

**SCHEME OF TESTING AND INSPECTION  
FOR CERTIFICATION OF  
CROSSLINKED POLYETHYLENE INSULATED THERMOPLASTIC  
SHEATHED CABLES FOR WORKING VOLTAGES UPTO AND INCLUDING  
1100 VOLTS  
ACCORDING TO IS 7098(Part 1):1988  
(Including Amendment Nos.1 to 4)**

1. **LABORATORY** – A laboratory shall be maintained which shall be suitably equipped and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
  - 1.1 All testing apparatus shall be periodically checked and calibrated records of such checks/calibration shall be maintained.
2. **TEST RECORDS** - All records of tests and inspection shall be kept in suitable forms approved by the Bureau.
  - 2.1 Copies of any records and other connected papers that may be required by the Bureau shall be made available at any time on request.
3. **QUALITY CONTROL** – It is recommended that, as far as possible, Statistical Quality Control (SQC) methods may be used for controlling the quality of the product during production as envisaged in this Scheme [See IS 397(Part I):2003 to IS 397 (Part 4):2003].
  - 3.1 In addition, effort should be made to gradually introduce Quality Management system in accordance with IS/ISO 9001: 2000
4. **STANDARD MARK** – The Standard Mark, as given in Column (1) of the First Schedule of the licence, shall be stenciled on the drum along with other information about the cable; provided always that each length of the cable wound on the drum conforms to every requirement of the specification.
  - 4.1 **OTHER MARKINGS** - In addition the cable shall carry the information according to clause 18.2 of IS 7098(Part 1) either stenciled on the drum or contained in a label attached to it, and also the identification in code or otherwise to enable the date and lot manufacture to be traced back to factory records.
  - 4.2 *The manufacturer's identification and cable identification shall be done as per clause 17.1 and 17.2 of IS 7098(Part 1).*

4.3 The Standard Mark shall be applied on the label or a tag, in such a manner, that as far as possible, it gets destroyed when the drums are opened for using the cable, as otherwise it may be fraudulently used by any person so as to deceive the consumers.

4.4 The cut ends of the cable shall be sealed by means of non-hygroscopic sealing materials.

5. **LEVELS OF CONTROL** - The tests, as indicated in Table 1 attached and at the levels of control specified therein, shall be carried out on the whole production of the factory which is covered by this scheme and appropriate records and charts maintained in accordance with paragraph 2 above. All the production which conforms to the Indian Standards and covered by the licence shall be marked with certification mark of the Bureau.

5.1 On the basis of test and inspection results, the decision regarding conformity or otherwise of the cables to the requirements of the specification shall be taken as given in remarks column of Table 1.

5.2 In respect of all other clauses of the specification the factory will maintain appropriate control and checks to ensure that their product conforms to the various requirements of this specification.

6. **MATERIALS** - *The Various raw material used in the manufacturer of cables shall conform to the various requirements as given in section 2 of IS 7098(Pt.1).*

7. **REJECTIONS** - A separate record shall be maintained giving information relating to the rejection of the production not conforming to the requirements of the specification and the method of its disposal. Such material shall in no circumstances be stored together with those conforming to the specification.

8. **SAMPLES** - The licensee shall supply, free of charge, the samples required in accordance with the Bureau of Indian Standards (Certification) Regulations, 1988, as subsequently amended, from the factory or godowns. The Bureau shall pay for the samples taken by it from the open market.

9. **REPLACEMENT-** whenever a complaint is received soon after the goods with Standard marks have been purchased and used, and if there is adequate evidence that the goods have not been misused, defective goods are replaced free of cost by the licensee in case the complaint is proved to be genuine and the warranty period (where applicable) has not expired. The final authority to judge the conformity of the product to the Indian Standard shall be with the Bureau. The firm shall have own complaint investigation system as per IS/ISO 10002.

9.1 In the event of any damages caused by the goods bearing the standard Marks, or claim being filed by the consumers against BIS Standard mark and not “conforming to” the relevant Indian Standard, entire liability arising out of such non conforming product shall be of licensee and BIS shall not in any way be responsible in such cases.

10. **STOP MARKING** - The marking of the product shall be stopped under intimation to the Bureau if, at any time, there is some difficulty in maintaining the conformity of their product to the specification, or the testing equipment goes out of order. The marking may be resumed as soon as the defects are removed under intimation to Bureau.

10.1 The marking of the product shall be stopped immediately if directed to do so by Bureau for any reason. The marking may then be resumed only after permission by the Bureau. The information regarding resumption of marking shall also be sent to the Bureau.

11. **PRODUCTION DATA** -The licensee shall send to BIS as per the enclosed proforma- 1 to be authenticated by a Chartered Accountant a statement of quantity produced, marked and exported by him and the trade value thereof at the end of each operative year of the licence.

Table 1.....

**IS 7098 (Part 1):1988**  
**CROSSLINKED POLYETHYLENE INSULATED THERMOPLASTIC SHEATHED CABLES**  
**FOR WORKING VOLTAGES UPTO AND INCLUDING 1100 VOLTS**  
**TABLE 1 LEVELS OF CONTROL**  
**(Para 5 of the Scheme of Testing and Inspection)**

TEST DETAILS					LEVELS OF CONTROL		
Cl.	Requirement	Test Methods			No. of samples	Lot Size/ Frequency	Remarks
		Clause	Reference	Part no. of IS 10810			
15.1 (a)	<b>Tests on Conductor</b>						<b>1. These are in addition of production line checks at wire drawing stage.</b> <b>2.Until requirements after stranding are specified, annealing test may be confined to one sample out of ten units or part there of received before stranding.</b>
(i)	<b>Annealing test (For copper)</b>	6.1.2	IS 8130	1	<b>One</b>	<b>Each length of finished cable</b>	
(ii)	<b>Tensile test (for aluminum)</b>	6.2.1	IS 8130	2			
(iii)	<b>Wrapping Test (for aluminum)</b>	6.2.2	IS 8130	3			
(iv)	<b>Resistance test</b>	6.3	IS 8130	5			
15.1(b)	<i>Tests for round steel wire/formed steel wire (strip) armour</i>	13.3, 13.6 (Amendment No.3)	7098(Pt.1)	36-42	<b>One</b>	<i>Each length of finished cable of each size &amp; type manufactured from the same consignment of armour/formed wires.</i>	<i>No testing of armouring wires/formed wires is required if it is received with 'ISI' mark, records to this effect to be maintained.</i>
15.4©	<b>Resistance of armour</b>	Table 7	-do-	42	<b>One</b>	<b>Each length of finished cable</b> <b>For cable meant for use in mines the resistance of Armour shall not exceed that of conductor by more than 33%</b>	

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Cl.	Requirement	Test Methods			No. of samples	Lot Size/ Frequency	Remarks
		Clause	Reference	Part No. of IS 10810			
3 to 7	<i>Materials</i>	3 to 7	IS 7098 (Pt.1)	-	One	Each length of conductors/ <i>finished</i> <i>cable</i>	
8	Construction of conductor	8					
9.4	Application of insulation	9.4					
10	Core identification	10					
11	Laying up of cores	11					
12	Inner sheath	12					
13	Armouring	13.1 13.2 or 13.3 & 13.4					
15.1©	Thickness of insulation & sheath	9,12&14	7098 (Pt.1)	6	One	Each length of finished cable	
15.1(d)	Physical tests on insulation						Whenever there is change in formulation of XLPE compound, additional sample shall be tested.
(i)	Tensile Strength and elongation at break	Table 1	-do-	7	One	Cable of each size and type manufacturing in a day	
(ii)	Ageing in Air oven	-do-	-do-	11	One	Cable of each size & type manufactured in a fortnight or 25 delivery lengths of same size & type, which ever is less	
(iii)	Hot set test	-do-	-do-	30			
(iv)	Shrinkage test	-do-	-do-	12			
(v)	Water absorption (gravi metric)	-do-	-do-	33			

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Cl.	Requirement	Test Methods			No. of samples	Lot Size/ Frequency	Remarks
		Clause	Reference	Part no. of IS 10810			
15.1 (e)	Physical test on outer sheath						Whenever there is a change in formulation of <i>outer sheath compound</i> additional sample shall be tested.
(i)	Tensile strength and elongation at break	Table 2	IS 5831	7	One	Cable of each size & type manufactured in a day	
(ii)	Ageing in air oven	-do-	IS 5831	11	One	Cable of each size & type manufactured in a fortnight or 25 delivery lengths of same size & type, which ever is less	
(iii)	Less of mass in air oven		IS 5831	10			
(iv)	Shrinkage test		IS 5831	12			
(v)	Hot deformation		IS 5831	15			
(vi)	Heat shock test		IS 5831	14			
(vii)	Thermal stability	IS 5831	60				
15.1 (f)	Insulation resistance (volume resistivity)	Table 1	IS 7098(Pt.1)	43	One	Each length of finished cable	
15.1 (g)	High voltage test	16.2	-do-	45			
15.1(h)	Flammability	16.3	-do-	53	One	Cable of each size & type manufactured in a month or 25 delivery lengths of same size & type, which ever is less	
15.4 (a)	* Cold bend test for outer sheath	Table 2	IS 5831	20	One		
15.4 (b)	* Cold impact test for outer sheath	-do-	-do-	21	One		

- Note: Optional tests to be carried out when requires by agreement between purchaser and suppliers.

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Clause	Requirement	Clause	Reference	Test Methods Part	Reference	No. of Samples	Frequency	Remarks
<b>Additional type tests for cables with Improved Fire Performance</b>								
15.1.1 and Appendix A	Oxygen Index Test	16.4	IS 7098 (Pt.1)	58	IS 10810	One	Every month for each size and type from one consignment of outer sheath compound.	For Category C1 and C2 Sample to be taken from outer sheath, as applicable, and prepared in the manner given in the relevant test method.
	Flame Retardance Test on single cable	16.5	-do-	61	IS 10810			--do--
	Flame Retardance Test on bunched cable	16.6	-do-	62	IS 10810			--do--
	Temperature Index	16.9	-do-	64	IS 10810			--do--
	Test for specific optical density of smoke	16.7	-do-					Under consideration
	Smoke Density	16.10	-do-	63	IS 10810			For Category C2 Sample to be taken from outer sheath, as applicable, and prepared in the manner given in the relevant test method.
	Test for Halogen acid gas evolution	16.8	-do-	59	IS 10810			--do--

## PERFORMA - 1

### PROFORMA FOR OBTAINING PRODUCTION DETAILS

Period covered

Name of Licensee

CM/L No.

Name of Articles (s) IS No.  
Grade/Type/Size/Variety/Class/Rating

1.1 Brand/Trade/Name(s) of BIS Certification Marked Products

2.0 Total production of the articles(s)  
licensed for certification marking

2.1 Total production of the article(s)  
conforming to Indian Standard

3.0 Production covered with BIS  
Certification Mark and its value  
a) Quantity

b) Value (Rs.)

3.1 Brand Name used on production covered under BIS Certification Mark

3.2 Calculation of marking fee on unit-rate basis; Marking Fee per unit

a) Unit

b) Quantity covered with BIS Certification Mark

c) Marking fee rounded off in whole rupees as obtained by applying unit rates given  
in (a) on quantity given in (b)

Note: In case a clause is not applicable, suitable remarks may be given against it.

4.0 Quantity not covered with BIS Certification Mark. If any, and the reasons for  
such non-coverage

4.1 Brand Name under which non certified goods were sold

5.0 Quantity Exported with BIS Standard Mark and its value

5.1 Brand Name under which BIS Certified goods are exported

6.0 Authentication by Chartered Accountant