इंटरनेट मानक

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Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 14768-2 (2003): Conduit Fittings For Electrical Installations, Part 2: Metal Conduit Fittings (superseding IS 2667) [ETD 14: Electrical Wiring Accessories]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
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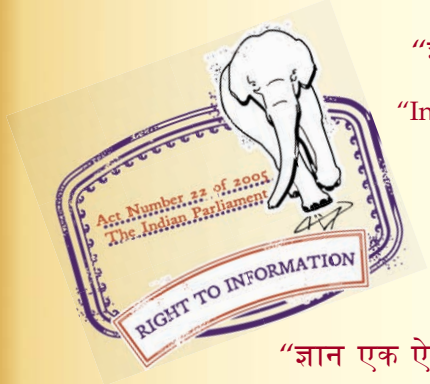

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 14768 (Part 2) : 2003
(Superseding IS 2667 : 1988)

भारतीय मानक

विद्युत संस्थापन के लिए नलिका फिटिंग — विशिष्टि

भाग 2 धातु कन्डयूट फिटिंग

Indian Standard

CONDUIT FITTINGS FOR ELECTRICAL INSTALLATIONS — SPECIFICATION

PART 2 METAL CONDUIT FITTINGS

ICS 29.120.10

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 2003

Price Group 4

Electrical Wiring Accessories Sectional Committee, ET 14

FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Wiring Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

Since many requirements and test methods relevant to different types of conduit fittings are similar, these have been covered in Part 1 of this standard with the intention of covering specific requirement of individual types of conduit fittings in subsequent parts. This standard (Part 2) is thus, one of this series.

This standard (Part 2) is to be read in conjunction with IS 14768 (Part 1) : 2000 'Conduit fittings for electrical installations: Part 1 General requirements' to which reference has been given regarding general requirements as well as test methods. Should, however, any deviations exists between IS 14768 (Part 1) and this standard, the provisions of the latter shall apply. Sequence of clauses used in this standard is the same as in IS 14768 (Part 1) for easy reference. Whenever particular requirement is not applicable to this type of conduits, the same has been indicated accordingly. Any addition to the existing provisions of a sub-clause of IS 14768 (Part 1) has been indicated as under:

Addition — Followed by the text of the additional matter.

Clauses/Tables which are additional to those of IS 9537 (Part 1) : 1980 'Conduit for electrical installations: Part 1 General requirements' are numbered starting from **101** and additional sub-clauses are numbered starting from **101** and additional sub-clauses are numbered with the main clauses number followed by **101, 102,** for example **7.101.**

With the publication of this standard (Part 2), IS 2667 : 1988 'Specification of fittings for rigid steel conduit for electrical wiring' shall be withdrawn since the requirements are covered in this standard (Part 2) which has been aligned with international practices.

This standard is based on corresponding IEC Publication 61035-2-1(1993) 'Specification for conduit fittings for electrical installations — Part 2 : Particular requirement — Section 1 Metal conduit fittings' issued by the International Electrotechnical Commission except for following modifications:

a) Schedule of type and acceptance test has been included, and

b) Sampling and criteria for compliance for acceptance test has been included.

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 or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CONDUIT FITTINGS FOR ELECTRICAL INSTALLATIONS — SPECIFICATION

PART 2 METAL CONDUIT FITTINGS

1 SCOPE

This clause of Part 1 is applicable except as follows:

Addition

This standard (Part 2) specifies requirements for metal conduit fittings, for use with circular, threadable or non-threadable conduits complying with IS 9537 (Part 2).

This standard is not applicable to fittings for use with flexible conduits covered in IS 9537 (Part 7).

2 REFERENCES

This clause of Part 1 is applicable except as follows:

Addition

IS No.	*Title*
2500 (Part 1) : 1992	Sampling inspection procedures: Part 1 Attribute sampling plan indexed by acceptable quality level (AQL) for lot by lot inspection (*second revision*)
9537	Conduits for electrical installations:
(Part 2) : 1981	Rigid steel conduits
(Part 7) : 2001	Rigid steel conduits flexible conduits
14763 : 2000	Conduits for electrical purposes, outside diameter of conduits for electrical installations and threads of conduits and fittings
14768 (Part 1) : 2000	Conduit fittings for electrical installations: Part 1 General requirements

3 TERMINOLOGY

This clause of Part 1 is applicable.

4 GENERAL REQUIREMENTS

This clause of Part 1 is applicable.

5 GENERAL CONDITIONS FOR TESTS

This clause of Part 1 is applicable except as follows:

5.4 Not applicable.

6 CLASSIFICATION

This clause of Part 1 is applicable except as follows:

6.1.2, 6.1.3, 6.3.1, 6.3.2, 6.5, 6.6, 6.7.3, 6.7.4 and 6.8.3 are not applicable.

7 MARKING

This clause of Part 1 inclusive of Annex A is applicable.

7.101 The conduit fittings may also be marked with the Standard Mark.

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

8 DIMENSIONS

This clause of Part 1 is applicable except as follows:

8.3 Addition

The dimensions and tolerance of conduit fittings shall be in accordance with Fig. 101 to Fig. 108.

For the bends specified in standard sheets [*see* **5.1** to **5.4** of IS 14768 (Part 1)], it shall be possible for the appropriate gauge to pass through the bend under its own weight and without any initial speed. The gauge specified in Fig. 4 of IS 9537 (Part 2) is used with a diameter *D* specified in Table 101.

Table 101 Gauges for Checking Minimum Inside Diameters of Bends

(*Clause* 8.3)

Size	Diameter, *D* mm		Tolerance mm
	Plain or Unthreaded	Threaded	
(1)	(2)	(3)	(4)
16	10.0	9.0	
20	14.0	13.0	
25	17.0	16.0	
32	20.0	20.0	± 0.02
40	25.0	25.0	
50	31.0	31.0	
63	40.0	40.0	

Threads for conduit fittings shall be checked by the gauges of Fig. 4 and Fig. 5 of IS 14763.

Requirements for tees and similar fittings are under consideration.

9 CONSTRUCTION

This clause of Part 1 is applicable.

10 MECHANICAL PROPERTIES

This clause of Part 1 is applicable.

11 RESISTANCE TO HEAT

This clause of Part 1 is not applicable.

12 RESISTANCE TO FLAME PROPAGATION

This clause of Part 1 is not applicable.

13 ELECTRICAL CHARACTERISTICS

This clause of Part 1 is applicable except as follows:

13.2, 13.3, 13.4, 13.5 and 13.6 are not applicable.

14 EXTERNAL INFLUENCES

This clause of Part 1 is applicable except as follows:

14.4 Not applicable.

15 TYPE TESTS ON JOINTS

This clause of Part 1 is applicable.

101 CLASSIFICATION OF TESTS

101.1 Type Tests

The following shall constitute the type tests:

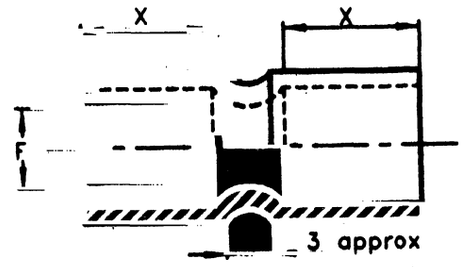
a) Checking of dimensions (*see* **8**),
b) Construction (*see* **9**),
c) Mechanical properties (*see* **10**),
d) Resistance to flame propagation (*see* **12**),
e) Electrical characteristics (*see* **13**),
f) External influences (*see* **14**), and
g) Tests on joints (*see* **15**).

101.2 Acceptance Tests

The following shall constitute the acceptance tests:

a) Checking of dimensions (*see* **8**),
b) Mechanical properties (*see* **10**),
c) Resistance to flame propagation burning (*see* **12**), and
d) Electrical characteristics (*see* **13**).

101.2.1 A recommended sampling plan for acceptance tests is given in Annex B.



Where a performance in accordance with 15 is not claimed, it shall be possible for the conduit to enter the fitting for at least *X* mm.

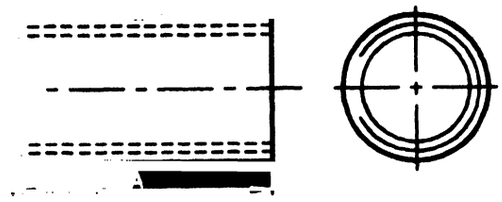
All dimensions in millimetres.

Size	*X, Min*	*X, Max*
16	25	14.5
20	25	18.5
25	25	23.5
32	25	30.5
40	35	38.5
50	35	48.5
63	35	61.5

Material: Metal

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 101 COUPLERS, NON-THREADED



Dimension *A* shall be such that the length of the thread allows compliance with the performance claimed when fitted with lengths of conduit in accordance with IS 9537 (Part 2).

All dimensions in millimetres.

Size
16
20
25
32
40
50
63

Material: Metal

Screw threads in accordance with IS 14763.

Couplers may have an integral device for clamping an earth continuity conductor of a maximum size of 16 mm^2.

The method of clamping shall be such as not to damage the conductor. Compliance shall be checked by inspection.

The illustration is not intended to govern design except for the dimensions shown.

FIG. 102 COUPLERS, INTERNALLY THREADED

AMENDMENT NO. 1 JUNE 2004
TO
IS 14768 (PART 2) : 2003 CONDUIT FITTINGS FOR ELECTRICAL INSTALLATIONS — SPECIFICATION
PART 2 METAL CONDUIT FITTINGS

(*Second cover page, para* 4, *line* 1) — Substitute 'IS 14768 (Part 1) : 2000' *for* 'IS 9537 (Part 1) : 1980 Conduit for electrical installations : Part 1 General requirements'.

(*Page* 1, *clause* 2 *Addition, col* 1, *Row* 3) — Substitute 'IS 9537 (Part 7) (Under preparation)' *for* 'IS 9537 (Part 7): 2001'.

(*Page* 1, *clause* 8.3, *para* 1, *line* 2) — Substitute 'Fig. 101 to Fig. 112' *for* 'Fig. 101 to Fig. 108'.

(*Page* 1, *clause* 8.3, *para* 2, *lines* 1 *and* 2) — Substitute '[*see* Fig. 105 to Fig. 108 of IS 14768 (Part 1)]' *for* ' [*see* 5.1 to 5.4 of IS 14768 (Part 1)]'.

(*Page* 2, *clause* 8.3, *last para*) — Delete.

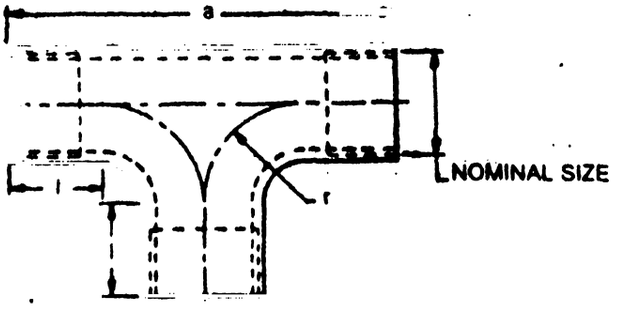
[*Page* 2, *clause* 101.1(d)] — Delete.

[*Para* 2, *clause* 101.2(c)] — Delete.

(*Page* 2, *Fig.* 101, *Table, col* 3, *heading*) — Substitute '*F, Max*' *for* '*X, Max*'.

(*Page* 7, *Fig.* 107, *Table, col* 3, *heading*) — Substitute '*B Min*' *for* '*B Max*'.

(*Page* 7, *Fig.* 108) — Insert the following figures after Fig. 108:



All dimensions in millimeters.

Nominal Size of Tee	*l*	*r*
16	32	16
20	40	20
25	50	25
32	64	32
40	80	40
50	100	50
63	126	63

NOTE — Dimension *a* will be twice the sum of dimensions *l* and *r*.

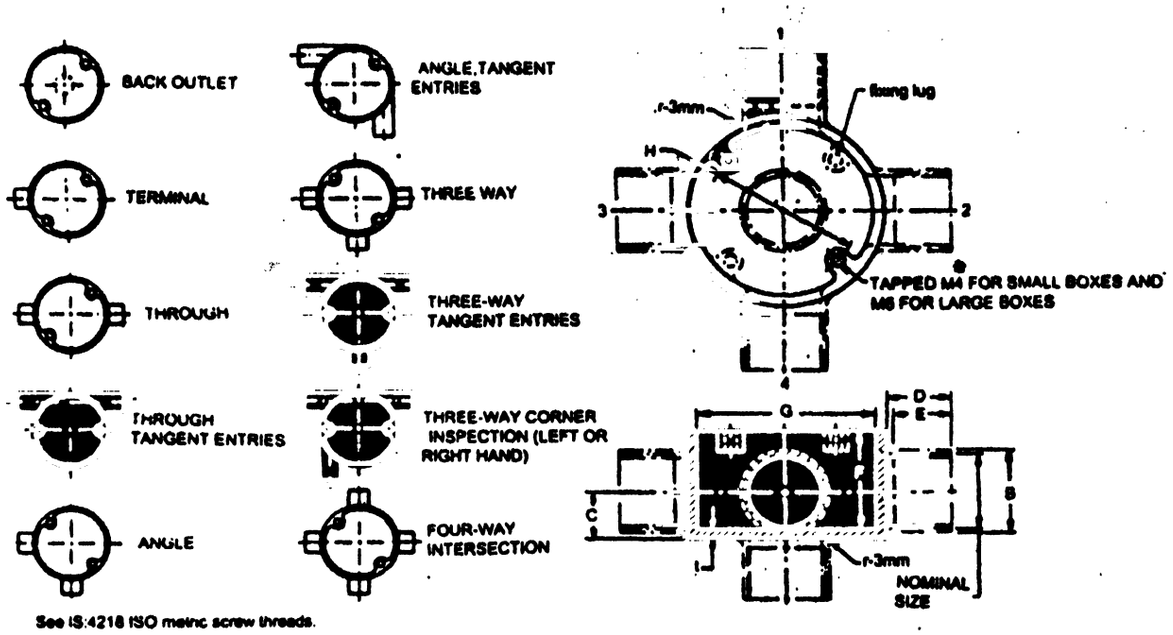
Material : Steel

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 109 TEES

Price Group 2



All dimensions in millimetres.

Dimensions of Small Circular Boxes

Size of Conduit	B	C	D	E	F	G	H	t
16	19.2	12.5	17.5	14.5 ± 1	28	60	50	1.6
20	23.2	14.5	20.0	17.0 ± 1	28	60	50	1.6
25	28.2	17.0	24	21.0 ± 1	31	60	50	1.6

Dimensions of Large Circular Boxes

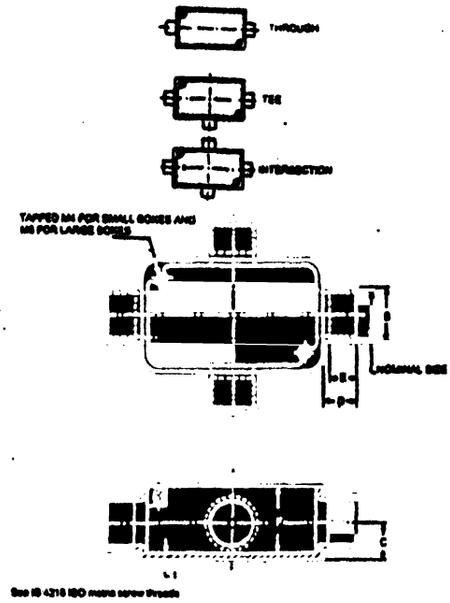
Size of Conduit	B	C	D	E	F	G	H	t
20	25	15.0	20	17 ± 1	35	80	70	2.5
25	30	17.5	24	21 ± 1	40	80	70	2.5
32	37	21.0	24	21 ± 1	40	80	70	2.5

Material : Steel

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 110 CIRCULAR BOXES



All dimensions in millimetres.

Preferred Internal Dimensions for Height, Length and Breadth of Rectangular Boxes

Height	Length	Breadth
37.5	75	75
	100	75
	100	100
	150	75
	150	100
	150	150
50.0	75	75
	100	75
	100	100
	150	75
	150	100
	150	150
75.0	100	100
	150	75
	150	100
	150	150
100.0	100	100
	150	150
150.0	100	100

Dimensions of Rectangular Boxes

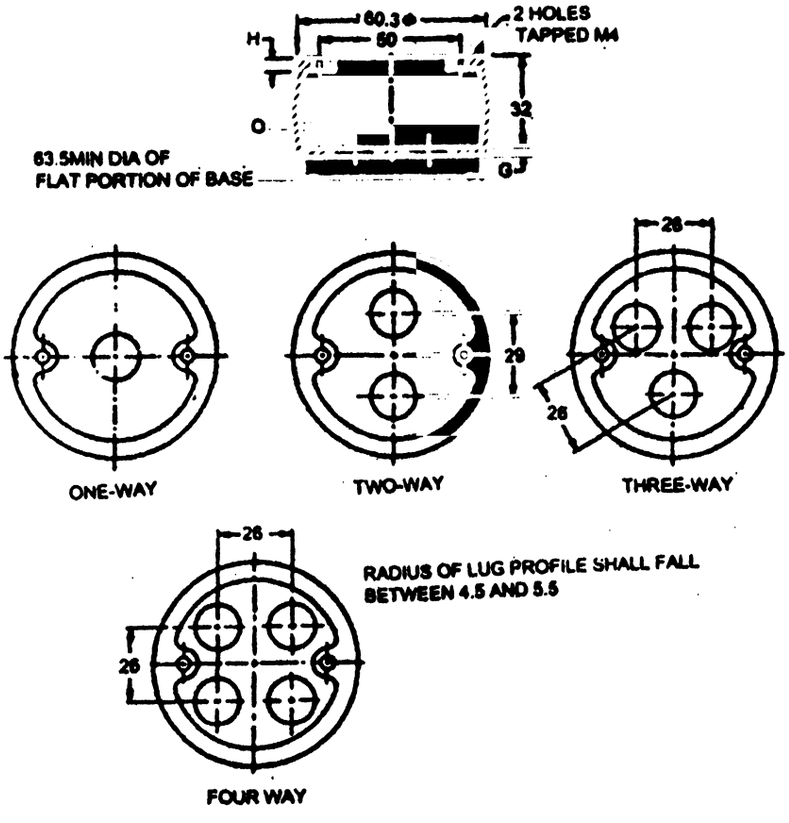
Size of Conduit	*B*	*C*	*D*	*E*	*t*
20	25	15.0	20	17 ± 1	1.6
25	30	17.5	24	21 ± 1	1.6
32	37	21.0	24	21 ± 1	1.6

Material: Steel

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 111 RECTANGULAR BOXES



All dimensions in millimetres.

Nominal Size	*G, Min*	*H, Min*
16	1.6	1.6
20	1.6	1.6

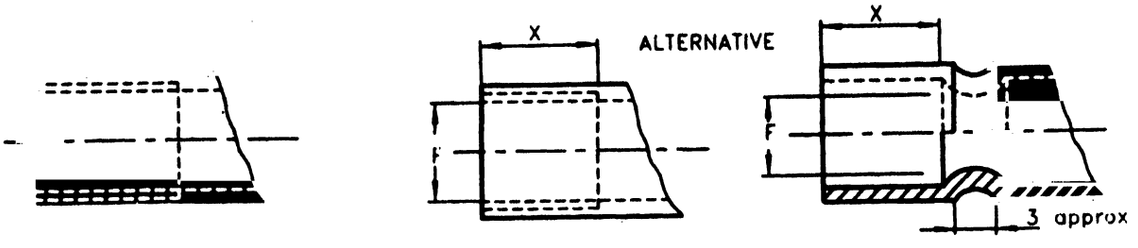
NOTE — The two- and three-way holes may be arranged to this pattern.

Material : Steel

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 112 CIRCULAR LOOPING BOXES



Dimensions and design of entries shall be such as, when tested, to allow compliance with the performance claimed when fitted with conduit according to IS 9537 (Part 2).

Where a performance in accordance with 15 is not claimed, it shall be possible for the conduit to enter the fitting for at least *X* mm. In a non-threaded entry.

All dimensions in millimetres.

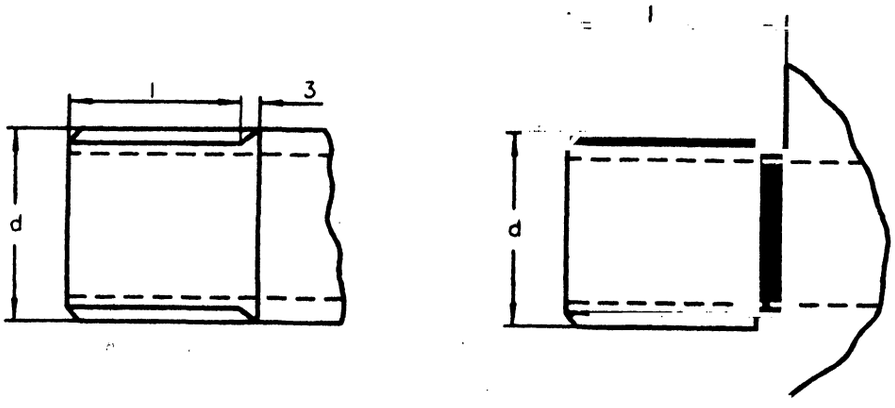
Size	*X, Min*	*F, Max*
16	25	14.5
20	25	18.5
25	25	23.5
32	25	30.5
40	35	38.5
50	35	48.5
63	35	61.5

Material: Metal

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 103 INTERNAL ENTRIES



The length of thread *d* shall be such as to allow compliance with the performance claimed when fitted with conduit in accordance with IS 9537 (Part 2).

All dimensions in millimetres.

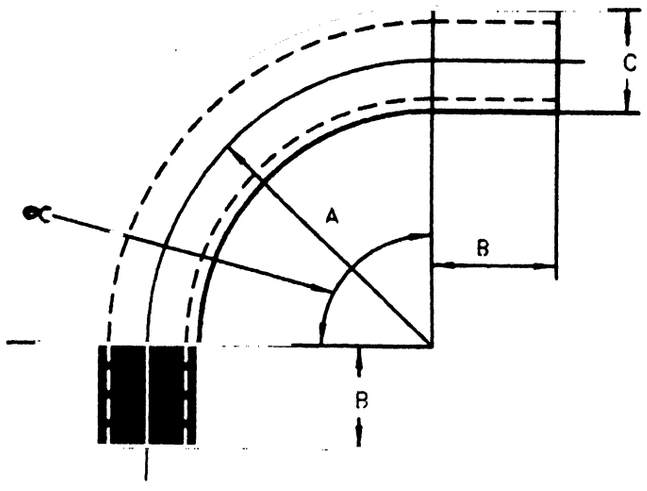
Size	*Diameter, d*	
	Max	*Min*
16	16.0	15.7
20	20.0	19.7
25	25.0	24.6
32	32.0	31.6
40	40.0	39.6
50	50.0	49.5
63	63.0	62.4

Material: Metal

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 104 ENTRIES EXTERNALLY THREADED



Preferred values of angle are 30°, 60° and 90°.

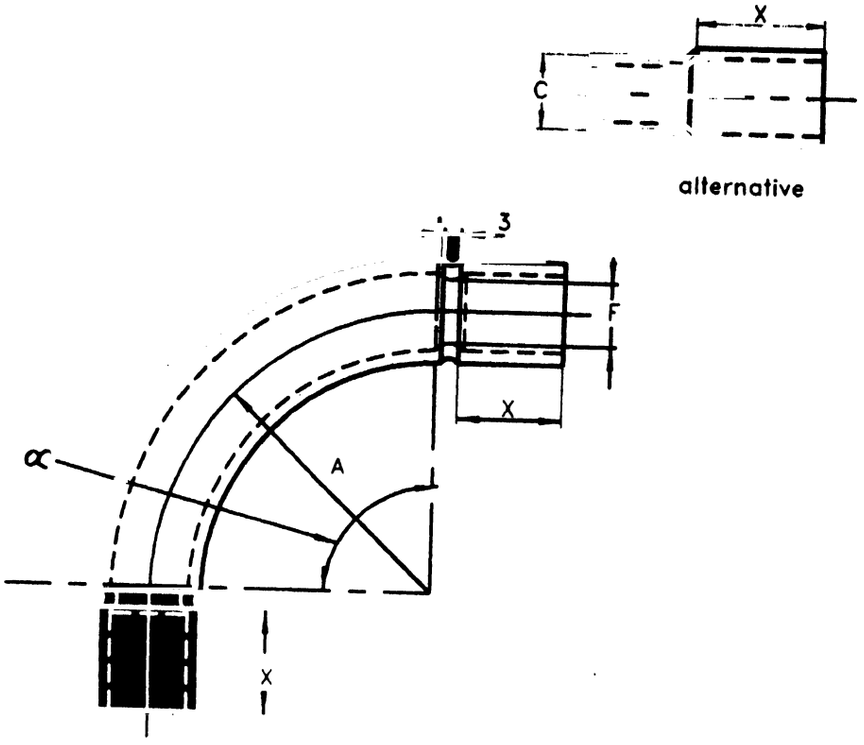
All dimensions in millimetres.

Size	*A, Radius* *Min*	*B* *Min*	*C, Diameter*	
			Max	*Min*
16	40	14	16.0	15.7
20	50	17	20.0	19.7
25	63	23	25.0	24.6
32	80	27	32.0	31.6
40	100	27	40.0	39.6
50	125	27	50.0	49.5
63	160	27	63.0	62.4

Material: Metal

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 105 PLAIN BENDS



Preferred values of angle are 30°, 60° and 90°.

Dimensions and design of entries shall be such as, when tested to allow compliance with the performance claimed when fitted with conduit according to IS 9537 (Part 2).

Where a performance in accordance with 15 is not claimed, it shall be possible for the conduit to enter the fitting for at least *X* mm.

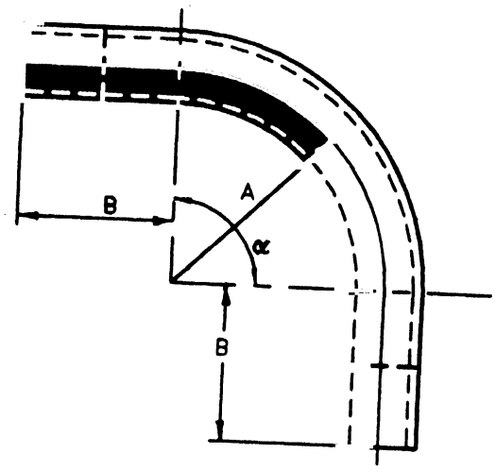
All dimensions in millimetres.

Size	*A, Radius*	*C, Diameter*		*F*	*X*
	Min	*Max*	*Min*	*Max*	*Min*
16	40	16.0	15.7	14.5	25
20	50	20.0	19.7	18.5	25
25	63	25.0	24.6	23.5	25
32	80	32.0	31.6	30.5	25
40	100	40.0	39.6	38.5	35
50	125	50.0	49.5	48.5	35
63	160	63.0	62.4	61.5	35

Material: Metal

The illustration is not intended to govern design, except for the dimensions shown.

FIG. 106 BENDS: NON-THREADED BENDS



Preferred values of angle are 30°, 60° and 90°.

The length of the thread shall be such as to allow compliance with the performance claimed when fitted with conduit in according to IS 9537 (Part 2).

All dimensions in millimetres.

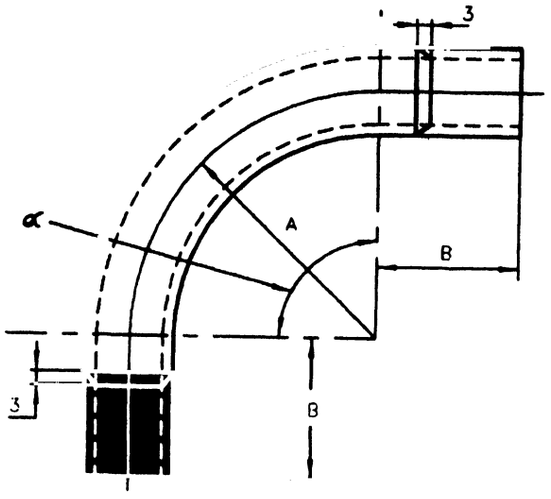
Size	*A, Radius* *Min*	*B* *Max*
16	40	15
20	50	15
25	63	18
32	80	20
40	100	25
50	125	25
63	160	25

Material: Metal

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design except for the dimensions shown.

FIG. 107 BENDS: INTERNALLY THREADED BENDS



Preferred values of angle are 30°, 60° and 90°.

The length of the thread shall be in accordance with standard sheet 2 of IS 9537 (Part 2).

All dimensions in millimetres.

Size	*A, Radius* *Min*	*B* *Min*
16	40	19
20	50	19
25	63	19
32	80	21
40	100	25
50	125	25
63	160	25

Material: Metal

Screw threads in accordance with IS 14763.

The illustration is not intended to govern design except for the dimensions shown.

FIG. 108 BENDS: EXTERNALLY THREADED BENDS

ANNEX A

(*Clause* 7)

CONDUIT FITTINGS MARKING — CLASSIFICATION CODE

This annex of Part 1 is applicable.

ANNEX B

(*Clause* 101.2.1)

SAMPLING AND CRITERIA FOR CONFORMITY

B-1 LOT

B-1.1 In any consignment, all the manufactured lengths of conduits of the same type and size manufactured by the same factory during the same period shall be grouped together to constitute a lot.

B-1.2 The number of conduits to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 3 of Table 102.

B-1.2.1 These conduits shall be selected from the lot at random. In order to ensure the randomness of selection, procedure given in IS 2500 (Part 1) : 1992 may be followed.

Table 102 Sample Size, Acceptance and Rejection Number

Sl No.	Lot Size	Stage of Sample	For Dimensional Requirements			For Other Acceptance Test		
			Sample Size	Acceptance No.	Rejection No.	Sample Size	Acceptance No.	Rejection No.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Up to 300	First	8	0	2	3	0	2
		Second	8	1	2	3	1	2
ii)	301 to 500	First	13	0	2	5	0	2
		Second	13	1	2	5	1	2
iii)	501 to 1 000	First	20	0	3	8	0	2
		Second	20	3	4	8	1	2
iv)	1 001 and above	First	32	1	5	13	0	3
		Second	32	4	4	13	3	4

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. ET 14 (5282).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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