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उत्पाद मैन्युअल
शिरोपरी पावर और दूर संचार लाइनों के लिए पूर्व प्रतिबलित कंक्रीट के खम्बे के लिए आई एस 1678:1998 के अनुसार

PRODUCT MANUAL FOR PRESTRESSED CONCRETE POLES FOR OVERHEAD POWER TRACTION AND TELECOMMUNICATION LINES ACCORDING TO IS 1678:1998

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

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 1678:1998
	शीर्षक **Title**	:	Prestressed Concrete Poles For Overhead Power Traction and Telecommunication Lines
	संशोधनों की संख्या **No. of amendments**	:	Nil
2.	नमूना दिशानिर्देश **Sampling Guidelines**		
a)	कच्चा माल **Raw material**	:	Please refer to Annex-A 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
b)	समूहीकरण दिशानिर्देश **Grouping Guidelines**	:	Please refer to Annex-B
c)	नमूने का परिमाण **Sample Quantity**	:	2 Poles 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)
d)	Process & Operation of Licence		Considering the nature of product, licence is to be granted and operated based on complete factory testing basis. Manufacturer shall have complete test facilities to test the product as per Standard.
3.	**परीक्षण उपकरणों की सूची List of Test Equipment**	:	Please refer to Annex-C
4.	**निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing**	:	Please refer to Annex-D
5.	**एक दिन में संभावित परीक्षण Possible tests in a day**		
	As the licence is operated on Factory Testing basis, complete testing of a sample shall be done in factory. 2 mandays are required for complete testing of the product as per IS 1678 : 1998. 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 readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 1678 : 1998 with the following scope:		
	Name of the product	Prestressed Concrete Poles For Overhead Power Traction and Telecommunication Lines	
	Overall Length		
	Design Ultimate Transverse Load		

ANNEX A
Raw Material

Raw Material	Indian Standard
Cement (Cl 5.1)	Cement used for the manufacture of prestressed concrete poles shall be ISI marked conforming to the relevant Indian Standard as mentioned in Clause 5.1 of IS 1678.
Aggregates (Cl 5.2)	Aggregates used for the manufacture of reinforced concrete poles shall conform to IS 383. If source and/or size and types of coarse and fine aggregate has changed, it shall be treated as additional raw material.
Prestressing Steel (Cl 5.3)	Prestressing steel shall conforms to the relevant Indian Standard as mentioned in Clause 5.3 of IS 1678. If different type and/or sizes of steel are used, it shall be treated as additional raw material.
Reinforcement (Cl 5.4)	Reinforcing bars and wires shall conforms to the relevant Indian Standard as mentioned in Clause 5.4 of IS 1678. If different type and/or sizes of steel for reinforcement are used, it shall be treated as additional raw material.
Concrete (Cl 5.5)	The grade of concrete shall be not less than M 40.
Admixture (Cl 5.6)	Admixture shall conform to IS 9103.

ANNEX-B

Grouping Guidelines

1. Prestressed Concrete Poles for Overhead Power Traction and Telecommunication Lines as per IS 1678:1998 are categorized as given below:

i) Overall Length : 6 m and subsequent length shall be in steps of 0.5 m.
ii) Design Ultimate Transverse Load

2. Considering the above, the following grouping guidelines for GoL/CSoL have been developed:

- Pole with highest Overall Length from each Design Ultimate Transverse Load shall be tested to include poles of all Overall Length upto the length tested for that particular Design Ultimate Transverse Load in the licence scope.

3. Manufacturer has to declare the Design Ultimate Transverse Load for each overall length of pole.

4. The Firm shall declare the varieties of Prestressed Concrete Poles for Overhead Power Traction and Telecommunication Lines intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

5. During the operation of the Licence, BO shall ensure that all mounting heights covered in the Licence are tested in rotation, to the extent possible.

6. Concrete cubes shall be cast in the factory during surveillance visits and the quality of concrete used in manufacturing of poles shall be assessed through independent testing. Details of mix design may also be obtained from the firm.

ANNEX-C

List of Test Equipment

(INDICATIVE LIST, FOR GUIDANCE ONLY)

S. No.	Tests used in with Clause Reference	Test Equipment
1.	Tolerances – overall length, cross sectional dimensions, uprightness, manufacture & design requirements (Clause 4)	a) Vernier calliper b) Micrometre c) Measuring tape
2.	Compression Test on Concrete cubes (Clause 5.5)	a) Compressive Strength Test Machine fitted with Load Gauge b) Cube Moulds c) Tamping rod/ vibrator for compaction d) Humidity chamber e) Hygrometer f) Curing tank inside lab g) Air Conditioner
3.	Transverse Strength Test for Poles (Clause 8.2)	a) Testing arrangement as per fig 1 of IS 2905:1989 b) Dry & wet bulb thermometer / hygrometer

ANNEX D

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 1678:1998.

4. CONTROL UNIT – Concrete poles of the same overall length and Design Ultimate Transverse Load manufactured from the same batch of material under similar condition of production in a day shall constitute a control unit.

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

(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				**Test equipment requirement** R: required (or) S: Sub-contracting permitted	**Recommended Levels of Control**		
Clause	**Requirement**	**Test Methods Clause Reference**			**No. of Sample**	**Frequency**	**Remarks**
5.1	Cement	5.1	IS 1678	S	-	Each consignment	Shall be ISI marked and received with test certificate
5.2	Aggregates	5.2	IS 1678 IS 383	S	One	Each consignment	No further testing is required if ISI marked or accompanied with test certificate.
5.3	Prestressing steel	5.3	IS 1678	S	-	Each consignment	Reinforcement material received shall be ISI marked and accompanied with test certificate.
5.4	Reinforcement	4.3	IS 1678	S			
5.5	Compression Test on Concrete cubes	5.5	IS 1678 IS 456	R	One consisting of 3 cubes from each consignment of cement	Supply of cement executed against order spread over up to three months shall be taken as one consignment for this test only.	
5.6	Admixtures	4.5	IS 1678	S	One	Each consignment	No further testing is required if accompanied with test certificate or ISI marked.
6	Design	6	IS 1678	R	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		
7	Manufacture	7	IS 1678	R			

8.1	Daily tests on concrete	7.9	IS 1678	R	Three	Each control unit	During manufacture, daily tests on concrete cubes shall be carried out till the concrete achieves the required strength at transfer. Thereafter the test on concrete shall be carried out as detailed in IS 1343.
8.2	Transverse Strength Test for Poles	8.2	IS 1678	R	One	Each control unit	In case of failure of pole in any of the requirement, two more poles from same control unit shall be tested for that requirement and control unit shall be rejected if there is any failure.