



**PRODUCT MANUAL FOR
CONDUIT FITTINGS FOR ELECTRICAL INSTALLATIONS -
METAL CONDUIT FITTINGS
ACCORDING TO IS 14768 (Part 2): 2003**

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 14768 (Part 2): 2003
	Title	:	Conduit Fittings for Electrical Installations - Metal Conduit Fittings
	No. of Amendments	:	1
2.	Sampling Guidelines:		
a)	Raw material	:	-
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	40 nos. (along with adequate length of conduit of the type for which the fitting is intended)
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 :		
	(a)	Dimensions, Cl. 8	
	(b)	Impact Test, Cl. 10.3	
	(c)	Electrical Characteristics, Cl. 13	
	(d)	Tests on joints, Cl. 15	
6.	Scope of the Licence :	:	Please see ANNEX - D

ANNEX-A

Grouping Guidelines

1. IS 14768 (Part 2): 2003 covers the following Types of Metal Conduit Fittings:

- (a) Couplers, Non-Threaded
- (b) Couplers, Internally Threaded
- (c) Internal Entries
- (d) Entries, Externally Threaded
- (e) Plain Bends
- (f) Non-Threaded Bends
- (g) Internally Threaded Bends
- (h) Externally Threaded Bends
- (i) Tees
- (j) Circular Boxes
- (k) Rectangular Boxes
- (l) Circular Looping Boxes

2. The Metal Conduit Fittings are classified according to the following:

- (a) Type of Conduit Entry- Threadable / Non-threadable
- (b) Mechanical Property– Medium Stress/ Heavy Stress/ Very Heavy Stress
- (c) Suitability for Suspended Load – Suitable/ Non-suitable
- (d) Electrical Characteristics- With/ without Electrical Continuity
- (e) Resistance to External Influence - IPXX
- (f) Tensile Strength
 - Without declared Tensile Strength
 - With declared Tensile Strength for 3 kg load
 - With declared Tensile Strength for 10 kg load
 - With declared Tensile Strength for 50 kg load
- (g) Cantilever Strength – With/ without Cantilever Strength

3. Considering the above, the guidelines as given below shall be followed for GoL/CSoL:

- (a) For 1 (a) to 1 (i) above, Fittings of each type with highest nominal size shall be tested to cover all the sizes of that particular type of fitting.
- (b) For 1 (j) to 1 (l) above, Fittings of each type, of any design, with highest nominal size shall be tested to cover all the sizes of that particular type of fitting.
- (c) Fittings of each grade of mechanical stress shall be tested separately.

4. However, the following relaxation may be permitted when a variety is tested for all the requirements:

Variety Tested	Additional Variety that may be covered
Threadable	Non-threadable
Suitable for a specified suspended load	i) Suitable for less load ii) Not suitable for suspended load
With Electrical Continuity	Without Electrical Continuity
Higher IP	Lower IP
Higher declared Tensile Strength	i) Lower declared Tensile Strength ii) Without declared Tensile Strength
With Cantilever Strength	Without Cantilever Strength

5. The manufacturer shall declare the varieties intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

6. 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	CL. 8 Dimensions	Gauges for male and female threads, gauges for checking minimum & maximum outside diameter, Gauges for measuring minimum inside diameter at bend, gauges for checking minimum & maximum inside diameter, Measuring tape, Vernier caliper, Micrometer
2	CL. 10.3 Mechanical properties (Impact test)	Impact test apparatus as per fig. 1 of IS 14768 (Part 1), Sponge pad, Hammer, Refrigerator
3	CL. 10.4 Mechanical properties (Suspended load test)	Suspension test setup, Load, test pin or test finger
4	CL. 13 Electrical characteristics (Electrical Impedance test, Fault current test, Earth terminal test)	Input test panel consisting of Ampere meter, voltmeter, frequency meter, resistance meter and variac transformer Fault current test panel consisting of Ampere meter, voltmeter, frequency meter and variac transformer Torque wrench/screw, stop watch
5	CL. 14.2 External influences (Degree of protection- ingress of solid objects)	Dust chamber/ Test means and main test conditions as per Table 7 of IS/IEC 60529:2009
6	CL. 14.3 External influences (Degree of protection- ingress of water)	Test means and main test conditions as per Table 8 of IS/IEC 60529:2009
7	CL. 15.1 Test on joints (Tensile strength test)	Torque wrench/screw, Tensile testing Machine
8	CL. 15.2 Test on joints (Cantilever strength test)	Cantilever strength test setup, Conditioning chamber, air conditioner, Torque wrench/screw
9	AC	General conditions of test 27±5°C
10	Construction, CL. 9	Screw Driver/ Spanner, with provision for applying torque

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 14768 (Part 2).

4. CONTROL UNIT – All conduits fittings of the same type, classification and size 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.

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 Samples	Frequency	Remarks
		Clause	Reference				
7	Marking	7.1, 7.2, Annex A	IS 14768 (Part 1)	R	Each Fitting	---	
8	Dimensions	8.1 to 8.2	IS 14768 (Part 1)	R	Two	Every hour	Sample shall be collected at random from the production line
		8.3	IS 14768 (Part 2)				
		Fig 4 & 5	IS 14763				
9	Construction	9.1 to 9.7	IS 14768 (Part 1)	R	Each Fitting	---	
10	Mechanical properties (Impact Test)	10.3	IS 14768 (Part 1)	R	Twelve Fittings from each type, classification & size	Once in three months	---
	Mechanical properties (Suspended Load Test)	10.4	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	---
13	Electrical characteristics						
13	Electrical Impedance Test	13.7	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	---
	Fault Current Test	13.8	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	---
	Earth Terminal Test	13.9	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	For fittings with earth terminal

14	External Influences						
14	Degree of Protection - Ingress of Solid Objects	14.2	IS 14768 (Part 1)	S	Three Fittings from each type, classification & size	Once in three months	---
	Degree of protection – Ingress of Water	14.3	IS 14768 (Part 1)	S	Three Fittings from each type, classification & size	Once in three months	---
15	Tests on Joints						
15	Tensile Strength Test	15.1	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	---
	Cantilever Strength Test	15.2	IS 14768 (Part 1)	R	Three Fittings from each type, classification & size	Once in a week	---

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**Scope of Licence**

“Licence is granted to use Standard Mark as per IS 14768 (Part 2): 2003 with the following scope:	
Name of the product	Conduit Fittings for Electrical Installations – Metal Conduit Fittings
Type of Fitting	
Size	
Type of Conduit Entry	
Mechanical Stress	Medium/ Heavy/ Very heavy
Suitability for Suspended Load	Suitable for suspended load up to and including...../ Not suitable
Electrical Continuity Characteristics	With/ Without
Resistance to External Influence (IP)	
Tensile Strength	
Cantilever Strength	