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IS 1701 (1960): mixing valves for ablutionary and domestic purposes [CED 3: Sanitary Appliances and Water Fittings]



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Indian Standard

SPECIFICATION FOR MIXING VALVES FOR ABLUTIONARY AND DOMESTIC PURPOSES

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

Indian Standard

SPECIFICATION FOR MIXING VALVES FOR ABLUTIONARY AND DOMESTIC PURPOSES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 October 1960, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Building Division Council.

0.2 Pipe fittings used on domestic plumbing systems are being manufactured indigenously in increasing number and this has necessitated laying down certain minimum requirements in regard to construction, performance and workmanship with a view to guiding both the manufacturers and the consumers. Standards covering some of the fittings have already been published and this standard covers mixing valves used for mixing hot and cold water for ablutionary and domestic purposes.

0.3 There are many designs of mixing valves and the illustration given in this standard is not intended to limit the design to any one type. The illustration is only indicative of general features and arrangements in a mixing valve and any type of design may be accepted provided the minimum requirements laid down in the specification are complied with.

0.4 The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of producers, consumers and technologists and has related the standard to the manufacturing and trade practices followed in the country in this field. Due weightage has also been given to the need for international co-ordination among standards prevailing in different countries of the world. These considerations led the Sectional Committee to derive assistance from B.S. 1415 : 1955 Mixing Valves (Manually Operated) for Ablutionary and Domestic Purposes, issued by the British Standards Institution.

0.5 This standard is one of a series of Indian Standard Specifications on sanitary appliances, water fittings and accessories. Other specifications published so far in the series are:

- *IS : 651-1955 SALT GLAZED STONEWARE PIPES AND FITTINGS
- IS : 771-1958 WHITE GLAZED EARTHENWARE SANITARY APPLIANCES

* Under revision.

IS : 772-1956 GENERAL REQUIREMENTS OF ENAMELLED CAST IRON SANITARY APPLIANCES

IS : 773-1956 ENAMELLED CAST IRON WATER CLOSETS, RAILWAY COACHING STOCK TYPE

*IS : 774-1957 FLUSHING CISTERNS FOR WATER CLOSETS AND URINALS

IS : 775-1956 BRACKETS AND SUPPORTS FOR LAVATORY BASINS AND SINKS

IS : 776-1957 WATER CLOSET SEATS AND COVERS

*IS : 778-1957 GUNMETAL GATE, GLOBE AND CHECK VALVES FOR WATER, STEAM AND OIL ONLY (NOT INTENDED FOR USE IN PETROLEUM INDUSTRY)

*IS : 779-1956 WATER METERS WITH THREADED END CONNECTIONS

*IS : 780-1959 SLUICE VALVES FOR WATER WORKS PURPOSES

IS : 781-1959 SAND-CAST BRASS SCREW-DOWN BIB TAPS AND STOP TAPS FOR WATER SERVICES

IS : 782-1957 CAULKING LEAD

0.6 This specification requires reference to the following Indian Standard Specifications:

IS : 292-1951 BRASS INGOTS AND CASTINGS

IS : 318-1952 LEADED TIN BRONZE INGOTS AND CASTINGS (*Tentative*)

IS : 319-1951 FREE CUTTING BRASS RODS AND BARS FOR USE IN SCREW MACHINES (*Tentative*)

IS : 554-1955 PIPE THREADS FOR GAS LIST TUBES AND SCREWED FITTINGS (*Tentative*)

IS : 1068-1958 COPPER, NICKEL AND CHROMIUM ELECTROPLATED COATINGS

0.6.1 Wherever a reference to any Indian Standard mentioned under **0.6** or otherwise appears in this specification, it shall be taken as a reference to the latest version of the standard.

0.7 Metric system has been adopted in India and all quantities and dimensions appearing in this standard have been given in this system. Non-metric values to which Industry has been accustomed are also given in brackets, where necessary, for the sake of smooth changeover by December 1966.

* Under revision.

0.8 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 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.

0.9 This standard is intended chiefly to cover the technical provisions relating to the manufacture and testing of mixing valves, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard lays down the requirements regarding sizes, material, manufacture, workmanship and testing of mixing valves for ablutionary and domestic purposes.

2. TERMINOLOGY

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

2.1 Mixing Valve — An appliance into which hot and cold water entering through separate valve ports are mixed in a specially formed chamber and then delivered through a single common outlet, the temperature of the mixed water being controlled through a nominal range by the operation of a single handle. Illustration of a typical mixing valve is given in Fig. 1 (*see also 0.3*).

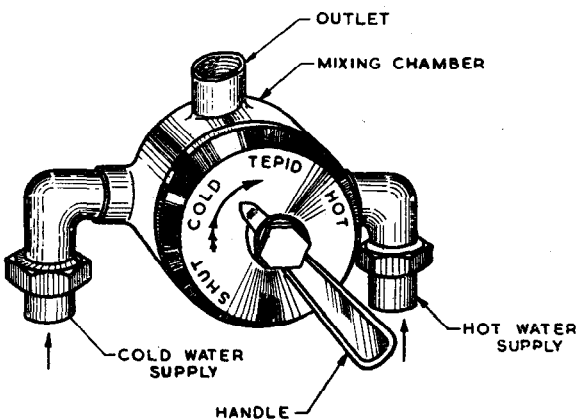


FIG. 1 MIXING VALVE

3. SIZES

3.1 Mixing valves shall be of three sizes, namely 15 mm (or $\frac{1}{2}$ in.), 20 mm (or $\frac{3}{4}$ in.) and 25 mm (or 1 in.).

3.2 The size of a mixing valve shall be denoted by the nominal size of the bore of the inlets which shall always be of equal diameters.

4. MATERIAL

4.1 The component parts shall be of brass, leaded tin bronze, stainless steel or other equally suitable

corrosion-resisting alloy; in case of hot pressings, manganese bronze may also be used. Where they are made of brass or leaded tin bronze, the brass ingots and castings, brass rod, and leaded tin bronze ingots and castings used in the manufacture of component parts and body shall conform to the following specifications:

Brass ingots and castings Grade 3 of IS: 292-1951

Brass rods in spindles, glands, crutches, water plates, nuts, etc IS: 319-1951

Leaded tin bronze ingots and castings Grade 2 of IS: 318-1952

5. MANUFACTURE

5.1 Plated Fittings

5.1.1 Before plating a mixing valve, the washer and the washer plate shall be removed.

5.1.2 The gland packing shall be protected from plating solution.

5.1.3 The plating shall be of either nickel or chromium. The minimum thickness of plating shall be 0.015 mm in case of nickel and 0.0025 mm in case of chromium (*see IS: 1068-1958*).

5.2 End Connection — The valves shall be supplied with union inlet and outlet connections, the tail pieces of which shall be of flat-seated type without spigot, to facilitate installation.

5.3 Screw Threads — Threading of inlet and outlet connections shall conform to IS: 554-1955.

5.4 Operation

5.4.1 The sequence of operation of the valve shall be as follows:

Off or Shut
Cold
Warm or Tepad
Hot

These positions shall be clearly indicated together with an arrow in the direction of increase of

temperature. Indication of warm or tepid position may, however, be omitted if so desired.

5.4.2 Closing of the valve shall be performed by rotation of control in an anti-clockwise direction.

5.4.3 The design shall be such that when the valve is in the 'off' or 'shut' position, the hot and cold water supplies are completely isolated from each other.

6. WORKMANSHIP

6.1 All gravity- and die-castings shall be in all respects, free from laps, blow holes and pitting. Both 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.

6.2 All hot-pressed components shall be sound and solid without lamination and shall be finished smooth.

7. TESTING

7.1 Tests

7.1.1 All castings and stampings shall withstand without leaking or sweating a hydraulic pressure of 20 kg/cm² applied for a period of two minutes with the control in the mid-open position.

7.1.2 When the control is in the 'shut' position, the valve shall remain closed and show no leakage against a pressure of 15 kg/cm² applied for a period of two minutes.

7.2 Permissible Loss of Head—The head loss through the mixing valve at different rates of flow shall not exceed those given in Table I. The head loss shall be the difference in pressure between

the pressure at the inlet and outlet connections with the flow control in the 'mid-position' that is, midway between fully-open and fully-closed and shall be determined as described in Appendix A.

TABLE I LOSS OF HEAD

(Clause 7.2)

SIZE OF VALVE	RATE OF FLOW l/min	MAXIMUM PERMISSIBLE HEAD LOSS IN FITTING m
15 mm	{ 5	1.0
	{ 10	1.5
	{ 15	2.5
20 mm	{ 20	1.5
	{ 25	2.0
	{ 30	3.0
25 mm	{ 40	2.5
	{ 45	3.0

8. MARKING

8.1 Each mixing valve shall be legibly marked with the following information:

- a) Manufacturer's name or trade-mark, and
- b) Size of valve

8.2 Each valve may also be marked with the ISI Certification Mark.

NOTE—The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, 1952 and the Rules and Regulations made thereunder. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A

(Clause 7.2)

DETERMINATION OF LOSS OF HEAD

A-1. The following method shall be adopted to determine loss of head in mixing valves for different rates of flow given in Table I. A typical arrangement of the apparatus for testing is indicated in Fig. 2.

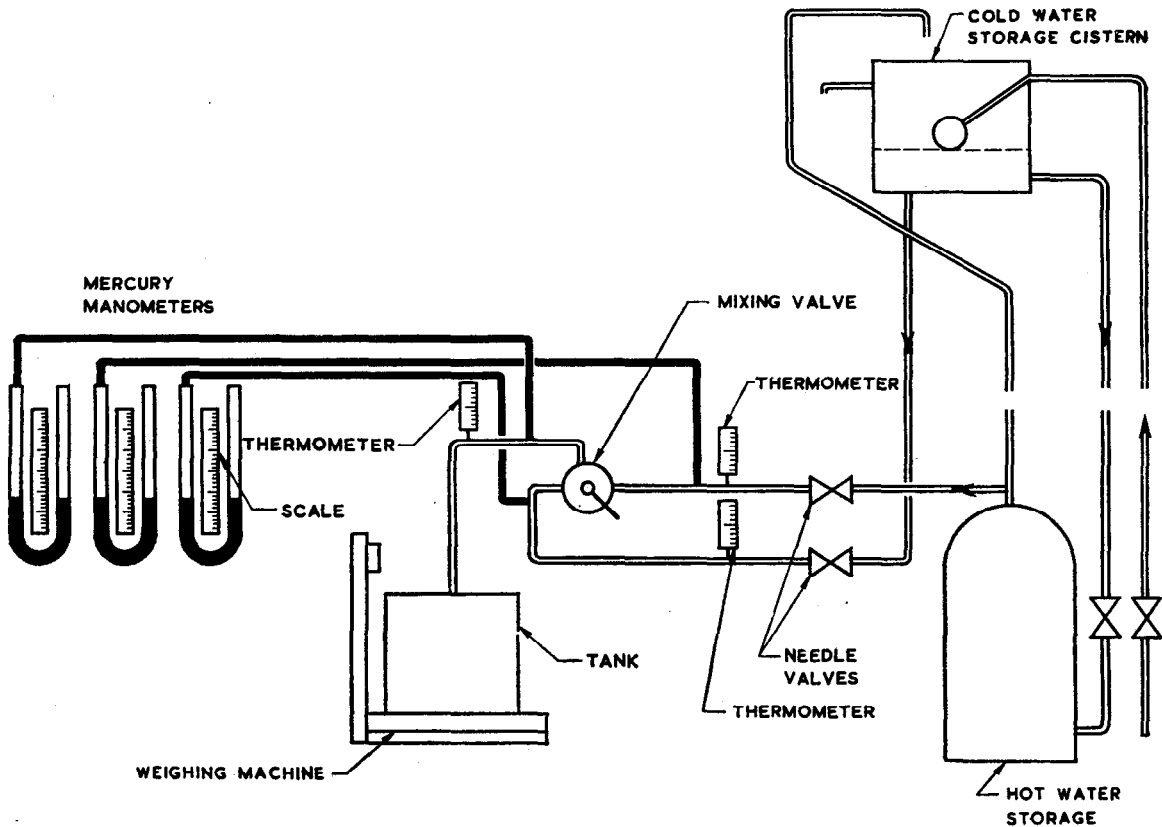
A-1.1 The flow from the valve shall be measured by weighing the discharged water in a 140-l capacity tank which is placed on a weighing machine calibrated and adjusted to suit the varying ratio of discharge according to the type and size of valve

under test. All readings shall be of one minute duration. The water supply pressure in the hot and cold inlets shall be measured by means of a mercury manometer. The water supply pressure shall be regulated and controlled at desired rate of flow by needle valves fitted at a distance not greater than 2.5 m from the main valve. The rate of flow in the hot water supply connection shall be equal to the rate of flow in the cold water supply connections during the period of test. A pipe, approximately 45 cm long, of the same nominal

bore as the mixing valve outlet shall be fitted to discharge the mixed water into the tank. The head loss through this length of pipe shall be measured and deducted from the supply pressure to give open discharge conditions. All test results shall be tabulated or be shown in graph form.

A-1.2 Where it is desired to measure the

temperature of the supply and discharge water, this shall be achieved by mercury thermometers inserted directly into the inlet and outlet pipe work and fitted at a distance not exceeding 30 cm from the valve connections. Unless a temperature test is being taken, it is not necessary to heat the water in the storage cylinder but to cover friction loss, it is necessary to take water from the cylinder to the hot side of the valve.



NOTE -- Thermometers are only required if it is desired to measure the temperature of water.

FIG. 2 METHOD OF TESTING MIXING VALVES