

PRODUCT MANUAL FOR ALUMINIUM CONDUCTORS FOR OVERHEAD TRANSMISSION PURPOSES

PART 1- ALUMINIUM STRANDED CONDUCTORS ACCORDING TO IS 398 (Part 1):1996

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 398 (Part 1):1996
	Title	:	Aluminium Conductors for Overhead Transmission Purposes - Part 1- Aluminium Stranded Conductors
	No. of Amendments	:	1
2.	Sampling Guidelines:		
a)	Raw material	:	EC grade Aluminium rod IS 5484
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Stranded Conductor – 5 m Aluminium Wires before Stranding – 5 m
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 :	:	All tests specified in IS 398 (Part 1): 1996
6.	Scope of the Licence :		
	<p>“Licence is granted to use Standard Mark as per IS 398 (Part 1):1996 with the following scope: “Aluminium Stranded Conductors for overhead transmission purposes, for sizes upto and including _____mm² (Nominal Aluminium Area).”</p>		

ANNEX A

Grouping Guidelines

1. IS 398 (Part 1): 1996 covers Aluminium Stranded Conductors used for Overhead Transmission purposes, with nominal Aluminium Area up to and including 300 mm².
2. For considering GoL/CSoL, conductor of any size (Nominal Aluminium Area), preferably the largest intended to be covered in the licence may be drawn for testing, to cover all the sizes.
3. The firm shall declare the size of conductors they intend to cover in the licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities 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.	Test Equipment	Tests used in with Clause Reference	
		Cl. Ref.	Tests
1	Micrometer	12.2, 13.1(a)	Measurement of Diameter
2	Vernier Calipers	12.3, 13.1(b)	Breaking Load Test
3	Steel Scale		
4	Tensile Testing machine		
5	Mandrels	12.4, 13.1(c)	Wrapping Test
6	Micro-Ohm Meter	12.5, 13.1(d)	Resistance Test
7	Thermometer		

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 398 (Part 1):1996.

4. CONTROL UNIT – Every production length of Stranded conductor 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

(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				
Aluminium Wires before Stranding							
6	Freedom from defects	6	IS 398 (Part 1)	-	-	Each bobbin of Aluminium wire drawn/ received	If any sample fails in respect of any requirement, two more samples from the same bobbin shall be tested for that requirement and if there is any further failure in retesting the bobbin shall be rejected.
7.1	Diameter	12.2		R	One		
8.1	Joints in wires	8.1		-			
9.1	Stranding	9.1		R			
12.3, 13.1(b)	Breaking load	12.3		R			
12.4, 13.1(c)	Wrapping test	12.4		R			
12.5, 13.1(d)	Resistance	12.5		R			
Stranded Conductors							
7.2.1	Size		IS 398 (Part 1)	R	One	Each control unit	If any sample fails in respect of any requirement, two more samples from the same control unit shall be tested for that requirement and if there is any further failure in retesting the control unit shall be rejected
7.2.2	Resistance	12.5		R			
8.2	Joints in stranded conductors	8.2		-	Entire Conductor length		
9.2, 9.3, 9.4, 13.1(e)	Lay Ratio	12.6		R	One	Each control unit	
12.3, 13.1(b)	Breaking load	12.3		R			

Note-1: 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.