to all requirements of the specification.

3.1 Marking on each plywood shall be done as per Cl. 12 of IS 4990: 2024

3.2 **Additional Marking requirements:** Each plywood shall also be marked with the following additional requirement on each packing:

a) “For BIS certification details please visit www.bis.gov.in”

4. REJECTION

The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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*(Recommended Levels of Control by BIS- for Guidance Only)*

(1)				(3)		
Test Details				Levels of Control		
Cl.	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
5.	MATERIALS					
5.2	Adhesive	5.2	IS 4990 IS 848	One	Each lot manufactured/ received	Each lot manufactured/ received
6.	Manufacture	6.	IS 4990	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
6 & 10.3	Moisture Content	6 & 10.3	IS 4990			
7	Dimensions & Tolerances	7	IS 4990			
8	Workmanship and Finish	8	IS 4990			
10.4	Glue adhesion in dry state	10.4	IS 4990 IS 1734 (Part 4 & 5)	One	Each control unit	
10.5	Resistance to water test	10.5	IS 4990	One	Each control unit	
10.6	Plywood with Plastic coating or overlay	10.6	IS 4990	One	Each control unit	
10.7	Mycological test	10.7	IS 4990	One sample in a month from each set of species of timber		
10.8	Tensile strength	10.8	IS 4990	One	Each control unit	
10.9	Static Bending Strength	10.9	IS 4990	One	Each control unit	
10.10	Wet Bending Strength	10.10	IS 4990	One	Each control unit	
10.11	Retention of preservative	10.11	IS 4990 IS 2753 (Part 1)	One	Each control unit	
10.12	Formaldehyde content test	10.12	IS 4990 IS 13745	One	Once in a month	Each Formaldehyde Class produced during the period shall be tested
10.13	Steady-state Formaldehyde emission test (optional test)	10.13	IS 4990 IS/ISO 12460-1	One	Once in a year	