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SPECIFICATION FOR PLUG COCKS FOR WATER SUPPLY PURPOSES

(First Revision)

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Indian Standard

SPECIFICATION FOR PLUG COCKS FOR WATER SUPPLY PURPOSES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 28 February 1979, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 This standard was first published in 1964. In this revision dimensions have been modified to keep the area of flow through the plug port same as that of the body. The maximum working pressure for which plug cocks are suitable has also been incorporated as 1 MPa.

0.3 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers plug cocks of 15 mm, 20 mm and 25 mm nominal size with a key head for use underground for water supply purposes upto 1 MPa working pressure.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Plug Cock — It is a shut-off device comprising a body having a taper seating into which is fitted a plug which can be turned to move its port relative to the body ports to control the flow of water. The plug is retained in the body by means of a washer, screw and nut at its smaller end.

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

3. TYPES OF END

3.1 Plug cocks shall have each body end suitable for one of the following types of joints:

a) Plain ends for lead (wiped) joint,
b) Socket end for capillary solder joint,
c) Union and tail piece for lead (wiped) joint,
d) Union and tail pipe for capillary solder joint, and
e) Union for copper tube compression joint.

3.1.1 Ends for (b), (d) and (e) shall be as agreed to between the manufacturer and the purchaser.

3.1.2 When ends are required to be suitable for mild steel tubing complying with IS : 1239 (Part I)-1973*, the purchaser shall provide the supplier the details of his requirements.

4. NOMINAL SIZE

4.1 Plug cocks shall be of the following sizes:

15 mm, 20 mm and 25 mm.

4.1.1 The nominal size of the plug cock shall be denoted by the nominal bores of the end ports in the body.

5. MATERIALS

5.1 The component parts of the plug cocks shall be of brass or leaded tin bronze conforming to the following Indian Standards:

a) Cast brass for bodies and components	Grade 3 of IS : 292-1961†
b) Leaded tin bronze for bodies and components	Grade 2 of IS : 318-1962‡
c) Brass rods for washers, plug nuts, union nuts and tail pipes	IS : 319-1974§

*Specification for mild steel tubes and tubulars and other wrought steel fittings: Part I Mild steel tubes (*third revision*).
†Specification for brass ingots and castings (*revised*).
‡Specification for leaded tin bronze ingots and castings (*revised*).
§Specification for free cutting brass bars, rods and sections (*third revision*).

6. MANUFACTURE AND WORKMANSHIP

6.1 Castings shall in all respects be sound, free from laps, blow holes and pitting; and both the external and internal surfaces shall be clean, smooth and free from sand and burrs. They shall be neatly dressed and no casting shall be burned, plugged, stopped or patched.

6.2 All components shall be sound and solid without laminations and shall be smooth and well finished, and parts not machined shall be within the specified limits of size.

6.3 The bodies, plugs and other components shall be machine finished as given in **6.3.1** and **6.3.2**.

6.3.1 The taper of the body and of the plug shall be fine machine finished or precision ground and the plug and body shall be lapped together to give full area contact surfaces. The contact surfaces of the body and washer and nut shall be fine machined or precision ground, flat and square to the axis of the plug.

6.3.2 The circular spigot on the plug to which the washer is fitted shall be machined with one flat 'D' and the screwed projection to the plug shall be such that the washer bears on the body contact surface by means of the nut to give any desired tightness to the plug, with due provision for wear.

7. CONSTRUCTION AND DIMENSIONS

7.1 Waterway

7.1.1 The area of the body ports and throat shall be not less than the area of a circle of a diameter equal to the nominal bore (*see* Table 1) and adjacent to the plug the waterway of the body port shall coincide with the plug port.

7.1.2 The dimensions of the plug ports shall be those specified in Table 1 read with Fig. 1.

7.1.3 Inside faces of the plug port shall be finished smooth, for easy flow of water and to reduce frictional losses in the ports.

7.2 Minimum Thickness — No undimensioned parts of the body of the plug cock shall be less in thickness than the following:

Nominal Size	*Minimum Thickness*
15 mm	3 mm
20 mm	3 mm
25 mm	4 mm

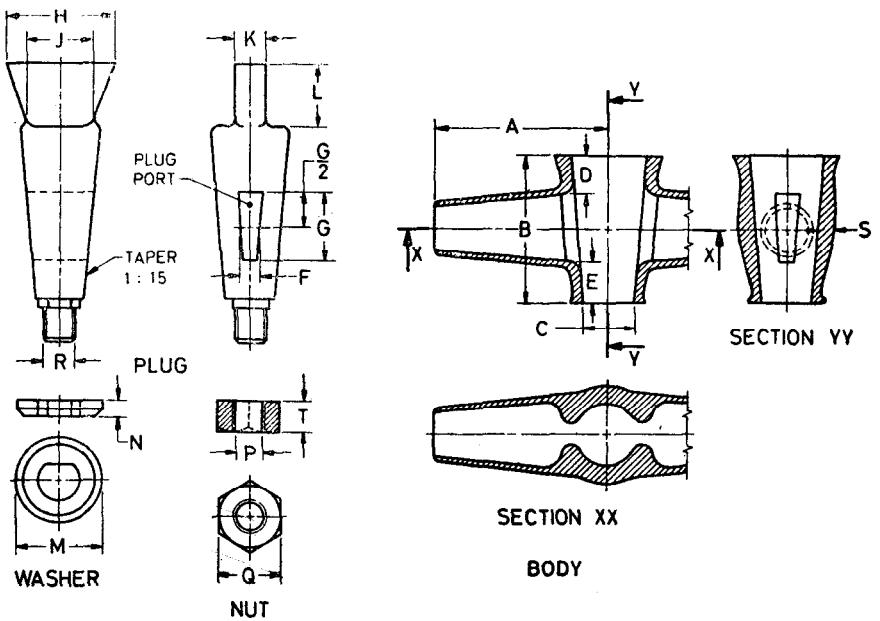

FIG. 1 PLUG COCK AND COMPONENT PARTS

7.2.1 The plug shall be solid except for the port.

7.3 Taper — The taper of the side of the plug and body shall be 1 in 15 (1 in 7·5 included angle).

7.4 Plug Cocks — The dimensions of the plug cocks shall be as given in Table 1 read with Fig. 1 and these dimensions shall be subject to the usual commercial tolerances for machined parts.

7.4.1 The larger end of the plug taper shall project $6 \pm 1{\cdot}5$ mm from the body.

7.5 Screw Thread — The thread on the projection at the smaller end of the plug, dimension *P* in Table 1, shall conform to the basic profile of ISO metric screw thread given in IS : 4218 (Part I)-1976*.

7.6 Washer — The dimensions of the washer shall be as given in Table 1.

*ISO metric screw threads: Part I Basic and design profile (*first revision*).

TABLE 1 DIMENSIONS OF COMPONENT PARTS OF PLUG COCKS

(*Clauses* 7.1.1, 7.1.2, 7.4, 7.5 and 7.6 and *Fig.* 1)

(All dimensions in millimetres)

NOMINAL SIZE	*A** (FOR LEAD)	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*J*	*K*	*L*	*M*	*N*	*P* (*see* Note 1)	*Q*	*R* (*see* Note 2)	*S*	*T*
15	72	50	18	12	12	7·5	24	35	20	10	22	27	5	M12 × 1·5	20	M12 × 1·5	5	10
20	75	68	22	20	20	11·0	29	40	25	10	25	33	5	M12 × 1·5	22	M12 × 1·5	6	12
25	80	80	25	22	22	14·5	35	45	28	10	27	40	5	M16 × 1·5	25	M16 × 1·5	7	14

NOTE 1 — Screw thread P-nut dimensions with tolerances of medium class as given in IS : 4218 (Part VI)-1967 'ISO metric screw threads: Part VI Limits of sizes for commercial bolts and nuts (diameter range 1 to 39 mm).'

NOTE 2 — Screw thread R-bolt dimensions with tolerance of medium class as given in IS : 4218 (Part VI)-1967.

*This length may be adjusted to suit other types of end.

8. FINISH OF BODY ENDS

8.1 The body ends of plug cocks when intended for direct plumbing to lead pipe shall be suitably finished by machining or grinding. The ends of all plug cocks shall have squared up faces to facilitate testing under pressure.

8.1.1 When the outlet has a union for lead, the nut and tail pipe shall comply with the requirements given in Table 2 read with Fig. 2. Unions of the cone type shall have the cone end machined or ground to a water-tight fit without the use of grummets, washers, plastic material or other jointing.

9. ASSEMBLY

9.1 All parts shall be effectively cleaned and the minimum quantity of a lubricant shall be applied to the seating surfaces of the body and plug to ensure smooth working.

10. HYDRAULIC TEST

10.1 Every plug cock complete with its component parts shall be tested for body and seat tests under internal hydraulic pressure of at least 2 MPa and 1 MPa respectively. The test pressure shall be maintained for a period of at least two minutes during which period it shall neither leak nor sweat.

11. MARKING

11.1 Every plug cock shall be legibly marked with the following information:

a) Manufacturer's name or trade-mark, and

b) Nominal size.

11.2 BIS Certification Marking

The product may also be marked with Standard Mark.

11.2.1 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.

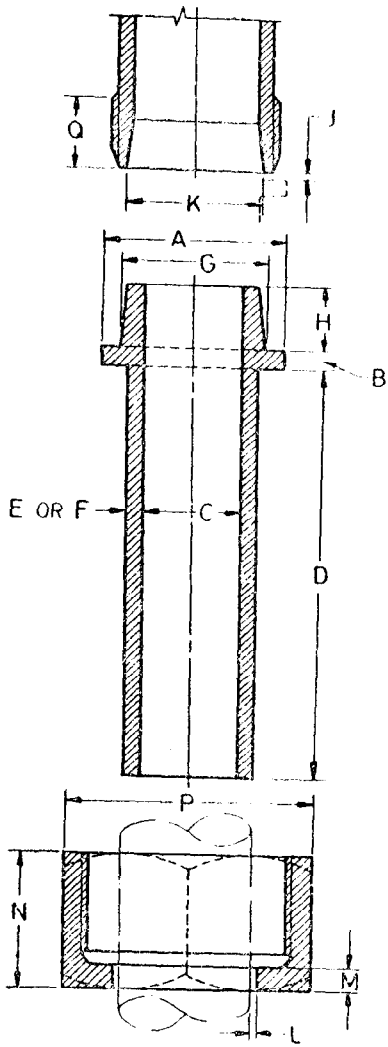

FIG. 2 STANDARD END, TAIL PIPE AND NUT

TABLE 2 DIMENSIONS FOR STANDARD TAIL PIPES AND NUTS

(*Clause* 8.1.1 and *Fig.* 2)

Sl No.	Particulars	Dimensions for Nominal Size of Plug Cock					
		15 mm		20 mm		25 mm	
		Max	*Min*	*Max*	*Min*	*Max*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		mm	mm	mm	mm	mm	mm
1.	Collar diameter, *A*	24	23	30	29	38·5	37 5
2.	Collar axial length, *B*	—	2·5	—	3	—	3·5
3.	Pipe bore, hot pressed and cast, *C*	—	13	—	20	—	25
4.	Pipe length from under collar to end, *D*	—	54	—	58	—	60
5.	Thickness of wall, hot pressed, *E*	—	1·5	—	1·8	—	2
6.	Thickness of wall, cast, *F*	—	2	—	2·2	—	2·4
7.	Cone, large end diameter, cone taper 9° (included angle 18°), *G*	19	—	26	—	37	—
8.	Cone axial length, *H*	—	8	—	8	—	9·5
9.	Cone (gap) face of collar to face of end, *J*	3	—	3	—	4	—
10.	Conical bore. Diameter of mouth in end of plug cock, *K*	—	18	—	25	—	36
11.	Coupling nuts, clearance over outside dia of pipe, *L*	0·8	—	0·8	—	0·9	—
12.	Coupling nuts, thickness of flange, *M*	—	3	—	3·5	—	4
13.	Coupling nuts, axial length, *N*	—	18	—	20	—	22
14.	Coupling nuts, size over flats of hexagon, *P*	—	31	—	38	—	46
15.	End of plug cock: Thread, Axial length *Q*	—	9·5	—	13	—	13
16.	Variation on thickness of tail pipe due to eccentricity	0·2	—	0·3	—	0·4	—

NOTE — Standard tail pipes and nuts specified above are suitable for parallel pipe threads of nominal size $\frac{3}{4}$, 1 and $1\frac{1}{4}$ mm respectively conforming to IS : 2643 (Part I)-1975 ' Dimensions of pipe threads for fastening purposes: Part I Basic profile and dimensions (*first revision*) '.

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