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IS 3837 (1976): Accessories for rigid steel conduits for electrical wiring [ETD 14: Electrical Wiring Accessories]



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IS : 3837 - 1976

(Reaffirmed 1996)

REAFFIRMED

2006

Indian Standard

**SPECIFICATION FOR
ACCESSORIES FOR RIGID STEEL CONDUITS
FOR ELECTRICAL WIRING**

(*First Revision*)

Sixth Reprint SEPTEMBER 2001

UDC 621.315.674

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BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI 110002

Indian Standard
SPECIFICATION FOR
ACCESSORIES FOR RIGID STEEL CONDUITS
FOR ELECTRICAL WIRING
(First Revision)

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(Continued on page 2)

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SPECIFICATION FOR ACCESSORIES FOR RIGID STEEL CONDUITS FOR ELECTRICAL WIRING (*First Revision*)

0. F O R E W O R D

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 23 February 1976, after the draft finalized by the Electrical Wiring Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard applies to accessories, mainly used to fix the conduit and the fittings in position, and that standard shall be read in conjunction with IS : 1653-1972* and IS : 2667-1964†.

0.3 The specification for accessories for rigid steel conduit was first published in 1966. The important features of this revision are as follows:

- a) To ensure international compatibility, the nominal diameters (except 63 mm) for accessories have been rationalized in line with the international practice;
- b) New sampling plan has been added; and
- c) Only mild steel has been retained for the material of the accessories except for bushes.

0.4 While preparing this standard, assistance has been derived from BS 4568 : Part II : 1970 ' Steel conduits and fittings with metric threads of ISO forms for electrical installations, Part II Fittings and components ' issued by the British Standards Institution.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Specification for rigid steel conduits for electrical wiring (*second revision*).

†Specification for fittings for rigid steel conduits for electrical wiring. (Since revised).

‡Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard specifies the material, dimensions and other requirements of accessories (other than fittings, *see* IS : 2667-1964*) used with rigid steel conduits for electrical wiring purposes conforming to IS : 1653-1972†.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions in addition to those specified in IS : 1653-1972† shall apply.

2.1 Accessories — Parts other than fittings (*see* IS : 2667-1964*) used in fixing steel conduits.

NOTE — Clips, saddles, pipe hooks, spacing plates, bush and lock nuts supporting and fixing the conduits are typical examples of accessories.

2.1.1 Spacing Plate — An accessory used to prevent the conduit from making intimate contact with damp plaster, cement walls and ceilings or gas and water pipes and to keep the conduit straight where it leaves the fitting.

NOTE — These spacing plates are used to prevent the conduit from making intimate contact with damp plaster, cement walls and ceilings or gas and water pipes.

2.1.2 Entry Bush — An accessory used to prevent abrasion where the conduit ends and where the conductors pass through.

2.1.3 Lock Nut — An accessory used along with coupler for connecting two lengths of conduit, neither of which may be turned.

2.1.4 Plug — An accessory used for closing unused threaded outlets of fittings.

3. CONSTRUCTION

3.0 General — The details of screw threads for screwed accessories shall be as specified in 4.2 of IS : 1653-1972† or 6 of IS : 2667-1964* as applicable.

3.1 The saddle shall be ribbed for reinforcement at the crown and shall be of such a structure as to be attached firmly on the surface of building structure (wooden) with two wood screws, one on each side.

3.2 Spacing Plates — The plates used for spacing the saddle or clips from wall shall be of such a thickness as to keep the conduit straight where it leaves the fittings. For example, this shall be equal to dimensions C minus half the nominal size of the conduit for the boxes (*see* Fig. 7 of IS : 2667-1964*).

*Specification for fittings for rigid steel conduits for electrical wiring. (Since revised).

†Specification for rigid steel conduits for electrical wiring (*second revision*).

3.3 Plug — The plug may be recessed to the thickness of the head, the thickness of the wall being not less than 3 mm.

3.3.1 The details of the screw threads shall be as specified in IS: 1653-1972*. The plug shall be externally threaded.

3.4 Lock Nuts

3.4.1 Hexagonal Lock Nuts — In the case of hexagonal lock nuts the width across flats (*see* IS: 2027-1967†) shall be in accordance with Table 6.

3.4.2 Round Lock Nuts — In the case of round lock nuts the edge shall be milled or castellated. The outer dia of this shall have straight rough knurling on it.

3.4.2.1 The dimensions of circular lock nuts may be given by the formula, namely, size of the conduit plus 6 mm, shall be the outer dia of the nut and the thickness same as for hexagonal nut.

3.5 Entry Bush — The inside edges of entry bushes shall be smoothly rounded in order to prevent abrasion of cables. Entries for the bushes shall be formed so as to prevent the conduit being screwed or pushed right through to the interior of the bush.

3.5.1 Round bushes shall have rough straight knurling on diameter.

3.5.2 The bushing shall have the ends of the threads processed by reaming.

4. PROTECTION AGAINST CORROSION

4.1 Accessories shall be adequately protected against rust and corrosion both outside and inside, excluding machines' surfaces and screw threads. Each accessory shall be supplied with medium or heavy protective coating which shall be smooth, continuous, tough and firmly adherent and free from rough and bare places and cracks.

4.1.1 Examples of medium protection are:

- a) stove enamelling,
- b) air drying paint, and
- c) electrolytic deposits.

4.1.2 Examples of heavy protection are:

- a) hot-dip galvanized coating, and
- b) sherardizing.

*Specification for rigid steel conduits for electrical wiring (*second revision*).

†Specification for widths across flats for spanners (*first revision*).

IS : 3837 - 1976

4.2 The enamel, if the fittings are enamelled shall be smooth, continuous, tough and firmly adherent, free from rough and missed places and cracks. The screw threads shall be free from enamel and shall have a rust protective coating.

4.3 The galvanized coating, if the fittings are galvanized, shall adhere firmly to the surfaces of the fittings and shall be smooth and uniform throughout.

4.4 Sherardized fittings, unless otherwise specified, shall have the threads also protected by the sherardizing process.

5. DIMENSIONS

5.1 The dimensions of the accessories shall comply with the appropriate tables as specified below:

Ordinary clips	Table 1
Single saddles	Table 2
Multiple saddles	Table 3
Pipe hooks and crampets	Table 4
Plugs	Table 5
Lock nuts	Table 6
Externally screwed hexagonal bushes	Table 7
Internally screwed circular bushes	Table 8

6. TOLERANCE

6.1 All dimensions except those for which tolerances are specifically stated herein or which are definitely stated as being maximum or minimum are to be recorded as nominal dimensions and subject to a tolerance of ± 5 percent.

7. MARKING

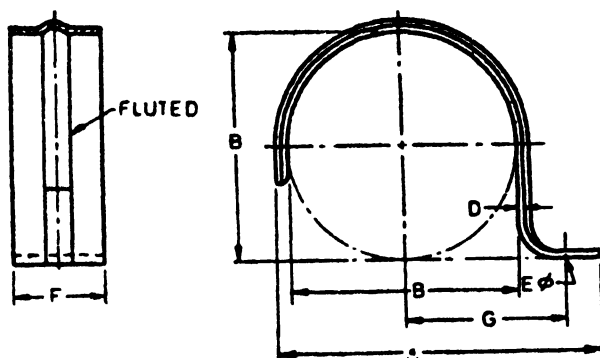
7.1 Each conduit accessory shall be clearly marked with the following:

- a) Manufacturer's name or trade-mark, if any; and
- b) Country of manufacture.

TABLE 1 DIMENSIONS FOR ORDINARY CLIPS
(Clause 5.1)

All dimensions in millimetres.

Material — Mild steel



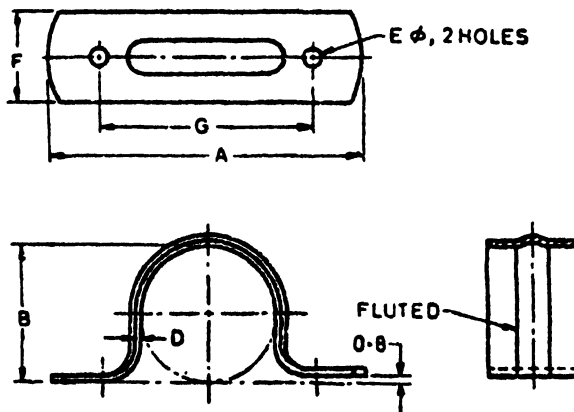
SIZE OF CONDUIT	A (Min)	B (Min)	D (Min)	E	F (Min)	G
(1)	(2)	(3)	(4)	(5)	(6)	(7)
16	35	16	0.71	4	15	18
20	40	20	0.9	4	20	20
25	45	25	0.9	5	20	22
32	55	32	1.25	5	25	26
40	65	40	1.25	5	25	30
50	75	50	1.25	5	25	35
63	90	63	1.25	5	25	42

NOTE — The number of flutes is optional.

TABLE 2 DIMENSIONS FOR SINGLE SADDLES
(Clause 5.1)

All dimensions in millimetres.

Material — Mild steel



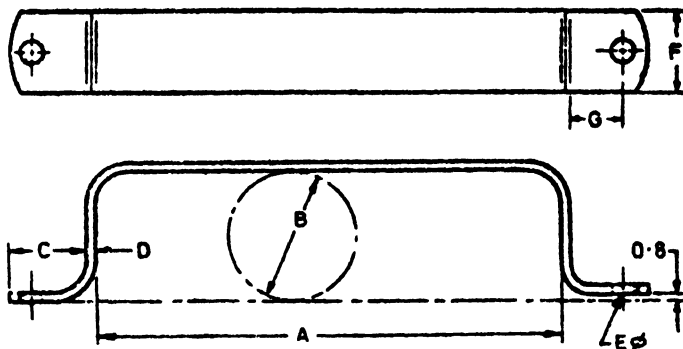
SIZE OF CONDUIT	A (Min)	B (Min)	D (Max)	E	F (Min)	G (Min)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
16	50	16	0.71	4	15	36
20	60	20	0.9	4	20	40
25	65	25	0.9	5	20	45
32	80	32	1.25	5	25	52
40	85	40	1.25	5	25	60
50	95	50	1.25	5	25	70
63	110	63	1.25	5	25	83

NOTE — The number of flutes is optional.

TABLE 3 DIMENSIONS FOR MULTIPLE SADDLES

(Clause 5.1)

All dimensions in millimetres.

Material — Mild steel

SIZE OF CONDUIT	A* (Min)	B (Min)	C (Min)	D (Min)	E	F†	G (Min)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
16		16	16	0.71	4	15	10
20		20	19	0.9	4	20	10
25		25	19	0.9	4	20	10
32		32	22	1.25	5	25	10
40		40	22	1.25	5	25	10
50		50	22	1.25	5	25	10
63		63	22	1.25	5	25	10

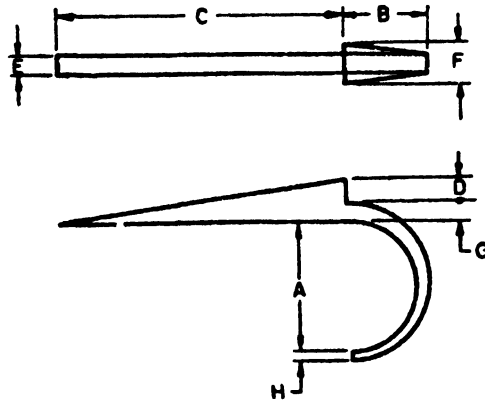
*Size of conduit \times No. of conduits plus 1 mm.

†Width of saddle.

TABLE 4 DIMENSIONS FOR PIPE HOOKS AND CRAMPETS
(Clause 5.1)

All dimensions in millimetres.

Material — Mild steel forgings

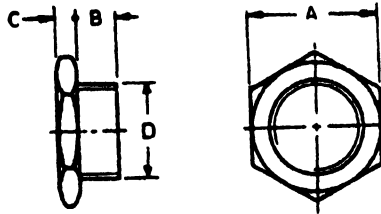


SIZE OF CONDUIT	A (Min)	B	C	D (Min)	E (Min)	F (Min)	G (Min)	H (Min)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
16	16	11	45	6.5	3.0	6.5	3.0	1.5
20	20	16	55	6.5	3.0	6.5	3.0	1.5
25	25	19	60	6.5	4.0	8.0	5.0	2.5
32	32	23	70	5.5	4.0	8.0	5.0	2.5
40	40	23	80	6.5	5.0	9.5	5.0	2.5
50	50	28	90	6.5	5.0	9.5	5.0	2.5
63	63	35	100	6.5	5.0	9.5	6.5	3.0

TABLE 5 DIMENSIONS FOR PLUGS
(Clause 5.1)

All dimensions in millimetres.

Material — Mild steel

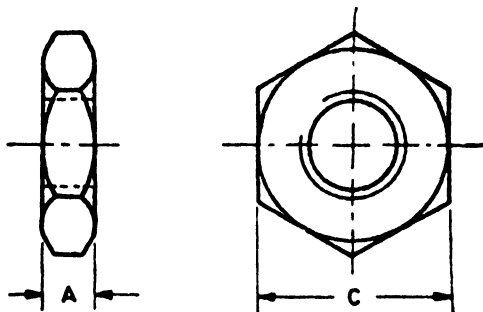


SIZE OF CONDUIT	<i>A</i> (<i>Max</i>)	<i>B</i> (<i>Min</i>)	<i>C</i> (<i>Min</i>)	<i>D</i> (<i>Nominal</i>)
(1)	(2)	(3)	(4)	(5)
16	17	8.0	3.2	16
20	22	8.0	3.2	20
25	27	9.5	3.2	25
32	36	11.0	4.0	32
40	41	11.0	5.6	40
50	50	12.5	6.4	50
63	65	14.0	6.0	63

TABLE 6 DIMENSIONS FOR LOCK NUTS

(Clause 5.1)

All dimensions in millimetres.

Material — Mild steelSIZE OF
CONDUITTHICKNESS
A
(Min)WIDTH ACROSS
FLAT
C
(Max)

(1)

(2)

(3)

16

4.8

22

20

6.4

27

25

6.4

36

32

6.4

41

40

7.9

50

50

9.5

65

63

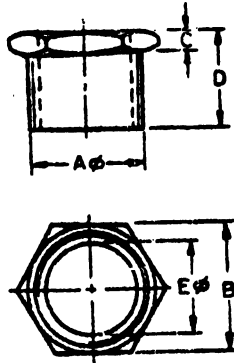
9.5

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**TABLE 7 DIMENSIONS FOR EXTERNALLY SCREWED
HEXAGONAL BUSHES**

(Clause 5.1)

All dimensions in millimetres.

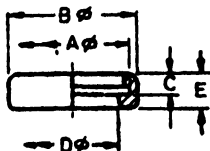
Material — Moulded insulating

SIZE OF BUSH A	WIDTH ACROSS FLATS B	THICKNESS OF HEXAGON C	LENGTH OVERALL D (Min)	BORE E
(1)	(2)	(3)	(4)	(5)
16	17	4.8	19	10.0
20	22	4.8	20	13.5
25	30	4.8	24	19.0
32	36	5.6	26	26.2
40	41	5.6	28	31.0
50	55	6.4	32	44.4

**TABLE 8 DIMENSIONS FOR INTERNALLY SCREWED
CIRCULAR BUSHES**

(Clause 5.1)

All dimensions in millimetres.

Material — Moulded insulating

SIZE OF BUSH A	EXTERNAL DIAMETER B	LENGTH OF THREAD C	BORE D	DEPTH OVERALL E
(1)	(2)	(3)	(4)	(5)
16	20	4.8	11.1	7.9
20	24	4.8	14.3	7.9
25	29	5.6	19.0	8.7
32	36	5.6	26.2	8.7
40	44	7.9	31.8	11.1
50	56	8.7	44.4	11.5

7.2 BIS Certification Marking

The product may also be marked with Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8. TESTS

8.0 General — The tests shall be made at the prevailing ambient temperature unless specified otherwise in the relevant clauses.

8.1 Samples and Criteria for Approval — The number of samples to be selected for tests specified in 8.2 to 8.4 and criteria for approval shall be in accordance with Appendix A.

8.2 Visual Examination — Each conduit accessory shall be examined visually for conformity with the requirements specified in 3.

8.3 Dimensional Check — Samples selected shall be tested for correctness of specified dimensions such as diameter and thickness. In addition, the accessories shall be tested for accuracy of screw threads by means of suitable gauges.

8.4 Test for Protective Coating — Samples selected shall be tested for protective coatings in accordance with 9.5.1 and 9.5.2 of IS : 1653-1972*. If the area available for this is less than 1 cm² this test shall be carried out on whatever maximum area is available.

APPENDIX A

(Clause 8.1)

SAMPLING OF ACCESSORIES FOR RIGID STEEL CONDUITS FOR ELECTRICAL WIRING

A-1. LOT

A-1.1 In any consignment, all the conduit accessories of the same type and size manufactured by the same factory and during the same period

*Specification for rigid steel conduits for electrical wiring (*second revision*).

shall be grouped together to constitute a lot. Each lot shall, however, consist of maximum of 1 000 of conduit fittings.

A-1.2 From each lot a certain number of conduits accessories as specified in Table 9 shall be selected at random and subjected to acceptance tests. For this purpose IS: 4905-1968* shall be used.

TABLE 9 SAMPLING SCHEME

LOT SIZE	FIRST STAGE N_1	SECOND STAGE N_2	$(N_1 + N_2)$	C_1	C_2
(1)	(2)	(3)	(4)	(5)	(6)
Up to 100	3	3	6	0	2
101 „ 300	8	8	16	0	2
301 „ 500	13	13	26	0	4
501 „ 1 000	20	20	40	1	5

A-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-2.1 In Table 9 ' N_1 ' is the size of the first stage sample. These samples shall be selected at random. A sample shall be declared defective if it fails in one or more of the acceptance tests. If the number of defectives found in this sample is less than or equal to C_1 , the lot shall be considered as conforming to this standard and accepted. If the number of defectives is greater than or equal to C_2 , the lot shall be rejected. If the number of defectives is between C_1 and C_2 , further sample of N_2 size shall be selected at random and subjected to acceptance tests.

A-2.1.1 If the number of defectives in the two samples combined is less than C_2 , the lot shall be accepted, otherwise rejected.

*Methods for random sampling.

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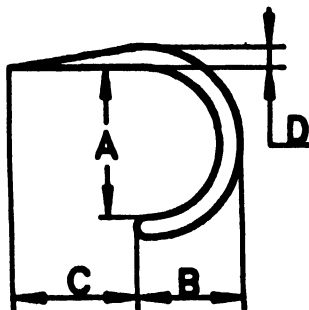
†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007 309 65 28

(First Revision)

1

Amend No. 1 to IS 3837 : 1976

(Page 10, Table 4) — Substitute the following for the existing figure:



(Page 11, Table 5, col 2) — Substitute the following for the existing:

'A
(Max)
22
26
31
38
46
56
69'

(Page 13, Table 7) — Insert the following note at the end of the table :

'NOTE — Externally screwed hexagonal bushes are meant for use of terminations of conduits in switch boxes.'

(Page 14, Table 8) — Insert the following note at the end of the table :

'NOTE — Internally screwed circular bushes are meant for use of termination of conduits in junction boxes.'

(ETD 14)