

Manually operated ball valves and closed bottom taper plug valves for gas installations in buildings

ICS 23.060.20

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A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings

Robinets à tournant sphérique et robinets à tournant conique à fond plat destinés à être manoeuvrés manuellement et à être utilisés pour les installations de gaz des bâtiments

Handbetätigte Kugelhähne und Kegelhähne mit geschlossenem Boden für die Gas-Hausinstallation

This European Standard was approved by CEN on 11 December 1997.

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CEN

European Committee for Standardization
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 236, Non-industrial manually operated shut-off valves for gas, the Secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1998, and conflicting national standards shall be withdrawn at the latest by July 1998.

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Foreword to amendment A1

This document (EN 331:1998/A1:2010) has been prepared by Technical Committee CEN/TC 236 “Non industrial manually operated shut-off valves for gas and particular combinations valves-other products”, the secretariat of which is held by UNI.

This Amendment to the European Standard EN 331:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

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1 Scope

1.1 This European Standard specifies the general requirements for the construction, performance and safety of ball valves and closed bottom taper plug valves. It also details the test methods and marking requirements.

A1 It applies to metallic valves for domestic and commercial not directly buried installations inside or outside of buildings, using gases of the first, second and third family (specified in EN 437) and working up to $0,2 \times 10^5$ Pa, $0,5 \times 10^5$ Pa and 5×10^5 Pa.

NOTE "Not directly buried" within the context of this standard means that valves below ground are not in direct contact with earth or other materials e.g. that they are in a protected encasement. **A1**

1.2 Valve nominal sizes (DN) covered by this European Standard are as follows:
6, 8, 10, 12, 15, 20, 25, 32, 40, 50.

2 Normative references

A1 The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. **A1**

A1 EN 377, *Lubricants for applications in appliances and associated controls using combustible gases except those designed for use in industrial processes.*

EN 437, *Test gases — Test pressures — Appliance categories.*

EN 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment.*

EN 682, *Elastomeric Seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

EN 751-1, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 1: Anaerobic jointing compounds*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds*

EN 751-3, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 3: Unsintered PTFE tapes*

EN 10226 (all parts), *Pipe threads where pressure tight joints are made on the threads*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes*

EN 12627, *Industrial valves — Butt welding ends for steel valves*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 1503-1, *Valves — Materials for bodies, bonnets and covers — Part 1: Steels specified in European Standards*

EN 1503-3, *Valves — Materials for bodies, bonnets and covers — Part 3: Cast irons specified in European Standards*

EN 1503-4, *Valves — Materials for bodies, bonnets and covers — Part 4: Copper alloys specified in European Standards*

EN 1555-3, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*

EN 1593:1999, *Non-destructive testing — Leak testing — Bubble emission techniques*

EN 1775:2007, *Gas supply — Gas pipework for buildings — Maximum operating pressure less than or equal to 5 bar — Functional recommendations*

EN 60730-1:2000, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:1999, modified)*

EN ISO 6708, *Pipework components — Definition and selection of DN (nominal size) (ISO 6708:1995)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

ISO 65, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1.*

ISO 261, *ISO general purpose metric screw threads — General plan.* **A1**

A1 Text deleted **A1**

3 Definitions

For the purposes of this European Standard, the following definitions apply:

3.1

standard reference conditions

conditions to which all measured values are corrected (i.e. a temperature of 15 °C; pressure of $1013,25 \times 10^2$ Pa absolute; dry air)

3.2

shut-off valve

device which admits or closes the gas flow by movement of the obturator. A valve is manually operated if operation can be performed by the user

3.3 components

3.3.1 obturator

movable part of the valve which shuts off the gas flow

3.3.2 actuating mechanism

part of the valve which actuates the obturator

3.3.3 manual actuator

manually operated actuating mechanism

3.3.4 mechanical joint

joint in which gas tightness is achieved by compression with or without a seal

NOTE This joint can be easily disassembled and reassembled. 

3.3.5 gas way

passage in the valve through which the gas flows

3.3.6 joint

means of connecting elements of a gas installation
[EN 1775:2007]

3.3.7 flexible appliance connector

element of flexible pipework to be fitted between the end of fixed pipework and the appliance inlet connection
[EN 1775:2007] 

3.4 leak-tightness

3.4.1 external leak-tightness

leak-tightness of a gas-carrying compartment with respect to atmosphere

3.4.2 internal leak-tightness

leak-tightness between the inlet and outlet of the valve with the obturator in the closed position

3.5 pressures

pressures measured under static conditions; all pressures quoted are relative to atmospheric pressure

3.5.1 inlet pressure

pressure at the inlet of the valve

3.5.2 outlet pressure

pressure at the outlet of the valve

3.5.3 maximum operating pressure (MOP)

 maximum pressure at which a valve can be operated continuously under normal operating conditions 

3.5.4 test pressure

pressure to be applied during the test

3.5.5 pressure difference

difference between inlet and outlet pressures

3.6 rated flow rate

flow rate of air, under standard reference conditions, at a given pressure drop

3.7 temperatures

3.7.1 ambient temperature

temperature of the medium surrounding the gas valve

3.7.2 maximum operating temperature (MOT)

maximum temperature at which a valve can be operated continuously under normal conditions

3.7.3 minimum operating temperature

lowest temperature (−5 °C; −20 °C; −40 °C) declared by the manufacturer at which the valve can be operated

3.8 operating torque

3.8.1 opening torque

torque to be applied to the manual actuator to move the obturator from the closed to the open position

3.8.2 closing torque

torque to be applied to the manual actuator to move the obturator from the open to the closed position

3.9 cycling frequency

number of working cycles, i.e. from the closed position to the open position and back to the closed position, in unit time

3.10 DN (nominal size)

see EN ISO 6708 

4 Classification

A1 4.1 Internal pressure classes **A1**

The valves are divided into three classes, corresponding to the maximum working pressure as follows:

A1 Table 1 — Valve pressure classes

Class	Pressure range	Remark
MOP 0,2	0 to $0,2 \times 10^5$ Pa	MOP = $0,2 \times 10^5$ Pa
MOP 0,5	0 to $0,5 \times 10^5$ Pa	MOP = $0,5 \times 10^5$ Pa
MOP 5	0 to 5×10^5 Pa	MOP = 5×10^5 Pa

4.2 Temperature classes

The valves are divided into three temperature classes as follows:

Table 2 — Valve temperature classes

Class	Temperature range
−5 °C	−5 °C to 60 °C
−20 °C	−20 °C to 60 °C
−40 °C	−40 °C to 60 °C

5 Construction requirements

5.1 Materials

A1 5.1.1 Any part in contact with the gas or the surrounding atmosphere, shall be manufactured from corrosion-resistant materials or shall comply with salt spray test (see 7.6.3), if relevant.

The corrosion protection for springs and other moving parts shall not be impaired by any movement. **A1**

5.1.2 For welded valves, the tests in 7.6.4 and 7.6.3 shall apply only to moving parts in contact with the gas and to any part in contact with the surrounding atmosphere.

A1 5.1.3 Material indicated in 5.1.8, b) and c), excluding a), shall be tested in accordance with 7.6.3 (salt spray resistance).

Once the test has been run, no corrosion which could impair the device's operation shall be revealed by visual examination (disregarding possible salt deposits), and the external tightness of the device (connected and disconnected) remains in conformity with the requirement defined in 6.2 (leak-tightness). **A1**

A1 5.1.4 Springs and other moving parts manufactured from non-corrosion-resistant materials shall be protected against corrosion and shall retain their protective coating despite any movement resulting from the operation of the valve. After the test of 7.6 these parts shall withstand the test of 7.6.3.

5.1.5 Elastomeric materials shall comply with EN 549 or EN 682 as appropriate to the intended use.

5.1.6 Lubricants shall comply with EN 377.

5.1.7 Anaerobic jointing compounds shall comply with EN 751-1.

5.1.8 The shell, obturator and stem shall be made in one of the following materials:

- a) copper alloy excluding Aluminium-bronze¹⁾;
- b) ductile cast iron excluding laminar cast iron²⁾;
- c) forged steel and cast steel³⁾. **A1**

5.2 Construction

5.2.1 General

Valves shall be designed such that, once installed, it is impossible to remove the obturator or a seal without damaging the valve or leaving clear signs of tampering on it.

A1 5.2.2 Product appearance

All valve components, when viewed with the naked eye corrected for normal vision, shall be free from sharp edges and corners which could cause damage, injury or incorrect operation. **A1**

A1 5.2.3 Valve maintenance

All valves shall be designed to be maintenance free for a reasonable economic working life. **A1**

5.2.4 Springs

If a spring is used, the two end-faces of the spring shall be parallel and perpendicular to the axis of the spring. The end coils of a spring shall not damage their mating faces.

5.2.5 Wall thickness

The wall thickness from any gas way to atmosphere or to holes connected to the atmosphere, shall not be less than 1 mm. Holes for screws, pins, etc., which are used for the assembly of parts and for mounting, shall not provide any leak path between gas ways and the atmosphere.

5.2.6 Plug valves

5.2.6.1 The plug shall be designed and mounted in the housing in such a way that the top edge of the sealing surface protrudes into the corresponding sealing surface of the housing taper.

¹⁾ On this subject EN 1503-4 is available.

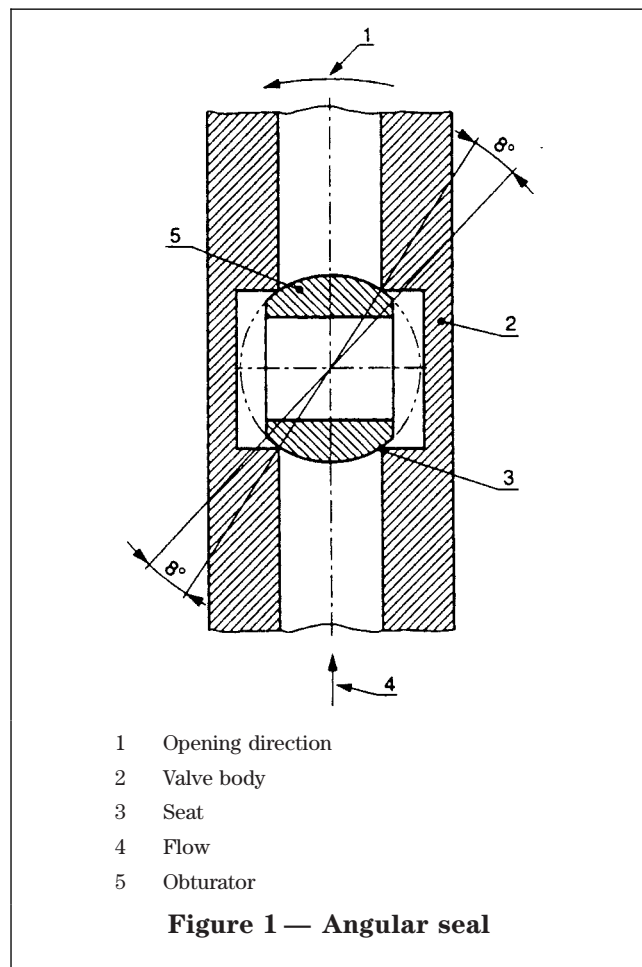
²⁾ On this subject EN 1503-3 is available.

³⁾ On this subject EN 1503-1 is available.

5.2.6.2 A minimum spacing of 1 mm shall be provided to ensure that the plug is able to advance in the event of wear. The top of the sealing surface of the plug shall be lower than the sealing surface in relation to the body.

5.2.7 Angular seal

With the valve in the fully closed position, the angular distance between the gas port in the obturator and both the inlet port and outlet port in the valve body, shall be at least 8° with a measurement uncertainty of 1° , when measured according to 7.7 (see Figure 1).



5.3 Joints

5.3.1 Threads

A1 5.3.1.1 Threaded inlet and outlet connections for valves with pressure-tight joints made on the threads, shall comply with EN 10226.

5.3.1.2 Pressure-tight joints shall comply with either EN 10226-1, ISO 261 or, EN ISO 228-1. **A1**

5.3.1.3 Valves with threaded connections shall have flats on the body which, when used for fitting, shall accommodate commercially available tools.

A1 5.3.2 Bolted flange joint

For valves with flanged connections the dimensions of the connections shall be in accordance with EN 1092-1, EN 1092-2 and EN 1092-3. **A1**

NOTE Raised face flanges are recommended.

A1 5.3.3 Capillary soldered or capillary brazed joints

The dimensions of connections for capillary soldered and capillary brazed joints shall comply with EN 1254-1. **A1**

5.3.4 Joints

If a union (nut with liner) with a non-metallic gasket is used for the outlet connection, any gasket shall be at least 2 mm thick and shall be attached to the liner in such a way that it cannot be accidentally detached.

A1 5.3.5 Compression joints

The dimensions of the construction of the compression joints shall comply with EN 1254-2. **A1**

A1 5.3.6 Weld ends

Butt welded ends for steel valves shall comply with EN 12627.

5.3.7 Valves with polyethylene joints

Polyethylene joints shall be in accordance with EN 1555-3.

5.4 Seals

Sealing on the obturator shall be constructed so that tightness is achieved by mechanical means. This shall exclude the use for this purpose of all sealing materials such as liquids, pastes and tapes.

The tightness between the different parts of the body shall be assured by mechanical means. Additional products, like glues, pastes, tapes, split pins, ... may be used in order to maintain the mechanical tightness. If glues, pastes, tapes are used, they shall comply with EN 751-1, EN 751-2 and EN 751-3. **A1**

5.5 Operation

5.5.1 Valves shall be constructed so that they can be operated by means of a manual actuator such as a handle, key or similar device.

5.5.2 Valves operated by turning shall close in a clockwise direction.

The rotation from open to closed shall be a quarter turn. If the manual actuator is detachable then the end of the operating shaft shall be marked so that the open and closed positions are clearly indicated.