# UL 1468

## STANDARD FOR SAFETY

Direct Acting Pressure Reducing and Pressure Restricting Valves

UL Standard for Safety for Direct Acting Pressure Reducing and Pressure Restricting Valves, UL 1468

Sixth Edition, Dated July 19, 2023

***Summary of Topics***

***This new edition of ANSI/UL 1468 dated July 19, 2023 incorporates editorial changes including renumbering and reformatting to align with current style.***

The revised requirements are substantially in accordance with Proposal(s) on this subject dated February 10, 2023 and June 2, 2023.

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# UL 1468

## Standard for Direct Acting Pressure Reducing and Pressure Restricting Valves

The first and second editions were titled Direct-Acting Pressure-Reducing and Pressure-Control Valves for Fire-Protection Service.

First Edition – January, 1985
Second Edition – May, 1991
Third Edition – May, 1995
Fourth Edition – May, 2004
Fifth Edition – May, 2016

**Sixth Edition**

**July 19, 2023**

This ANSI/UL Standard for Safety consists of the Sixth Edition.

The most recent designation of ANSI/UL 1468 as an American National Standard (ANSI) occurred on July 19, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in ULSE's Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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### INTRODUCTION



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## INTRODUCTION

### 1 Scope

1.1 These requirements cover direct-acting pressure-reducing and pressure- restricting valves intended to reduce the water pressure in standpipe systems or in the supply piping for sprinkler systems. These requirements also cover pressure- reducing valves that can be used as an indicating control valve in a sprinkler system.

1.2 The valves covered by these requirements are intended for use in:

a) Standpipe systems installed in accordance with the Standard for Installation of Standpipe and Hose Systems, NFPA 14; or

b) Sprinkler systems installed in accordance with the Standard for Installation of Sprinkler Systems, NFPA 13.

1.3 The valves covered by these requirements are intended to be inspected, tested and maintained in accordance with the Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

1.4 Direct-acting pressure-reducing and pressure-restricting valves covered by these requirements include the following patterns and sizes:

a) Angle Patterns for Standpipe Use – Inlet and outlet openings having nominal diameters of 1, 1-1/2, 2-1/2, or 3 NPS.

b) Angle Patterns for Sprinkler Systems – Sizes greater than 1 NPS.

c) Straightway Pattern for Standpipe Use – Inlet and outlet openings having nominal diameters of 1, 1-1/2, 2-1/2, or 3 NPS.

d) Straightway Patterns for Sprinkler Systems – Sizes greater than 1 NPS.

### 2 Components

2.1 A component of a product covered by this Standard shall:

a) Comply with the requirements for that component as specified in this Standard;

b) Be used in accordance with its rating(s) established for the intended conditions of use; and

c) Be used within its established use limitations or conditions of acceptability.

2.2 A component of a product covered by this Standard is not required to comply with a specific component requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product;

b) Is superseded by a requirement in this Standard; or

c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

2.3 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

## 3 Units of Measurements

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

## 4 Referenced Publications

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

4.2 The following publications are referenced in this Standard:

ASME B1.20.1, *Pipe Threads, General Purpose, Inch*

ASTM A53/A53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*

ASTM A135/A135M, *Standard Specification for Electric-Resistance-Welded Steel Pipe*

ASTM A795/A795M, *Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Pipe for Fire Protection Use*

AWWA C606, *Grooved and Shouldered Joints*

NFPA 13, *Installation of Sprinkler Systems*

NFPA 14, *Installation of Standpipe and Hose Systems*

NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*

NFPA 1963, *Fire Hose Connections*

UL 38, *Manual Signaling Boxes for Fire Alarm Systems*

UL 157, *Gaskets and Seals*

UL 753, *Alarm Accessories for Automatic Water-Supply Control Valves for Fire Protection Service*

## 5 Glossary

5.1 For the purpose of this standard, the following definitions apply.

5.2 NPS (NOMINAL PIPE SIZE) – A dimensionless designator for pipe sizes defined in standards including Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless, ASTM A53/A53M, Standard Specification for Electric-Resistance-Welded Steel Pipe, ASTM A135/A135M, and Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use, ASTM A795/A795M used to replace terms such as "Nominal Diameter" and "Nominal Size".

5.3 PRESSURE-REDUCING VALVE – A valve intended to reduce the downstream water pressure under both flowing (residual) and non-flowing (static) conditions.

5.4 PRESSURE-RESTRICTING VALVE – A valve or device intended to reduce downstream water pressure under flowing (residual) conditions only and for use on standpipe outlets only.

5.5 REFERENCED SETTING(S) – A location(s) for setting the valve as referenced in the manufacturer's installation and operating instructions and for which performance characteristics are provided.

5.6 RESIDUAL PRESSURE – For standpipe and sprinkler systems, pressure acting on a point in the system under flowing conditions.

5.7 STATIC PRESSURE – For standpipe and sprinkler systems, pressure acting on a point in the system under no-flow conditions.

## CONSTRUCTION

### 6 General

6.1 A valve intended for use as an indicating control valve in sprinkler systems shall be provided with means to positively indicate when the valve is in the open and closed position. The indicator shall be visible from two positions, 180° apart at a distance of 50 feet (15.24 m).

*Exception: The indicator is required to only be visible from one location if the indicator can be adjusted to a point of maximum visibility when the valve is installed.*

### 7 End Connections

7.1 An inlet for a valve shall be:

a) Of female pipe threads complying with the requirements in ASME B1.20.1; or

b) Of pipe threads complying with national pipe thread standards that apply where the valve is intended to be installed; or

c) Grooved end complying with AWWA C606.

7.2 The outlet of a valve intended for standpipe use shall be threaded in accordance with NFPA 1963, unless specifically constructed to fit existing equipment. The outlet shall be provided with at least four full threads. Outlets of a valve intended for stand pipe use shall be permitted to use threads complying with a specification where the valve is intended to be installed.

7.3 The outer end of threads other than taper pipe threads [see ASME B1.20.1] shall be terminated by the "Higbee Cut" to facilitate coupling and to reduce the likelihood of cross threading.

7.4 Outlets shall be permitted to have a grooved end complying with AWWA C606.

### 8 Rated Inlet Pressure

8.1 A pressure-reducing valve shall be constructed for use at a rated inlet pressure of 175 psig (1210 kPa) or greater.

8.2 A pressure-restricting valve shall be constructed for use at a rated inlet pressure of 175 psig (1210 kPa).

## 9 Outlet Pressure Settings – Valves Intended for Sprinkler Systems

9.1 A valve intended for use in sprinkler systems shall be constructed to incorporate a referenced setting or settings to provide a static outlet pressure not exceeding 175 psig (1210 kPa).

*Exception: A valve intended for deluge (open sprinkler) systems only is permitted to be constructed to incorporate a referenced setting or settings to provide a static outlet pressure greater than 175 psig (448 kPa) provided the manufacturer's instructions indicate that the pressure rating of the components installed downstream of the valve are not to be exceeded.*

9.2 A valve intended for use in sprinkler systems shall have a minimum residual pressure of 50 psig (345 kPa) for the flow ranges specified in the installation instructions.

## 10 Outlet Pressure Settings – Valves Intended for Standpipe System Outlets

10.1 A pressure-reducing valve intended for standpipe system outlets shall be constructed to incorporate a referenced setting or settings to provide static outlet pressures not exceeding 100 psig (691 kPa) for 1-1/2 NPS outlets and 175 psig (1210 kPa) for 2-1/2 NPS outlets and residual outlet pressures at the flows specified in Table 10.1.

**Table 10.1**
**Pressure-Reducing Valves – Residual Inlet and Outlet Pressures**

| Residual inlet pressure, psig | Outlet size, NPS | Residual outlet pressure, psig @ flow rate |
|---|---|---|
| > 100 | 1-1/2 | ≥ 65 and ≤ 100 @ ≥ 100 gpm |
| > 175 | 2-1/2 | ≥ 100 and ≤ 175 @ ≥ 250 gpm |

10.2 A pressure-restricting valve intended for standpipe system outlets shall be constructed to incorporate a referenced setting or settings to provide residual outlet pressures flows specified in Table 10.2.

**Table 10.2**
**Pressure-Restricting Valves – Residual Inlet and Outlet Pressures**

| Residual inlet pressure, psig | Outlet size, NPS | Residual outlet pressure, psig @ flow rate |
|---|---|---|
| ≤ 175 | 1-1/2 | ≥ 65 and ≤ 100 @ ≥ 100 gpm |
| ≤ 175 | 2-1/2 | ≥ 100 and ≤ 175 @ ≥ 250 gpm |

## 11 Bodies and Bonnets

11.1 For a valve intended for standpipe use, a pressure-retaining body and bonnet shall be made entirely of brass or bronze, or other material having at least equivalent resistance to corrosion.

11.2 A valve intended for use in sprinkler systems shall be made of cast iron or other materials having at least equivalent strength and resistance to corrosion.

11.3 A casting shall be smooth and free from scale, lumps, cracks, blisters, sand holes, or other defects that impairs intended operation. A casting shall not be plugged or filled, but may be impregnated to remove porosity.

## 12 Body-Seat Rings

12.1 A body-seat ring shall have a smooth, machined surface capable of complying with the Seat Leakage Test specified in 25.1.

12.2 A seat ring of an iron-bodied valve shall be made of brass or bronze and shall be held in place by screw threads, cold swaging, or the equivalent.

## 13 Valve Stems

13.1 Stem threads shall be Acme, modified Acme, half V, or square.

13.2 A stem shall be made of brass, bronze, or stainless steel type 304, 304L, 316 or 316L.

## 14 Stem Seals

### 14.1 General

14.1.1 A valve shall be provided with a means to prevent leakage at the valve stem. The bearing surface provided in a stuffing box gland or seal retainer for the stem shall be of brass or bronze or material having at least equivalent resistance to corrosion.

14.1.2 A valve intended to be serviced in the field shall be constructed to permit repacking of the stuffing box or replacement of an "O" ring seal when the valve is fully open and under rated pressure. See Leakage Tests, Section 25.

### 14.2 Stuffing boxes

14.2.1 A stuffing box shall embody a gland or follower with a packing nut. There shall be no threads within the stuffing box.

14.2.2 The depth of a stuffing box shall not be less than the diameter of the valve stem where the stem passes through the box.

14.2.3 The width of a stuffing box shall be sufficient to permit the entrance and use of packing removal tools.

14.2.4 The bottom and the end of the gland of a stuffing box shall be beveled.

14.2.5 The entire stuffing box of a cast-iron valve shall be of brass or bronze, and the stem opening through the bonnet shall be brass or bronze bushed.

### 14.3 Other types of stem seals

14.3.1 A ring, such as an "O" ring, used to provide a stem seal shall be made of vulcanized natural rubber or a synthetic rubber compound. The ring shall have uniform dimensions and cross section and shall be of a size and shape, and have sufficient resilience, to withstand the stresses that are encountered in the application. See Elastomeric Parts (Except Gaskets) Test, Section 21.

## 15 Handwheels

15.1 A handwheel, if provided, shall be made of material having a tensile strength at least equivalent to that of cast iron. A valve intended for standpipe use shall be provided with a handwheel.

15.2 A valve intended for use as a control valve in sprinkler systems shall be provided with a handwheel, handle, or equivalent means to open and close the valve. A handwheel or handle shall be made of material having tensile strength at least equivalent to that of cast iron.

15.3 The outside diameter of a handwheel or the length of a handle shall be not less than 2-5/8 inches (67 mm). Also, see Operating Torque Test, Section 22, and Mechanical Strength Test – Internal and External Valve Parts, Section 27.

15.4 A handwheel rim shall have a rounded surface and shall be free from sharp projections.

## 16 Seat Rings, Discs, and Holders

16.1 For a valve incorporating a disc or piston, the disc or piston holder shall be free to turn so that it seats without any scraping action that results in to damage the disc or piston.

16.2 A holder shall be secured to its stem by a locknut pinned in place after assembly, or by an equivalent securement means.

16.3 A seat seal shall be made of an elastomeric material suitable for the intended use. The seal shall have uniform dimensions and cross section and shall be of a size and shape, and have sufficient resilience, to withstand the stresses that may be encountered in the application. See Elastomeric Parts (Except Gaskets) Test, Section 21.

16.4 A disc or piston holder shall enclose the entire thickness of the outer edge of the disc or piston. The disc, piston, holder, and clamping ring shall be dimensioned so that the disc or piston face overhangs the body seat ring both inside and outside.

16.5 A disc nut or clamping ring shall be pinned in place or equivalently secured.

## 17 Valve Mechanisms

17.1 A part that bears against, rotates within, or slides on stationary parts, and that moves during valve operation, shall be either:

a) Made of corrosion-resistant material, such as bronze, chrome-plated bronze, monel metal, or the like; or

b) Fitted with bushings, inserts, or other parts made of corrosion-resistant material at those points where freedom of motion is required.

17.2 Any interior bolt or screw shall be made of bronze or of material having at least equivalent resistance to corrosion.

## 18 Valve Adjustments

18.1 A valve that is adjustable shall have means for determining its adjustment settings.

18.2 Adjustable valves shall be provided with a means to lock the valve setting or require the use of a tamper resistant valve setting tool.

## PERFORMANCE

### 19 General

19.1 Representative samples of each size valve shall be subjected to the tests specified in Sections 20 – 29. Additional samples of parts constructed of nonmetallic materials, such as rubber seal rings, are required for the tests described in the Elastomeric Parts (Except Gaskets) Test, Section 21.

19.2 Verification that a valve is constructed for use at a rated inlet pressure of at least 175 psig (1210 kPa) is considered to be demonstrated by complying with the requirements specified in Sections 20 – 29.

### 20 10-Day Moist Ammonia Air Stress Cracking Test

20.1 After being subjected to the conditions described in 20.2 – 20.4, a brass part containing more than 15 % zinc when examined using 25X magnification shall:

a) Show no evidence of cracking; or

b) Comply with the Operating Torque Test, Section 22, and the Leakage Tests, Section 25, if there is evidence of cracking.

20.2 Each test sample is to be subjected to the physical stresses normally imposed on or within a part as the result of assembly with other components. Such stresses are to be applied to the sample prior to and maintained during the test. Samples with threads, intended to be used for installing the product in the field, are to have the threads engaged and tightened to the torque specified in Table 20.1. Pipe sealing tape or pipe compound are not to be used on the threads.

**Table 20.1**
**Torque on Connections**

| Nominal pipe size | Torque | |
|---|---|---|
| NPS | pound-inches | (N·m) |
| 1 | 1200 | (136) |
| 1-1/4 | 1450 | (164) |
| 1-1/2 | 1550 | (175) |
| 2 | 1650 | (186) |
| 2-1/2 | 1750 | (198) |
| 3 | 1800 | (203) |
| 4 | 1900 | (215) |



20.3 Three samples are to be degreased and then continuously exposed in a set position for ten days to a moist ammonia-air mixture maintained in a glass chamber approximately 12 by 12 by 12 inches (305 by 305 by 305 mm) having a glass cover.

20.4 Approximately 600 ml of aqueous ammonia having a specific gravity of 0.94 is to be maintained at the bottom of the glass chamber below the samples. The samples are to be positioned 1-1/2 inches (38.1 mm) above the aqueous ammonia solution and supported by an inert tray. The moist ammonia-air mixture in the chamber is to be maintained at atmospheric pressure and at a temperature of 93 °F (34 °C).

## 21 Elastomeric Parts (Except Gaskets) Test

21.1 An elastomeric part used to provide a seal shall have the following properties when tested as specified in UL 157:

a) For silicone rubber (having poly-organo-siloxane as its constituent characteristic), a minimum tensile strength of 500 psi (3.4 MPa) and a minimum ultimate elongation of 100 %.

b) For natural rubber and synthetic rubber other than silicone rubber, a minimum tensile strength of 1500 psi (10.3 MPa) and minimum ultimate elongation of 150 %; or a minimum tensile strength of 2200 psi (15.2 MPa) and a minimum ultimate elongation of 100 %.

c) Those properties relating to maximum tensile set; minimum tensile strength and elongation after oven aging; and hardness after oven aging, all as specified in UL 157. The maximum service temperature used to determine the oven time and temperature for oven aging is considered to be 60 °C (140 °F).

21.2 UL 157 provides for the testing of either finished elastomeric parts or sheet or slab material. Sheet or slab material is to be tested when the elastomeric parts are O-rings having diameters of less than 1 inch (25.4 mm). The material tested is to be the same as that used in the product, regardless of whether finished elastomeric parts or sheet or slab material is tested.

## 22 Operating Torque Test

### 22.1 General

22.1.1 A valve that is provided with a handwheel shall withstand, without malfunction of any part, a flow at a pressure up to its rated pressure when tested as specified in 22.1.2 – 22.2.2. The operating torque shall be not more than the applicable value specified in Table 22.1. This test can be conducted separately or in conjunction with the Operation Test, Section 24.

**Table 22.1**
**Maximum Operating Torque**

| Handwheel diameter | | Maximum operating torque | |
|---|---|---|---|
| | | Handwheel | |
| inches | (mm) | pound-inches | (N·m) |
| 2-5/8 | (70) | 42 | (4.7) |
| 3 | (75) | 54 | (6.1) |
| 3-1/4 | (80) | 66 | (7.5) |
| 3-1/2 | (90) | 72 | (8.1) |
| 4 | (100) | 120 | (13.6) |
| 4-3/8 | (110) | 162 | (18.3) |
| 5 | (130) | 222 | (25.1) |
| 6 | (150) | 324 | (36.6) |
| 7 | (180) | 420 | (47.5) |

22.1.2 A sample of the valve is to be connected to a piezometer both upstream and downstream to which a pressure gauge has been attached, and to a water supply that provides the rated pressure and the maximum flow capacity of the valve. The downstream side of the sample is to be fitted with piping and a valve to control the water flow through the sample. The sample then is to be subjected to the procedures specified in 22.2.1 and 22.2.2.

### 22.2 Test procedure

22.2.1 The sample is to be adjusted to a reference setting point yielding the lowest intended outlet pressure at maximum rated flow. The sample then is to be closed and the inlet pressure is to be increased to the minimum inlet pressure specified by the manufacturer for this set point. The sample then is to be fully opened while the inlet pressure is maintained at this value. The sample then is to be closed. This process is to be repeated using the referenced setting yielding the lowest outlet pressure and the maximum rated inlet pressure. The entire test procedure then is to be repeated with the sample adjusted to a referenced setting yielding the highest outlet pressure. The sample then is to be subjected to the Leakage Tests, Section 25, and Strength of Body Test, Section 26.

22.2.2 During this procedure, measurements are to be made of the operating torque required to:

a) Close the sample to the point only where flow is stopped;

b) Fully close it;

c) Open it to the point where leakage begins; and

d) Fully open it.

## 23 Spring Test

23.1 A spring used in a valve mechanism shall operate as intended when tested for 50,000 cycles of operation at a rate of not more than 6 cycles per minute. Each cycle of operation is to consist of a compression of the spring to its minimum intended operating length (maximum compression during operation) and an extension back to its original length.

23.2 A sample valve into which the cycled spring has been assembled then is to be subjected to at least three point checks from the data generated during the Operation Test, Section 24, and the values obtained shall not differ by more than 10 % from those obtained with as-received samples.

23.3 As an alternative to the requirements in 23.2, the mechanical properties (spring constant) of the cycled spring are to be compared to the mechanical properties of the uncycled spring. The values obtained shall not differ by more than 10 %.

## 24 Operation Test

### 24.1 General

24.1.1 When tested as described in 24.1.2 – 24.3.4, a valve shall operate without malfunction and perform in accordance with the manufacturer's instructions throughout the:

a) Rated inlet pressure range;

b) Rated outlet pressure range; and

c) The flow range of the valve, during the test.

24.1.2 Pressure-restricting valves are to be tested in accordance with 24.2.1 and 24.2.2. Pressure-reducing valves are to be tested in accordance with 24.3.1 – 24.3.4.

### 24.2 Pressure-restricting valves

24.2.1 The inlet of a sample of the valve is to be connected to a piezometer to which a pressure gauge is attached and to a water supply that provides the rated pressure and maximum flow required. The downstream side of the sample is to be fitted with a piezometer equipped with a pressure gauge, piping, and a valve to control the water flow through the sample.

24.2.2 The sample is to be adjusted to a referenced setting yielding the lowest outlet pressure indicated in the installation instructions. A flow of 100 ±2 gpm (6 ±0.1 L/s) for 1-1/2 NPS valves and 250 ±5 gpm (16 ±0.1 L/s) for 2-1/2 NPS valves is to be established and the pressure drop between piezometers recorded. This procedure is to be repeated for each valve setting referenced in the manufacturer's instructions. After completing the test for all valve settings, the test is to be repeated with the valve removed from the line and the piezometers coupled together. The pressure drop values obtained are to be subtracted from the pressure drop values obtained with the devices in the line to obtain the pressure drop of the device. The recorded pressure loss at each valve setting shall be within ±10 psig (±68.9 kPa) of the pressure loss as referenced in the manufacturer's instructions for a flow of 100 gpm (6 L/s) for 1-1/2 NPS valves and 250 gpm (16 L/s) for 2-1/2 NPS valves.

### 24.3 Pressure-reducing valves

24.3.1 The inlet of a sample valve is to be connected to a piezometer to which a pressure gauge is attached and to a water supply that provides the rated pressure and maximum flow required. The downstream side of the sample is to be fitted with a piezometer equipped with a pressure gauge, piping, and a valve to control the water flow through the sample.

24.3.2 The sample is to be adjusted to a referenced setting yielding the lowest outlet pressure indicated in the installation instructions. The inlet pressure then is to be increased to the minimum inlet pressure recommended by the manufacturer, and the outlet pressure and flow recorded. The inlet pressure then is to be increased in 50 psig (345 kPa) increments or less up to the maximum rated inlet pressure, and the outlet pressure and flow recorded at each increment. Also, at each increment, the shutoff valve at the end of the test line that controls the water flow through the sample is to be adjusted to obtain a zero-flow condition and other flow points up to the maximum rated flow. This procedure then is to be repeated at settings representative of the range recommended by the manufacturer. The recorded outlet pressures at each increment and all flow conditions shall be within ±10 % of the pressure referenced in the manufacturer's installation instructions. Except for the zero-flow condition, the time for the valve to return within ±10 % of the outlet pressure referenced in the manufacturer's instructions shall not exceed 5 seconds.

24.3.3 To determine the performance characteristics of the valve when the inlet pressure is below the intended outlet pressure, the test procedure described in 24.3.2 is to be conducted with the valve adjusted to the referenced settings yielding the lowest and highest outlet pressures and with inlet pressures as low as 50 psig (345 kPa) up to the intended outlet pressure of the valve.

24.3.4 After conducting the tests described in 24.3.2, the valve is to be adjusted to a referenced setting yielding the highest outlet pressure. The valve is then to be subjected to the rated inlet pressure while the valve is flowing approximately one-half the maximum flow recommended by the manufacturer. The shutoff valve at the end of the test line is to be closed from the partially open position to achieve a no- flow condition at approximately 5 seconds after starting to close the shutoff valve. The recorded outlet pressure shall not exceed 175 psig (1210 kPa).

## 25 Leakage Tests

### 25.1 Seat leakage test

25.1.1 When tested as described in 25.1.2, a valve seat shall withstand an internal hydrostatic pressure of the rated pressure and twice the rated pressure of the valve without leakage.

25.1.2 The inlet of a sample of the valve is to be connected to a water supply. The seating faces of the sample are to be wiped clean, after which the sample is to be closed, pressurized to rated pressure for 1 minute, and examined for leakage. The sample then is to be pressurized to twice rated pressure and maintained at that pressure for 1 minute.

### 25.2 Body leakage test

25.2.1 When tested as described in 25.3.2, a valve body and joints shall withstand an internal hydrostatic pressure of twice the rated pressure of the valve without leakage.

25.2.2 After completion of the test specified in 25.1.2, the outlet of the sample is to be closed by a cap or the equivalent, and the sample is to be partially opened to allow pressurization of the entire body to rated pressure, including the bonnet joint and up to the stuffing box or sealing device, and examined for leakage. The sample then is to be pressurized to twice rated pressure and maintained at that pressure for 1 minute.

### 25.3 Repacking test

25.3.1 When tested as described in 25.3.2, leakage through the unpacked stuffing box or altered stem sealing device of a valve intended to be serviced in the field shall not interfere with the replacement of the packing or seal ring.

25.3.2 After completion of the test specified in 25.2.2, the sample is to be fully opened, and the packing in the stuffing box or at least one seal ring of any sealing device is to be removed. The sample, in the fully open position, is to be subjected to the rated pressure for 1 minute. Then, with the sample still pressurized, an attempt is to be made to reinsert the packing or seal ring into the stuffing box or sealing device. Leakage through the unpacked stuffing box or altered stem sealing device shall not interfere with the replacement of the packing or seal ring.

## 26 Strength of Body Test

26.1 A valve shall withstand for 5 minutes without rupture, an internal hydrostatic test pressure of four times the rated inlet pressure when tested as specified in 26.2. If separate tests for the inlet and outlet side are needed as specified in 26.2, the outlet side shall be tested at five times the maximum static outlet pressure indicated in the installation and operating instructions. In addition, there shall be no leakage through the castings or other evidence of structural weakness. Leakage at joints is acceptable.

26.2 During this test, the valve is to be partially open; except that if testing with the valve partially open is impractical, two tests are to be conducted; the first with the inlet pressurized, and then with the outlet pressurized.

## 27 Mechanical Strength Test – Internal and External Valve Parts

27.1 A valve assembly shall withstand, without malfunction of any internal or external valve part which would affect the operability or strength of the valve, such as a handwheel, stem assembly, and seat seal, a torque applied at the handwheel as specified in 27.2.