



**PRODUCT MANUAL FOR
BOXES AND ENCLOSURES FOR ELECTRICAL ACCESSORIES
FOR HOUSEHOLD AND SIMILAR
FIXED ELECTRICAL INSTALLATIONS
ACCORDING TO IS 14772:2020**

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 14772: 2020
	Title	:	Boxes and Enclosures for Electrical Accessories for Household and Similar Fixed Electrical Installations
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	NA
b)	Grouping guidelines	:	Please refer <u>ANNEX-A</u>
c)	Sample Size	:	4 nos
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 :	:	Please refer <u>ANNEX –D</u>
6.	Scope of the Licence :	:	Please refer <u>ANNEX –E</u>

ANNEX-A

Grouping guidelines

1. Following aspects of the product shall be taken into consideration for grouping of different varieties of 'Boxes and Enclosures for Accessories for household and similar fixed electrical installations' as per IS 14772: 2020 for GOL/CSoL:
 - i. Nature of the Material (Insulating/ Metallic/ Composite/ Natural or synthetic rubber or a mixture of both)
 - ii. Type of installation
 - a. Flush, Semi-flush in Solid Walls, Ceilings or Floors (Not suitable for installation into concrete/ Suitable for installation into concrete with a maximum temperature during the casting Process of +60 °C/ Suitable for installation into concrete with a maximum temperature during the casting process of +90 °C)
 - b. Flush or Semi-flush in Hollow Walls, Hollow Ceilings, Hollow Floors or Furniture (Class Ha / Class Hb)
 - c. Surface Mounting on Walls, Ceilings, Floors or Furniture
 - iii. Type of inlet (outlet)
 - a. With inlet for Sheathed Cables for Fixed Installations
 - b. With inlet for Flexible Cables
 - c. With inlet for Plain or corrugated Conduits
 - d. With inlet for Threaded Conduits
 - e. With Inlets for Other Types of Conductors/Cables or Conduits
 - f. With Spouts (hub)
 - g. Without Inlets
 - iv. Clamping means
 - a. With Cable Retention
 - b. With Cable Anchorage
 - c. With Clamping Means for Flexible Conduit
 - d. Without Clamping Means
 - v. Minimum Temperature during installation (-5°C / -15°C / -25°C)

- vi. Degree of protection against direct contact and harmful ingress of solid objects and of harmful ingress of water
 - vii. Provision for fixing accessories to boxes
 - a. Boxes Supplied with Screws
 - b. Boxes intended to receive Screws
 - c. Boxes intended to receive Claws
 - d. Boxes Intended to Receive Other Means
 - viii. Method of fixing the terminals or connecting devices in the connecting box
 - a. With integrated clamping units
 - b. With incorporated terminals or connecting devices
 - c. With provisions for subsequent incorporation of terminals or connecting devices
 - d. Without fixing (for floating terminals or connecting devices)
2. One Enclosure and Box of each type for each of the classification aspect mentioned above (1 i to 1 viii) shall be tested to cover that particular type in the scope.
3. However, the following relaxation may be permitted when a variety is tested for all the requirements:
- a. For 1.i - If composite enclosures/ boxes are tested, insulating and metallic enclosures may also be covered.
 - b. For 1.ii.a - If enclosures/ boxes suitable for installation into concrete with a maximum temperature during the casting process of +90 °C is tested, enclosures suitable for installation into concrete with a maximum temperature during the casting process of +60 °C may also be covered.
 - c. For 1.iii - If enclosures/ boxes at (d) or (f) are tested, all other types may be covered without further testing. If enclosures/ boxes at (a), (b), (c) or (e) are tested, all other types except (d) and (f) may be covered without further testing. If enclosures/ boxes with inlets (outlets) are tested, enclosures without inlets (outlets) may also be covered.
 - d. For 1.iv - At least one enclosure/ box of each type shall be tested to cover all types in the scope. If enclosure/ box with clamping means is tested, enclosures/ boxes without clamping means may also be covered.

- e. For 1.v - If enclosures/ boxes with a lower minimum temperature during installation is tested, higher minimum temperatures may also be covered. For e.g., if enclosures/ boxes of minimum temperature -15°C is tested, -5°C may also be covered.
 - f. For 1.vi - If an enclosure with a particular degree of protection is tested, enclosures with lower degrees of protection may also be covered.
 - g. For 1.vii - Box of any one type may be tested to cover all types in the scope.
 - h. For 1.viii - Boxes at (a) or (b) may be tested to cover all types in the scope.
4. The Firm shall declare the varieties of various Enclosures/ Boxes 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 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	Marking (Cl. No. 8)	Piece of cloth, Water, Petroleum spirit
2	Dimensions (Cl No. 9)	Calliper, micrometer, gauges
3	Protection Against Electrical Shock (Cl. No. 10)	Unjointed Test Finger/Test Probe 11 according to IS 1401, Push-pull gauge, Stopwatch Mandrel with 6mm dia
4	Provision for Earthing (Cl. No. 11)	AC Source- 12V 25A, Multi-meter for measuring voltage drop, current, resistance Heating cabinet, Figure 4: Test strap, Screwdriver or spanner with torque meter, Load of 45 N (if a tensile machine is used: jaw separation speed of 10 mm/min), Stop watch
5	Construction (Cl. No. 12)	Test probe B of IS 1401/ Jointed test finger, Push-pull gauge, arrangement for test on covers or cover plates, Suitable loads (Table 2), Sheet of hard material ($1 \pm 0,1$) mm thick, Stop watch, Gauges as per Figure 6 and 9, Vernier callipers, micrometer, Apparatus as per Figure 11 for testing the cable anchorage, Screwdriver or spanner with torque meter, Loads (range according to Table 3), Apparatus for the torque test (range according to Table 3) Test chamber, suitable load, 6 mm diameter mandrel with a flat end, suitable Load Refrigerator adjustable to $-5\text{ }^{\circ}\text{C}/-15\text{ }^{\circ}\text{C}/-25\text{ }^{\circ}\text{C}$ Screwdriver or spanner with torque meter (range according to Table 4) Test wall as per manufacturer's instructions/ sheet of plywood (10 ± 1) mm thick, 500 mm wide and 500 mm high, Lever according to according Figure 15, Force applicator, (38 x 90) mm wood structural member, movement measurement apparatus

		<p>(38 x 190) mm wood structural member, deflection measurement apparatus</p> <p>steel-stud structural member as shown in Fig. 16,</p> <p>Flat transparent plate not more than 3,2 mm thick (cover of Figure 17)</p> <p>Graduated cylinder or measuring flask</p> <p>9.5 mm thick plywood sheet reinforced with support,</p> <p>Screwdriver</p> <p>cylindrical metal rod, Spanner or suitable tool with torque meter (range according to Table 5)</p> <p>Conduits of minimum nominal size according to IS 14763 or IEC 60981</p>
6	Resistance to ageing, protection against ingress of solid objects and against harmful ingress of water (Cl. No. 13)	<p>cylindrical metal rod, Spanner or suitable tool with torque meter,</p> <p>Hot Air Oven</p> <p>Humidity Chamber</p> <p>Grommets (with membranes)</p> <p>Unjointed Test Finger/Test Probe 11 according to IS 1401</p> <p>Push force applicator</p> <p>Refrigerator adjustable to -15 °C/-25 °C</p> <p>IP test apparatus as per IS/IEC 60529</p>
7	Insulation resistance and electric strength (Cl. No. 14)	<p>Humidity chamber with relative humidity (91 to 95) % RH, temperature (20 to 30 ±1) °C, - DC source of 500V and instruments, Metal foil, Stop watch, Megger, Suitable HV source.</p>
8	Mechanical strength (Cl. No. 15)	<p>Vertical hammer test apparatus according to Figure 21, or, on larger enclosures, spring hammer according IS 9000 (Part 7/Sec 7)</p> <p>pad of closed cell expanded sponge rubber 40 mm thick when uncompressed and having a density of approximately 538 kg/m³</p> <p>Refrigerator adjustable to (-5 ± 2) °C/ (-15 ± 2) °C/ (-25 ± 2) °C</p> <p>1 kg mass</p> <p>Heating cabinet adjustable to (90 ± 5) °C</p> <p>Flat hardwood plates</p> <p>Load of (500 ± 5) N</p> <p>Stop watch</p>

		<p>Pendulum hammer test apparatus as described in IS 9000 (Part 7/Sec 7) (test EHA), with an equivalent mass of 250 g, or on larger enclosures, spring hammer according IS 9000 (Part 7/Sec 7)</p> <p>Mounting block made from an 8 mm thick, 175 mm x 175 mm plywood sheet and mounting support with a mass of (10 ± 1) kg, Tape plywood with a thickness of (9 ± 1) mm, deflection measurement apparatus, Force applicator</p>
9	Resistance to Heat (Cl. No. 16)	<p>Ball Pressure Test Apparatus, Hot Air Oven</p> <p>Stop watch, Suitable device for measurement of impression</p> <p>rigid crossbar, Screwdriver or spanner with torque meter</p>
10	Creepage distances, clearances and distances through sealing compound (Cl. No. 17)	Vernier Callipers
11	Resistance of insulating material to abnormal heat & to fire (Cl. No. 18)	Glow-wire test apparatus, pinewood board covered with a tissue paper
12	Resistance to tracking (Cl. No. 19)	Tracking test apparatus according to IS 2884
13	Resistance to corrosion (Cl. No. 20)	<p>Suitable degreasing agent, Ammonium chloride</p> <p>Humidity chamber</p> <p>Heating cabinet</p> <p>Stop watch</p>

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 14772:2020.

4. CONTROL UNIT – Enclosures/ Boxes of each classification/type manufactured from the same batch of raw material 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 Standards 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 Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4	General requirements	4	IS 14772	-	Each Enclosure/ Box	-	
6	Rating	6	IS 14772	-	Each Enclosure/ Box	-	
8	Marking & visual Examination (except 8.2)	8	IS 14772	-	Each Enclosure/ Box	-	
8	Marking & visual Examination (8.2)	8.2	IS 14772	R	1	-	
9	Dimension	9	IS 14772	R	Each Enclosure/ Box		
10	Protection Against Electrical Shock	10	IS 14772	R	Each Enclosure/ Box		
11	Provision for Earthing	11	IS 14772	S	3	Every month for each classification, made from the same source of raw material.	
12	Construction	12	IS 14772	S	3		
13	Resistance to ageing; protection against ingress of solid objects and against harmful ingress of water	13	IS 14772	S	3		
15	Mechanical strength	15	IS 14772	S	3		
14	Insulation resistance and electric strength	14	IS 14772	S	3		
16	Resistance to Heat	16	IS 14772	S	3	Every six months for for each classification, made from the same source of raw material..	
17	Creepage distance, clearance and distance through seating compound	17	IS 14772	S	3		
18	Resistance of insulating material to abnormal heat and to fire	18	IS 14772	S	3		
19	Resistance to tracking	17	IS 14772	S	3		
20	Resistance to Corrosion	20	IS 14772	S	3	-	
21	Electromagnetic compatibility (EMC)	21	IS 14772	-	-	-	

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.

ANNEX-D

Possible tests in a day

- (i) Marking (Cl. No. 8)
- (ii) Dimensions (Cl No. 9)
- (iii) Protection Against Electrical Shock (Cl. No. 10)
- (iv) Provision for Earthing (Cl. No. 11)
- (v) Resistance to Heat (Cl. No. 16)
- (vi) Resistance of insulating material to abnormal heat & to fire (Cl. No. 18)

ANNEX-E**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 14772: 2020 with the following scope:	
Name of the product	Boxes and Enclosures for Electrical Accessories for Household and Similar Fixed Electrical Installations
Nature of Material	Insulating/Metallic/Composite/ Natural or synthetic rubber or a mixture of both
Type of Installation	<ul style="list-style-type: none"> • Flush, Semi-flush in Solid Walls, Ceilings or Floors (Not suitable for installation into concrete/ Suitable for installation into concrete with a maximum temperature during the casting Process of +60 °C/ Suitable for installation into concrete with a maximum temperature during the casting process of +90 °C) • Flush or Semi-flush in Hollow Walls, Hollow Ceilings, Hollow Floors or Furniture (Class Ha / Class Hb) • Surface Mounting on Walls, Ceilings, Floors or Furniture
Type of inlet (outlet)	With inlet (outlet) for Sheathed Cables for Fixed Installations/ Flexible Cables/ Plain or corrugated Conduits/ Threaded Conduits/ Other Types of Conductors/Cables or Conduits / With Spouts (hub)/ Without inlet (outlet)
Clamping means	With Cable Retention / with Cable Anchorage/ with Clamping Means for Flexible Conduit/ Without Clamping Means
Minimum Temperature during Installation	-5°C / -15°C / -25°C
Degree of Protection	Upto and including IPXX
Provision for fixing accessories to boxes	Boxes Supplied with Screws/ Boxes intended to receive Screws/ Boxes intended to receive Claws/ Boxes Intended to Receive Other Means
Method of fixing the terminals or connecting devices in the connecting box	With integrated clamping units/ With incorporated terminals or connecting devices/ With provisions for subsequent incorporation of terminals or connecting devices/ Without fixing (for floating terminals or connecting devices)