

इंटरनेट

मानक

Disclosure to Promote the Right To Information

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

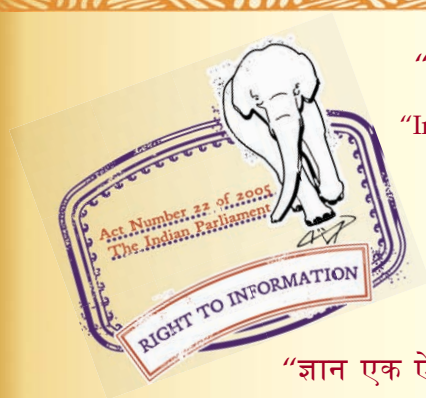
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

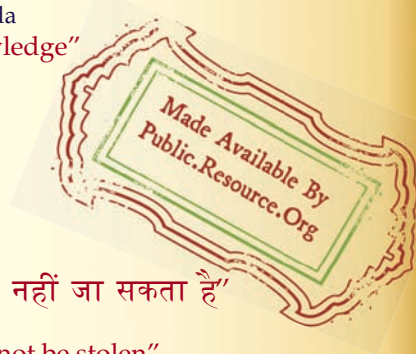
IS 6157 (1981): Valve inspection and test [MED 17: Chemical Engineering Plants and Related Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



*Indian Standard***VALVE INSPECTION AND TEST***(First Revision)*

1. Scope — Covers inspection and pressure test requirements for valves such as gate, check, plug and ball type. This standard may be used for other types of valves when it is specified in the individual valve standards or subject to agreement between the manufacturer and the purchaser if not specified in individual valve standards.

2. Inspection

2.1 Inspection at Manufacturer's Plant — If inspection by purchaser is specified in the purchase order, it shall be done at the manufacturer's plant. All reasonable facilities shall be given to the inspector for satisfying himself that the valves are manufactured in accordance with relevant standards and the purchase order.

2.2 Inspection Outside Manufacturer's Plant — If inspection of shell components produced at other than the manufacturer's plant is specified in the purchase order, these components shall be inspected by the purchaser's inspector at that location or at the valve manufacturer's works subject to agreement between the purchaser and the valve manufacturer.

2.3 Extent of Inspection — Normally inspection by the purchaser shall be limited to the following.

2.3.1 Visual examination of any finished component in the assembled valve. Visual examination of castings to ensure conformity to IS : 8092-1976 'Surface quality of steel castings for valves and fittings (visual method) '.

2.3.2 Dimensional check of the finished valve.

2.3.3 Dimensional checks of the valve components. These checks shall be carried out when agreed to between the manufacturer and the purchaser.

2.3.4 While witnessing of shell and seat pressure tests as specified in this standard, the purchaser's inspector may waive any part of normal inspection.

2.4 If specified in the purchase order, non-destructive testing, such as radiography and magnetic particle, on casting and forgings shall be carried out by the manufacturer to an agreed procedure or specification in the presence of purchaser's inspectors either at the valve manufacturer's plant or at the place of the supplier of the components. If copies of the relevant test certificates are to be given, this shall be so stated in the purchase order, including the number of copies required.

2.5 Material used for various components of valves shall be as specified in various specifications, indicated in the relevant individual valve-type standards. Any requirements of certificates for physical tests and chemical composition of materials shall be stated in the purchase order.

2.6 If inspection is specified, the valve manufacturer shall give at least seven-days notice on the availability of valves for inspection and tests.

2.7 Valves shall normally be tested before painting/primer coating. However, if phosphate coating is a normal practice of the valve manufacturer before assembly, such coating need not be removed before testing. If pressure tests in the presence of the purchaser's representative are specified in the purchase order, painted valves from stock may be retested without removal of paint. In case of valve with permanent lining such as PTFE, rubber, glass etc, the purchaser may specify pressure test on the shell prior to lining of the valve in addition to such tests on shell following lining.

Adopted 8 July 1981

© November 1981, BIS

Gr 2

3. Pressure Tests — The pressure tests indicated in this standard shall be carried out on each valve.

3.1 Shell Test — The hydrostatic test for the shell of the valves shall be carried out at a gauge pressure not less than 1.5 times the pressure rating at 38°C rounded off to the next higher 1 bar increment. During these tests discs or wedges, plugs shall remain in the open position and balls in the half open position. The packing gland in valves with stuffing box shall be sufficiently tight to maintain the test pressure. Visually detectable leakage through pressure boundary walls is not acceptable. There shall be no harmful inelastic deformation during or after tests. Leakage from packing shall not be the cause for rejection, if it could be demonstrated that the packing will not leak at the rated working pressure of the valve.

3.2 Back Seat Test — This hydrostatic test shall be made on gate-and globe-valves by applying pressure inside the assembled valve, with the valve ends closed, valve fully opened and either with stem packing removed or completely loose. Back seat test pressure shall be same as that of seat test pressure.

3.3 Seat Test (Air) — Valves shall be subjected to an air seat test at any pressure between 5.5 to 6.9 bar gauge. In case pressure rating is less than 5.5 bar air seat test pressure, if specified in purchase order, shall be equal to pressure rating. There shall be no leakage during the test.

On valves intended for low differential pressure service or vacuum service, a low pressure air seat test shall be carried out by the manufacturer, if so specified in the purchase order. The test pressure, then shall be specified by the purchaser and witnessed by purchaser's representative, if so desired. The pressure shall be applied as given below:

- a) Globe-valves; under the disc
- b) Check-valves; This test is not required; and
- c) Gate, plug and ball-valves; successively to each side of the closed valves. For Valves designed for flow in one direction only and so marked on the valve the pressure shall be applied on the upstream side of the valve only.

In all cases the valve shall be in the closed position with the side not under pressure open to atmosphere for detection of leakage.

For valves in double block and bleed application and for valves with independent double seating, the pressure shall be applied inside the bonnet or body with the discs closed and both sides open for inspection.

Plug and ball-valves shall be operated from fully closed to fully open position three times to demonstrate satisfactory mechanical operation and continued tightness after operation. It is permitted to charge sealant before testing on valves relying on sealing compound to effect seal.

3.4 Hydrostatic Seat Test

3.4.1 The seat test shall be made with seat clean and free of oil. However, if necessary to prevent galling, the seats may be coated with a film of oil of viscosity not greater than that of kerosene. This requirement does not apply to a valve in which a lubricant provides the primary seal. The seat test shall be carried out by closing the valve in the normal manner.

3.4.2 Valve shall be subjected to hydrostatic seat tests at a gauge pressure not less than 110 per cent (the hydrostatic seat test pressure shall not exceed the body rating or seat rating whichever is lower) of the rated pressure at 38°C rounded off to the next higher 1 bar increment. This shall be applied as specified in the seat test (air). There shall be no visible leakage during the test.

3.4.3 For check valves the hydrostatic seat pressure shall be applied on the down stream side. In addition to this, check valves shall also be tested on the down stream side to 25 percent of the hydrostatic seat test pressure.

No leakage is permissible during these tests.

4. Test Duration — The specified test pressure shall be maintained for each type of test as given in Table 1.

TABLE 1 TEST DURATION—SECONDS (MINIMUM)

Valve Size, (mm)	Duration, Seconds		
	Shell	Backseat	Seat
Up to and including 50	15	15	15
65 Up to and including 150	60	15	60
200 Up to and including 300	120	15	120
350 and larger	300	15	120

5. Test Fluid

- Hydrostatic tests shall be carried out with water at ambient temperature containing water soluble oil or suitable rust inhibitor. The use of any other liquid is subject to agreement between the manufacturer and the purchaser, and the viscosity of the same shall in no case be greater than that of water.
- The fluid for pneumatic tests shall be either air or inert gas. Air when used shall be free from oil as much as possible.

6. Test Certificates — If specified by the purchaser, test certificate confirming that the valves have been tested in accordance with this standard and stating the actual pressure and medium used in the tests shall be furnished by the manufacturer.

7. Special Tests

7.1 Fire Safe Tests — When required and specified in the relevant Indian Standard, these tests shall be carried out to an agreed procedure and requirement between the manufacturer and the purchaser.

7.2 Antistatic Device Testing — When required and specified in the relevant Indian Standard, these tests shall be carried out to an agreed procedure and requirement between the manufacturer and the purchaser.

8. Test Gauges — The gauges used for pressure testing shall be calibrated at intervals not exceeding three months by an independent competent authority if the manufacturer does not have such facilities. The results shall be recorded and shall be liable to inspection and verification by the purchaser's representative for acceptance as and when required.

In all the pressure tests, test pressure shall be measured for the stated duration without continuous use of any input to pressure build up by mechanical or any other means.

Notes to Purchaser — Purchaser shall inform the manufacturer at the inquiry stage and in the purchase order, of the following, as some of the clause of this standard permit alternatives:

- Whether normal inspection is required at the manufacturer's plant (see 2.1 and 2.6).
- Whether inspection of shell components is required (see 2.2).
- Whether any special material tests and any associated test certificates are required (see 2.4).
- Whether any supplementary inspection and any associated test certificates are required (see 2.5).
- Whether a test fluid other than water is required at ambient temperature (see 5).
- Whether valve test certificates are required (see 6).

EXPLANATORY NOTE

This is the first revision of IS: 6157-1971 'General rules for inspection of valves and cocks for fluid control purposes'.