PRODUCT MANUAL FOR SWITCHES FOR DOMESTIC AND SIMILAR PURPOSES ACCORDING TO IS 3854:1997

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 3854:1997
	Title	**:**	Switches for Domestic and Similar Purposes
	No. of amendments	**:**	7
2.	**Sampling Guidelines**		
a)	**Raw material**	**:**	NA
b)	**Grouping Guidelines**	**:**	Please refer Annex - A
c)	**Sample Size**	**:**	15 switches
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 Annex - D
6.	**Scope of the Licence :**		Please refer Annex - E
7.	**Any other guidelines**		Please refer Annex - F for guidelines for Outsourcing of Moulded Bodies

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ANNEX A

Grouping Guidelines

1. The following aspects of a switch shall be taken into consideration for grouping of different varieties of switches for the purpose of GoL/ CSoL:

   a. Current rating
   b. Voltage rating
   c. Possible connections or pattern
   d. Fluorescent rating
   e. Degree of protection against harmful ingress of water
   f. Contact opening
   g. Degree of protection against electric shock
   h. Method of activating the switch
   i. Method of application
   j. Type of terminals

2. To cover a range of current ratings, switches from the minimum, maximum and an intermediate rating of that range shall be tested.

3. To cover a range of voltage ratings, switches with ratings upto and including 250 V are considered as one group and above 250 V as another group and switches from both the groups shall be tested.

4. The following relaxation may be given when a variety is tested for all the requirements:

a) If a particular voltage rating is tested, lower ratings in the same group may be covered.

b) If a pattern is tested, additions pattern may be covered as given below:

Pattern tested	Additional Pattern
6	1
4	6,1
6/2	2
7	6/2, 2
03	3

c) If switch with fluorescent rating (AX) is tested, switches without fluorescent rating (A) may be covered.

d) If switch with a particular degree of protection (IPX0, IPX4 and IPX5) is tested, switches with lower degree of protection may be covered.

5. For all other aspects mentioned at 1.1(f) to 1.1(j) above, at least one switch of each aspect shall be tested to cover the entire range.

6. The Firm shall declare the varieties of Switches intended to be covered in the Licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities of the manufacturer.

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 Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Test Equipment	Tests used in with Clause Reference
1	Petroleum Spirit	Marking - 8.9
2	Vernier Calliper	Dimensions - 9
3	Un-jointed test finger, Standard test finger , Voltmeter , Voltage Source with indicator	Protection against electric shock - 10
4	Low voltage source with Voltmeter and ammeter	Earthing Resistance - 11.4
5	Humidity Controlled Cabinet, Thermometer Hygrometer	Resistance to Humidity - 15.3
6	Megger (500 V dc)	Insulation resistance - 16.1
7	High voltage Tester (ac), Voltmeter, Ammeter	Electric strength (flash test) - 16.2, 16.3
8	Electrical Oven	Resistance to Ageing, Heat, Rusting - 15, 21, 25
9	Temperature Rise Test Equipment, Thermometer (Digital), Ammeter, Pine wood block	Temperature Rise Test, Making-Breaking and Normal Operation Test - 17,18, 19
10	Torque Screw Driver	Terminals - 12, 13, 22
11	Test Apparatus, cycle counter, ON Timer OFF Timer, Inductive Load of required power factor, Voltmeter, Auto Transformer, PF Meter, Tungsten Filament Lamp load, Fluorescent Lamp Load	Making-Breaking Capacity and Normal operation test – 18, 19
12	Mechanical Strength (Impact test apparatus) with plywood base for mounting (Pendulum Type)	Mechanical Strength - 20
	Cylinder of steel sheet and flat steel sheet (for surface type switches)	20.2
	Cylindrical metal rod	20.3
	Setup for verification of removal and non-removal of covers	20.4
	Gauges as per Fig 20 & 23	20.7, 20.8
	Test setup on cord operated switch	20.9
13	Ball Pressure Apparatus, Magnifying glass	Resistance to heat – 21
14	CCL4, NH4Cl, Distilled Water & Beaker	Resistance to Rusting – 25
15	Splash proof / Jet proof test setup (for IPX4/IPX5)	15.2
16	Glow Wire Test Apparatus with Temperature Indicator & Controller, Timer pre-set Time Interval Indicator, Tracking test apparatus (for switches other than ordinary)	Resistance to Abnormal Heat, Fire and Tracking - 24
17	Weighing Balance, Weights	Resistance to Ageing - 15.1

18	Test setup for checking conductor damage with rotational speed controller and weights	Terminals & Screws - 12.2.5
19	Test setup for mechanical stress, electrical and thermal stress, and Deflection test on Screwless terminals	Screwless Terminal testing - 12.3.10, 12.3.11, 12.3.12
20	Testing arrangement for knob of rotary switches	13.5
21	Fixture for membrane reliability test	13.15
22	Pull force test on cord operate switch	14.6

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 equipments.

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 3854:1997. In addition, each switch or the packaging of the switch shall carry the identification mark in code or otherwise for traceability.

4. CONTROL UNIT – Switches of same type and rating manufactured 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.

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
		Clause	Reference			
8	Marking (except 8.9)	8	IS 3854	---	Each switch	
16.3	Electric Strength (Flash test)	16.3		R	Each switch	
8.9	Marking	8.9		R	3	Each control unit
10	Protection against electric shock	10		R	3	Every week for each type and rating
11	Provision for earthing	11		S	Pl see Note 1	Once in three months for each type and rating
12	Terminals	12		S		
13	Constructional requirements	13		S		
14	Mechanism	14		S		
15	Resistance to ageing, harmful ingress of water, humidity	15		S		
16	Insulation resistance and electric strength	16		S		
17	Temperature rise	17		S		
19	Normal operation	19		S		
20	Mechanical Strength	20		S		
21	Resistance to heat	21		S		
22	Screws, current carrying parts and connections	22		S		
23	Creepage distances, clearance and distances through sealing compound	23		S		
25	Resistance to rusting	25		S		
24	Resistance to abnormal heat, fire and tracking	24		S	3	Once in a year or whenever there is change in raw material
18	Making and breaking capacity	18		S	3	Once in three years for each type and rating

Note-1: The number of specimens for testing shall be selected as per clause 5.4 and Annex A of IS 3854. In case of any failure, the provisions given in clause 5.5 of IS 3854 shall be followed.

Note-2: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-3: The control unit and levels of control as decided by the Bureau are obligatory, to which the licensee shall comply with.

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ANNEX D

Possible Tests in a day

1. Marking – Cl. 8
2. Protection Against Electric Shock - Cl. 10
3. Electric Strength (Flash Test) - Cl. 16.3
4. Temperature Rise - Cl.17
5. Making and breaking capacity – Cl. 18.1
6. Mechanical Strength - Cl. 20
7. Resistance to heat – Cl. 21
8. Screws, current carrying, parts and connections - Cl. 22
9. Creepage distance and clearances - Cl. 23
10. Resistance to rusting – Cl. 24

ANNEX E

Scope of Licence

Licence is granted to use Standard Mark as per IS 3854:1997 with the following scope:

Name of the Product	Switches for domestic and similar purposes
Rated Current	
Rated Voltage	
Nature of supply	
Possible Connections (Pattern Number)	
Fluorescent rating	AX/A
Contact opening	Normal gap construction / mini-gap Construction
Degree of protection against Electric Shock	Unenclosed / Enclosed
Degree of protection against harmful ingress of Water	IPX0/IPX4/ IPX5
Method of activating the switch	Rotary/ Tumbler/ Rocker/ Push-Button/ Cord-operated
Method of Application	Surface/ Flush/ Semi-Flush/ Panel/ Architrave Type
Type of Terminals	Screw-type terminals/ Screwless terminals for rigid conductors only/ Screwless terminals for rigid and flexible conductors only

ANNEX – F

Guidelines for Outsourcing of Moulded Bodies

a) Outsourcing of moulding facilities may be permitted with the following organizations (Moulder):

For Domestic Manufacturers

- Any dedicated moulding unit in the conforming/ authorized industrial area and located under the jurisdiction of the same Branch Office.
- Any other unit of the Licensee/ Applicant or their sister concern, which is having a valid BIS licence for the same product under the jurisdiction of the same Branch Office.

For Foreign Manufacturers

- Any dedicated moulding unit in the conforming/ authorized industrial area and located in the same city where the applicant/ licensee is located.

b) The dedicated moulder shall not carry out moulding for units other than the particular Applicant/ Licensee.

c) The Manufacturer shall take the following actions:

- Enter into an agreement with the moulder which shall comprise, interalia, the terms and conditions for moulding including the condition of dedicated moulding, period of agreement etc.
- Declare the Items and Brands for which he intends to outsource moulding.
- Declare the name, ownership details, address, details of the responsible person, phone number, etc. of the moulder.

d) It shall be the responsibility of the licensee (the firm which is outsourcing the moulding activity) to ensure that no finished material is produced or assembled at any place other than the licensed premises and he shall be responsible for any misuse of ISI mark at the moulder's premises. An Undertaking to this effect shall be furnished to BIS.

e) Records of raw material issued date-wise, moulded material received back date-wise and item-wise shall be maintained by the licensee. Similar records shall also be maintained by the moulder.

f) The moulder shall ensure that there is a separate dedicated space for keeping moulded components as well as the raw materials received from the licensee. Colour coding of bins/ separate storage location etc. may be used to ensure easy and quick traceability. Appropriate records are to be maintained at both the units.

g) The licensee shall ensure that there are adequate means of ensuring the quality of incoming outsourced moulded bodies.

h) For applications received with request for outsourcing of moulding facilities, a special inspection of the moulder's premises shall be carried out to adjudge the capability of the moulder in addition to the preliminary inspection at the applicant's premises. Special Inspection Charges and any other charges, as applicable, for this visit shall be collected from the applicant in advance. The process flow chart submitted by the applicant shall clearly indicate the outsourcing of moulded bodies. The recommendations for GoL shall include details on outsourcing of moulding operation by the firm. The details of outsourcing may also be included in the GoL intimation letter.

i) For existing licensees who intend to outsource the moulding facility, the licensee shall submit a fresh process flow chart indicating the outsourcing of moulded bodies. The permission for outsourcing may be given to the licensee after complying with all the procedures including verification visit to the moulder's premises.

j) Whenever there is a change in the moulder, the licensee has to enter into a fresh agreement with the new moulding unit. The permission for outsourcing may be given to the licensee after complying with all the procedures including verification visit to the moulder's premises.

k) During the operation of the licence, records required to be maintained at the licensee end with respect to outsourced moulding shall be verified during surveillance visit at the licensee's premises by BIS Certification Officer.

l) BIS Officer(s) shall have access to the moulder's premises and if at any time the same is denied, permission for outsourcing shall be withdrawn. An undertaking in this respect shall be obtained.

m) For Domestic manufacturers, the visit to moulder's premises may be taken up as a special visit as and when needed. Special Inspection Charges for this visit shall be collected from the licensee after the visit. An undertaking from the licensee regarding payment of such charges shall be obtained.

n) For Foreign manufacturers, BIS shall maintain surveillance over the moulder's premises in addition to the manufacturer's premises. Special inspection charges and all other applicable charges for this visit shall be payable by the licensee.

Note:

- The Indian Standard does not impose any restriction on the manner/ method of Marking so long as the Durability clause is complied with. As such, the product may be marked with the Standard Mark, CM/L Number, Manufacturer's Brand and other markings during the process of moulding itself, in which case all the conditions stated above shall apply.
- However, if the Marking on the moulded bodies is done at the Licensee's own premises by other means such as pad printing/ laser marking etc, the moulded component may be treated as any other bought out component/ raw material as these are not marked with the ISI Mark or CM/L Number during the outsourced moulding process. Notwithstanding this, the Applicant/ Licensee shall ensure that there are adequate means of ensuring the quality of the incoming components.