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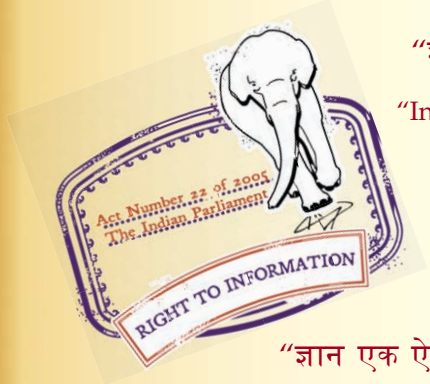
IS 2692 (1989): ferrules for water services [CED 3: Sanitary Appliances and Water Fittings]



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जल सेवा फेरूल – विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

FERRULES FOR WATER SERVICES — SPECIFICATION

(Second Revision)

First Reprint MARCH 1997

UDC 628.143 : 621.643.063.2

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

August 1990

Price Group 4

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 24 November 1989, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

Ferrules are commonly used in taking out branch lines from water mains and also in stopping supply to branch lines where so desired. Different types of ferrules are available to suit specific purposes. This standard was first issued in 1964 and first revised in 1978.

In this revision, material and dimensions specified for different parts of ferrules have been modified and hydraulic test pressure has been modified to 1·5 MPa.

This standard contains **7.3** and **7.5** which permit the purchaser to use his option for selection to suit his requirements.

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
FERRULES FOR WATER SERVICES — SPECIFICATION
(Second Revision)

1 SCOPE

1.1 This standard lays down nominal sizes and requirements regarding material, manufacture and workmanship, construction, sampling and testing of copper alloy screw-down ferrules for use on water supply mains.

2 REFERENCES

2.1 The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definition shall apply.

3.1 Ferrule

A draw-off appliance with a vertical inlet for screwing on to water main and a horizontal outlet, and closed by means of a washer plate carrying a renewable washer which shuts against the water pressure on a seating at right angles to the axis of the threaded plug which operates it.

4 NOMINAL SIZE

4.1 Ferrules shall be of the following nominal sizes:

8, 10, 15, 20, 25, 32, 40 and 50 mm

4.1.1 The nominal sizes of the ferrule shall be designated by the nominal bore of the inlet connection.

5 MATERIAL

5.1 Materials used for the manufacture of different parts of ferrules shall conform to Indian Standards given in col 4 in Table 1.

6 DIMENSIONS

6.1 Dimensions of different parts of ferrules shall be in accordance with Tables 2 and 3.

NOTE — The dimensions for 6 mm size ferrules shall be same as for 10 mm size except that the nominal bore at inlet shall be 8 mm.

7 MANUFACTURE AND WORKMANSHIP

7.1 All castings shall be sound, free from laps, blow holes and pittings; and both the external and internal surfaces shall be clean, smooth and free from sand. They shall be neatly dressed and no castings shall be burned, plugged, stopped or patched.

7.2 Bodies, plugs and other parts shall be truly machined so that when assembled the parts shall be axial, parallel and cylindrical, with surfaces smoothly finished

8 CONSTRUCTION

8.1 Illustration of a typical ferrule is given in Fig. 1.

NOTE — The shape of the component parts are only illustrative but the dimensions and minimum requirements where specified are binding

8.2 Waterway

Except at the bore of the seating, the area of waterway throughout the body of the ferrule shall not be less than the area of a circle of diameter at inlet.

8.3 Body

A hexagonal shoulder shall be provided on the outlet end of the body, dimensions of which shall correspond to the size of spanners. A hexagonal shoulder may also be provided at the inlet end of the body, if so desired by the purchaser.

8.4 Seating

The seating of a ferrule shall be integral with the body. Both arises shall be rounded to a radius of 0·2 to 0·5 mm according to the size of the ferrule.

8.5 Key

The key shall be fabricated out of a round malleable casting or forged mild steel bar and shall be in the form of 'T' as illustrated in Fig. 2. One end of the 'T' shall be in the form of a ring having a square slot to suit the square head of the ferrule cap and the other end shall be plain.

Table 1 Materials for Different Parts of Ferrules

(*Clause* 5.1)

Sl No.	Component	Material	Conforming to
(1)	(2)	(3)	(4)
i)	Body, plug and cap	Leaded tin bronze	Grade LTB 2 of IS 318 : 1981
ii)	Washer plate and nut	Brass (extruded, rolled, cast, diecast)	Type I Half hard of IS 319 : 1974
			Grade DCB 2 of IS 1264 : 1989
			HT 2 of IS 320 : 1980
		Leaded brass	Grade FLB of IS 6912 : 1985
iii)	Resilient washer	Leather	IS 4346 : 1982
		Vulcanized fibre	—
		Rubber	—
iv)	Copper washer	Copper	IS 3487 : 1966

The third branch of 'T' shall have a square tapered end suitable for insertion into the square recess on the plug head and shall be of length as given in Fig. 2.

NOTE — The purchaser shall specify whether keys are required and if so, their number.

8.6 Plug

Plug shall be circular in cross section and shall be provided with a parallel central hole on the underside for the stem of the washer plate and a square recess on the head for inserting the plug key.

8.7 Washer Plate

The washer plate with its stem shall be made in one or two pieces, true all over, especially on the face on which the washer will be seated.

8.7.1 The washer plate shall be free to rotate and slide in the hole on the underside of the plug, and the stem shall be clear from the hole end.

8.7.2 In the fully open position, the vertical lift of the washer plate above the seating shall be such that the washer does not come in contact with the wall of the body.

8.7.3 Washer plate shall have a stud for attaching the washer. The stud shall be threaded and provided with a nut.

8.8 Screw Threads

All the screw threads other than inlet and outlet connection threads shall conform to the basic profile or ISO metric screw threads as given in IS 4218 (Parts I to IV) : 1976. The inlet and outlet connection shall have taper threads conforming to IS 554 : 1975.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 The sampling procedure and criteria for conformity shall be as given in Annex B.

10 TESTING

10.1 Every ferrule, complete with its component parts, shall withstand a hydraulic pressure of at least 1·5 MPa, applied for two minutes, and during this period it shall neither leak nor sweat.

11 MARKING

11.1 Each ferrule shall be legibly marked with the following information:

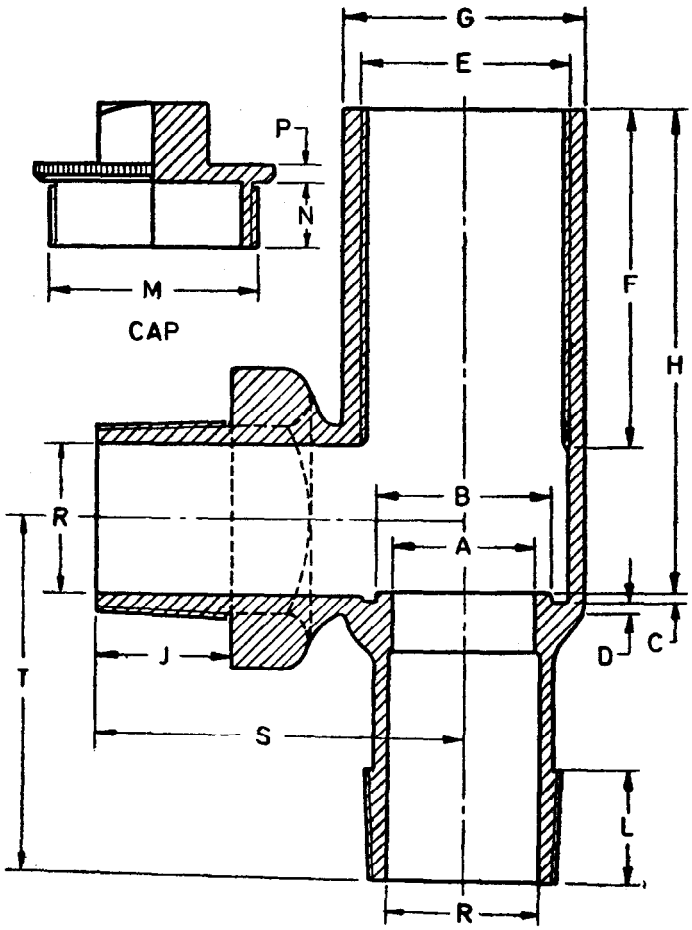
a) Indication of the source of manufacture, and

b) Nominal size.

Table 2 Dimensions of Body and Cap

(*Clause* 6.1)

All dimensions in millimetres.



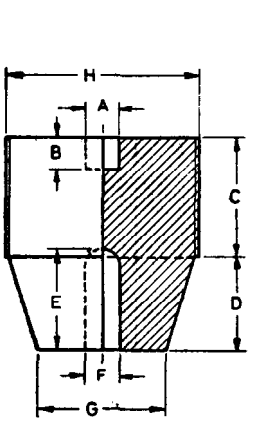
Sl No.	Particulars	Dimensions for Nominal Size													
		10		15		20		25		32		40		50	
		Max	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	Bore of seating, *A*	9·6	9·4	12·9	12·6	19·1	18·8	25·2	24·8	32·1	31·7	38·3	37·9	50·2	49·8
ii)	Outside diameter of seating, *B*	—	14·7	—	17·9	—	24·2	—	32·0	—	38·7	—	46·2	—	62·5
iii)	Height of seating, *C*	—	1·6	—	1·6	—	1·6	—	2·4	—	2·4	—	2·4	—	2·4
iv)	Thickness of walls not threaded and metal supporting the seat, *D*	—	1·9	—	1·9	—	1·9	—	2·7	—	3·1	—	3·1	—	3·9
v)	Major diameter of internal thread on body, *E*	M24 × 1·5		M24 × 1·5		M30 × 1·5		M39 × 1·5		M48 × 1·5		M56 × 1·5		M72 × 1·5	
vi)	Length of internal thread on body, *F*	—	45·0	—	46·0	—	46·0	—	54·0	—	61·0	—	74·0	—	90·0
vii)	Diameter of face of body, *G*	—	28·0	—	30·5	—	38·1	—	48·4	—	55·9	—	64·2	—	80·9
viii)	Face of body to face of seating, *H*	—	54·0	—	59·5	—	65·0	—	81·0	—	97·0	—	112	—	130·0
ix)	Length of external thread including undercuts, *J*	—	17·0	—	19·0	—	20·0	—	25·0	—	30·0	—	35·0	—	45·0
x)	Length of screwed shank including undercuts, *L*	—	25·0	—	25·0	—	25·0	—	30·0	—	35·0	—	40·0	—	50·0
xi)	Major diameter of external thread on cap, *M*	M24 × 1·5		M24 × 1·5		M30 × 1·5		M39 × 1·5		M48 × 1·5		M56 × 1·5		M72 × 1·5	
xii)	Length of external thread on cap, *N*	—	9·5	—	11·1	—	12·7	—	15·9	—	15·9	—	17·5	—	17·5
xiii)	Thickness of flange of cap, *P*	—	2·8	—	2·8	—	3·2	—	3·6	—	4·0	—	4·0	—	4·0
xiv)	Bore at ends, *R*	—	8·8	—	12·3	—	17·8	—	24·5	—	30·8	—	36·8	—	46·8
xv)	Centre of inlet to outlet end, *S*	—	50·0	—	55·0	—	60·0	—	70·0	—	85·0	—	95·0	—	115·0
xvi)	Centre of outlet to inlet end, *T*	—	55·0	—	60·0	—	65·0	—	75·0	—	90·0	—	100·0	—	120·0

NOTE — The screw thread *E* shall have nut tolerances of medium class and the thread *M* shall have bolt tolerances of medium class.

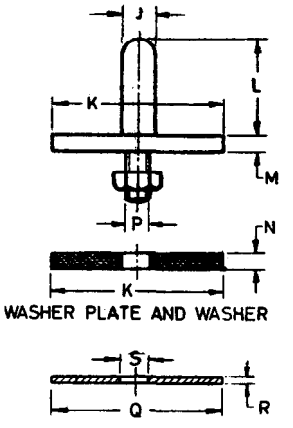
Table 3 Dimensions of Plug, Washer Plate and Washer

(*Clause* 6.1)

All dimensions in milimetres.



PLUG



WASHER PLATE AND WASHER

COPPER WASHER

Sl No.	Particulars	Dimensions for Nominal Size													
		10		15		20		25		32		40		50	
		Max	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	Size across flats of square recess on the plug head, *A*	—	7·0	—	7·0	—	8·0	—	9·0	—	10·0	—	11·0	—	12·0
ii)	Depth of square recess on the plug head, *B*	—	5·0	—	5·0	—	6·0	—	6·0	—	10·0	—	11·0	—	12·0
iii)	Length of external thread on plug, *C*	—	21·0	—	21·0	—	22·0	—	27·0	—	33·0	—	38·0	—	44·0
iv)	Length of the plain portion of plug, *D*	—	10·0	—	10·0	—	10·0	—	16·0	—	22·0	—	29·0	—	35·0
v)	Depth of parallel hole in plug (for stem of washer plate), *E*	18·8	17·9	18·8	17·9	20·4	19·5	24·3	23·5	28·7	27·1	32·0	30·4	40·1	38·5
vi)	Diameter of parallel hole in plug (for stem of washer plate), *F*	—	4·9	—	5·7	—	6·5	—	7·3	—	8·2	—	8·9	—	13·2
vii)	Diameter of plain portion of plug, *G*	—	15·8	—	15·8	—	20·6	—	22·5	—	34·9	—	41·2	—	47·7
viii)	Size of external thread on plug, *H*	M24 × 1·5		M24 × 1·5		M30 × 1·5		M39 × 1·5		M48 × 1·5		M56 × 1·5		M72 × 1·5	
ix)	Diameter of stem of washer plate, *J*	4·8	—	5·6	—	6·4	—	7·2	—	7·9	—	8·7	—	12·7	—
x)	Outside diameter of washer plate, *K*	—	15·9	—	19·0	—	25·4	—	33·3	—	40·1	—	47·7	—	63·5
xi)	Length of washer plate stem, *L*	16·3	15·5	16·3	15·5	17·8	17·1	21·9	21·1	25·5	24·0	28·8	27·2	36·9	35·9
xii)	Thickness of washer plate, *M*	—	3·2	—	3·2	—	4·0	—	4·0	—	4·3	—	5·5	—	6·3
xiii)	Thickness of rubber or leather washer (when new), *N*	—	4·0	—	4·0	—	4·0	—	4·7	—	4·7	—	6·3	—	6·3
xiv)	Core dia, *P*	—	3·2	—	4·1	—	4·9	—	4·9	—	5·9	—	6·6	—	8·3
xv)	Lift of washer plate (with washer in position)	—	4·2	—	4·6	—	5·7	—	7·0	—	9·5	—	10·8	—	14·2
xvi)	Outside diameter of copper washer, *Q*	—	7·0	—	10·0	—	15·0	—	20·0	—	24·0	—	30·0	—	42·0
xvii)	Thickness of copper washer, *R*	—	1·5	—	1·5	—	1·5	—	2·0	—	2·0	—	2·0	—	2·0
xviii)	Inside diameter of copper washer, *S*	—	4·5	—	5·5	—	6·5	—	6·5	—	7·5	—	8·5	—	10·5

NOTES

1 The screw thread *H* and *P* shall have bolt tolerances of medium class.

2 Stem of washer plate should fit smoothly in the plug.

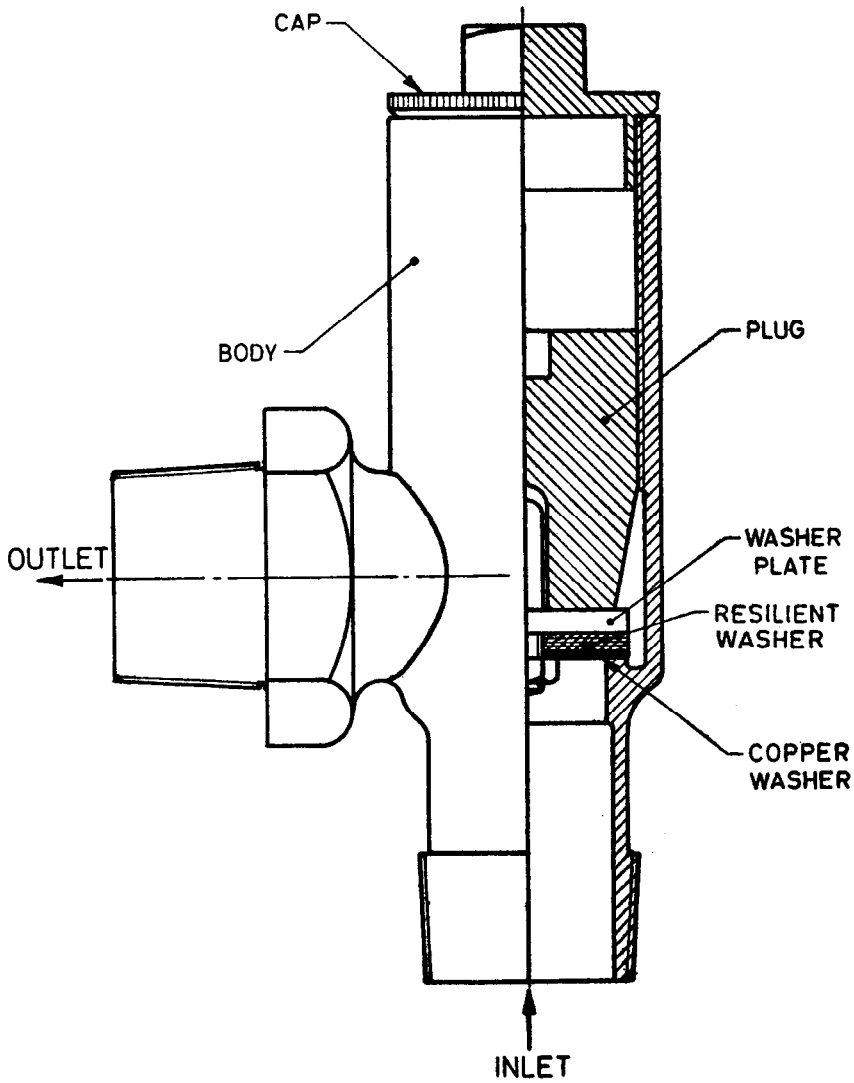
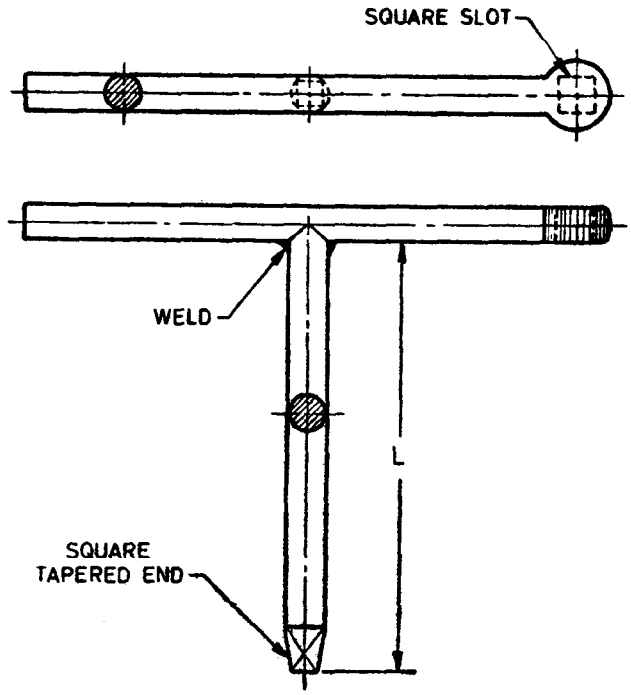


FIG. 1 ILLUSTRATION OF A TYPICAL FERRULE



Nominal size of Ferrule, mm	10	15	20	25	32	40	50
Length of 'T' Branch *L Min*, mm	90	115	140	165	190	215	240

FIG. 2 TYPICAL SKETCH OF KEY

ANNEX A

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
318 : 1981	Leaded tin bronze ingots and castings (*second revision*)	4218 (Part 1) : 1976	ISO metric screw threads Part 1 Basic and design profiles (*first revision*)
319 : 1974	Free-cutting brass, bars, rods and sections (*third revision*)	(Part 2) : 1975	Part 2 Diameter pitch combinations (*first revision*)
320 : 1980	High tensile brass rods and sections (other than forgings stock) (*second revision*)	(Part 3) : 1976	Part 3 Basic dimensions for profiles (*first revision*)
554 : 1985	Dimensions for pipe threads where pressure-tight joints are made on threads (*third revision*)	(Part 4) : 1976	Part 4 Tolerancing system (*first revision*)
1264 : 1989	Brass gravity die castings ingots and castings (*third revision*)	4346 : 1982	Washers for use with fittings for water services (*first revision*)
3487 : 1966	Copper strip and foil for manufacture of copper gaskets and copper washers and eyelets	4905 : 1968	Methods for random sampling
		6912 : 1985	Copper and copper alloys forging stock and forgings (*first revision*)

ANNEX B

(*Clause* 9.1)

SAMPLING AND CRITERIA FOR CONFORMITY

B-1 SAMPLING

B-1.1 Lot

In any consignment all the ferrules made of the same material and of the same nominal size, from the same batch of manufacture shall be grouped together to constitute a lot.

B-1.1.1 Samples shall be selected and tested from each lot separately to determine conformity or otherwise of the lot to the requirements of this specification.

B-1.2 The number of ferrules to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 4.

Table 4 Sample Size and Criteria for Conformity

(*Clauses* B-1.2, B-2.1, B-2.1.1 *and* B-3.2)

Lot Size	Sample Size	Permissible Number of Defectives	Sub-sample Size
(1)	(2)	(3)	(4)
Up to 150	8	0	3
151 to 300	13	0	5
301 to 500	20	1	8
501 to 1 000	32	2	13
1 001 to 3 000	50	3	20
3 001 and above	80	5	32

B-1.3 The ferrules for the sample shall be selected from the lot. For ensuring randomness of selection, procedures given in IS 4905 : 1968 shall be followed.

B-2 NUMBER OF TESTS

B-2.1 All the ferrules in the sample selected in accordance with col 2 of Table 4 shall be examined for material, workmanship, construction, finish, dimensions and minimum finished mass.

B-2.1.1 The number of ferrules to be tested for hydraulic pressure test shall be in accordance with col 4 of Table 4. This sub-sample shall be selected from those ferrules which have been already examined under **B-2.1** and have been found conforming to the requirements of this standard listed in **B-2.1.**

B-3 CRITERIA FOR CONFORMITY

B-3.1 The lot shall be considered conforming to the requirements of this standard if the conditions given in **B-3.2** and **B-3.3** are satisfied.

B-3.2 The number of ferrules failing to satisfy the requirements for one or more of the characteristics mentioned in **B-2.1** shall not exceed the corresponding number given in col 3 of Table 4.

B-3.3 No ferrule in the sub-sample shall fail in hydraulic test (*see* **10.1**).

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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 Handbook' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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AMENDMENT NO. 1 FEBRUARY 1992
TO
IS 2692 : 1989 FERRULES FOR WATER SERVICES — SPECIFICATON

(Second Revision)

(*Page* 1, *clause* 6.1, *Note, line* 1) — Substitute '8 mm' *for* '6 mm'.

(*Page* 4, *Table* 3) :

a) *Sl No.* (i), *col* 3, 5, 7, 9, 11, 13 *and* 15 — Substitute '9.0, 9.0, 10.0, 11.0, 12.0, 13.0 and 14.0' respectively for all '-'.

b) *Sl No.* (ii), *col* 3, 5, 7, 9, 11, 13 *and* 15 — Substitute '7.0, 7.0, 8.0, 8.0, 12.0, 13.0 and 14.0' respectively for all '-'.

(CED 3)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 AUGUST 2003
TO
IS 2692 : 1989 FERRULES FOR WATER SERVICES – SPECIFICATION

(Second Revision)

[*Page* 2, *Table* 1, *Sl No.* (iv), *col* 4] — Substitute 'IS 14811' *for* 'IS 3487 : 1996'.

(*Page* 6, *Annex* A) — Delete 'IS 3487:1966 Copper strip and foil for manufacture of copper gaskets and copper washers and eyelets'.

(*Page* 6, *Annex* A) — Insert 'IS 14811 : 2000 Rolled copper plate, sheet, strip and foils for general engineering purposes — Specification' at the end.

(CED 3)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 DECEMBER 2005
TO
IS 2692 : 1989 FERRULES FOR WATER SERVICES — SPECIFICATION

(Second Revision)

[*Page* 2, *Table* 1, *col* 2, *Sl No.* (iv)] — Delete 'Copper'.

[*Page* 2, *Table* 1, *col* 3, *Sl No.* (iv)] — Insert 'Brass' under 'Copper'.

[*Page* 2, *Table* 1, *col* 4, *Sl No.* (iv) (*see also Amendment No.* 2)] — Insert 'IS 410' under 'IS 14811'.

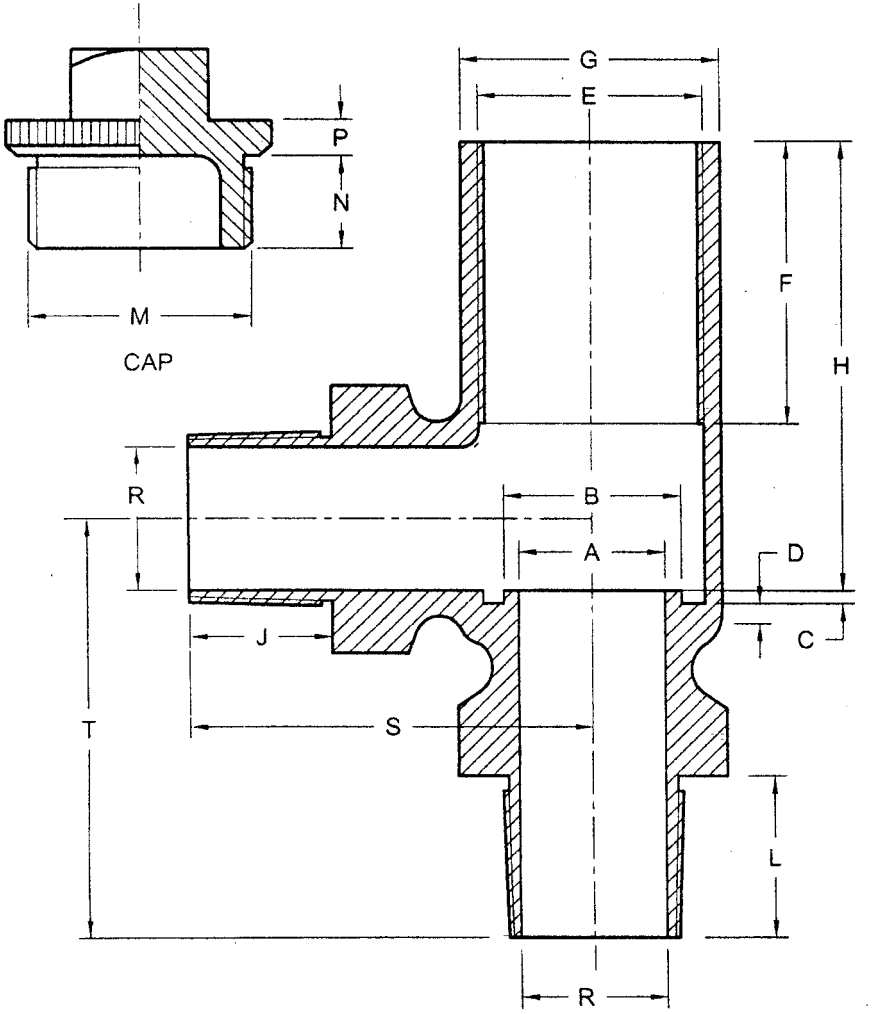
[*Page* 3, *Table* 2, *Sl No.* (i), *col* 3, 5, 7, 9, 11,13 *and* 15] — Delete the existing values and insert '–'.

[*Page* 3, *Table* 2, *Sl No.* (i), *col* 4, 6, 8, 10, 12, 14 *and* 16] — Substitute 8.8, 12.3, 17.8, 24.5, 30.8, 36.8 and 46.8 respectively for the existing values.

[*Page* 3, *Table* 2, *Sl No.* (vi), *col* 4, 6, 8, 10, 12, 14 *and* 16] — Substitute 43.0, 44.0, 44.0, 51.0, 56.0, 66.0 and 80.0 respectively for the existing values.

[*Page* 3, *Table* 2, *Sl No.* (viii), *col* 4, 6, 8, 10, 12, 14 *and* 16] — Substitute 52.0, 57.0, 63.0, 78.0, 92.0, 104.0 and 120.0 respectively for the existing values.

(*Page* 3, *Table* 2) — Substitute the following for the existing figure:



[*Page* 4, *Table* 3, *Sl No.* (iii), *col* 4, 6, 8, 10, 12, 14 *and* 16] — Substitute 19.0, 19.0, 20.0, 24.0. 28.0, 30.0 and 35.0 respectively for the existing values.

(*Page* 5, *Fig.* 1) — Substitute the following for the existing:

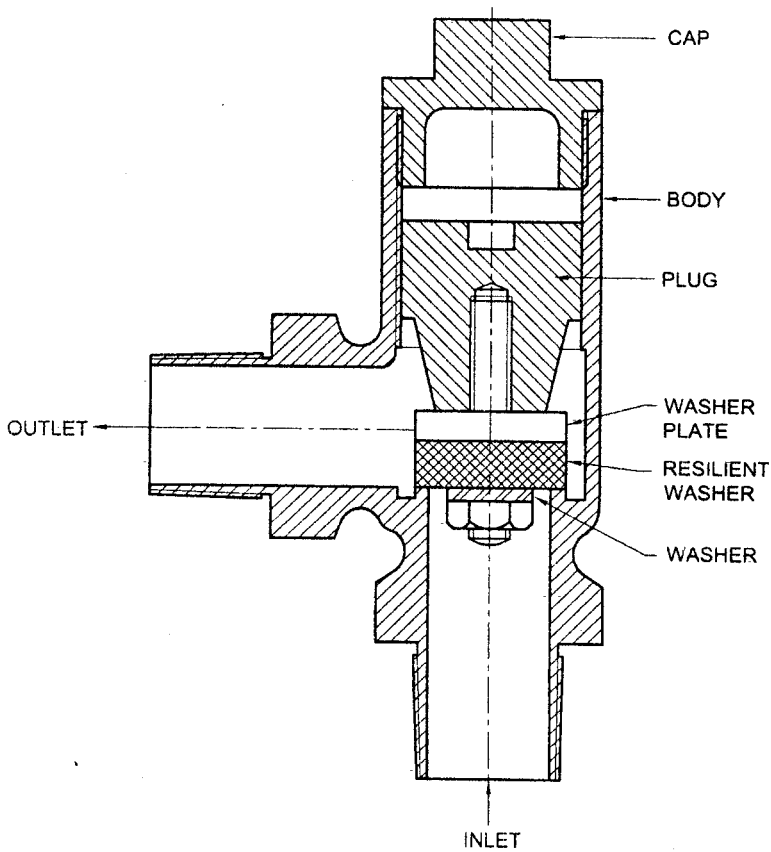


FIG. 1 ILLUSTRATION OF A TYPICAL FERRULE

(*Page* 6, *Annex* A) — Insert `IS 410 : 1977 Cold rolled brass sheet, strip and foil (*third revision*)' at the end.

(CED 3)

Reprography Unit, BIS, New Delhi, India