SLOVENSKI STANDARD
SIST EN 331:2000

01-april-2000

Ročne krogelne pipe in zasuni za hišne plinske napeljave

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

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

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

Ta slovenski standard je istoveten z: **EN 331:1998**

ICS:

23.060.20	Zapirni ventili (kroglasti in pipe)	Ball and plug valves
91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

SIST EN 331:2000 **en**

EUROPEAN STANDARD
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Descriptors: gas valves, stopcocks, metal products, manual controls, residential buildings, definitions, classifications, specifications, equipment specifications, performance evaluation, tests, marking

English version

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

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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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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Contents

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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.

It applies to 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).

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

This European standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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
prEN 1254	Copper and copper alloys - Plumbing fittings
ISO 7	Pipe threads where pressure-tight joints are made on the threads
ISO 65	Carbon steel tubes suitable for screwing in accordance with ISO 7-1
ISO 228	Pipe threads where pressure-tight joints are not made on the threads
ISO 261	ISO general purpose metric screw threads - General plan
ISO 7005	Metallic flanges

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 (temperature 15°C; pressure 1013,25 x 10^2 Pa absolute; dry air).

3.2 shut off valve: Device which admits or closes the gas flow by movement of the closure member. A valve is manually operated if operation can be performed by the user.

3.3 Components

3.3.1 closure member: Movable part of the valve which shuts off the gas flow.

3.3.2 actuating mechanism: Part of the valve which actuates the closure member.

3.3.3 manual actuator: Manually operated actuating mechanism.

3.3.4 compression joint: Assembly of all the components necessary to make the joint except the pipe.

3.3.5 gas way: Passage in the valve through which the gas flows.

3.3.6 union connection: Assembly of all the components necessary to make the joint with a pipe.

3.3.7 flexible connection: An element of flexible pipework to be fitted between the end of the valve and the appliance inlet connection.

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 closure member 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 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 closure member from the closed to the open position.

3.8.2 closing torque: Torque to be applied to the manual actuator to move the closure member 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.

4 Classification

4.1 Pressure classes

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

Table 1 : Valve pressure classes

Class	Pressure range
0,2 MOP	0 to 0,2 x 10^5 Pa
0,5 MOP	0 to 0,5 x 10^5 Pa
5 MOP*	0 to 5 x 10^5 Pa
*In some countries, national regulations require a special pressure (20 bar) for valves used with third family gas. For those valves, "20" will be added to the class reference (for example MOP 5-20).	

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 General

5.1.1 Materials

5.1.1.1 Any part in contact with the gas or the surrounding atmosphere, shall be manufactured from corrosion-resistant materials or shall be suitably protected and shall withstand the humidity test in 7.6.5 and the paint scratch test in 7.6.4.
The corrosion protection for springs and other moving parts shall not be impaired by any movement.

5.1.1.2 For welded valves the tests in 7.6.5 and 7.6.4 shall apply only to moving parts in contact with the gas and to any part in contact to the surrounding atmosphere.

5.1.1.3 Surfaces which are protected by a coating, shall withstand the test of 7.6.4 before and after the humidity test of 7.6.5, without the ball penetrating the protective coating to expose bare metal.

5.1.1.4 Springs and other moving parts which shall be suitably protected against corrosion and shall retain their protective coating despite any movement resulting from the operation of the valve. After the test of 6.6 these parts shall withstand the test of 7.6.5.

5.1.1.5 All markings shall be durable and resistant to atmospheric conditions. Labels and their markings shall neither deteriorate nor lift nor become unreadable by humidity and temperature.

5.1.1.6 Rubber materials shall conform to EN 549.
Until a specific European standard becomes available, other non-metallic materials for seals (e.g. synthetic fibers, graphite) shall conform to the requirements of those countries in which the valve will be used.

5.1.1.7 Lubricants shall conform to EN 377.

5.1.1.8 The valve shall be made in one of the following materials:

- copper alloy excluding Aluminium-bronze[1)]
- ductile cast iron excluding laminar cast iron[2)]
- forged steel and cast steel[3)]

5.1.2 Construction

5.1.2.1 General

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

5.1.2.2 Product appearance

All valve components shall be free from burrs and clean (e.g. free from swarf and core-sand), and shall be of sound manufacture. All valve components shall be free from sharp edges and corners which could cause damage, injury or incorrect operation, when viewed with the naked eye.

5.1.2.3 Valve maintenance

Valves designed to be maintained shall be such that it is difficult to remove parts serving to seal against gas without specialist knowledge and that any tampering is evident and incorrect reassembly is impossible.

Seals for moving parts which separate gas ways from the atmosphere, shall maintain their original leak- tightness without any manual adjustment.

5.1.2.4 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.

5.1.2.5 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.

5.1.2.6 Plug valves

5.1.2.6.1 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.

5.1.2.6.2 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.

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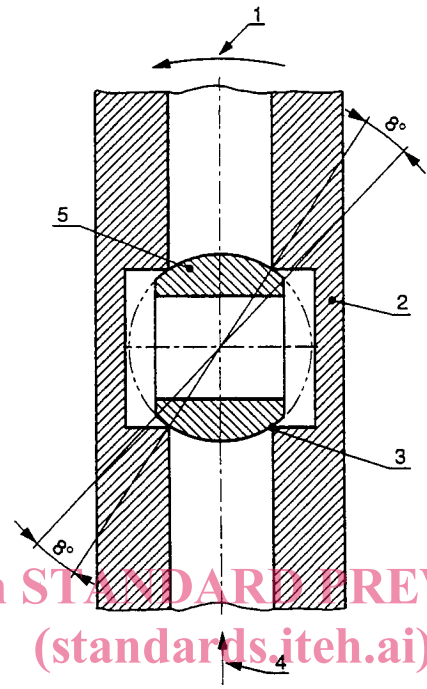
1) On this subject CEN/TC 69 is preparing the draft European standard prEN 1503-4 “Valves - Shell materials - Part 4: Copper alloys” (W.I. 00069060)

2) On this subject CEN/TC 69 is preparing the draft European standard prEN 1503-3 “Valves - Shell materials - Part 3: Cast irons” (W.I. 00069059)

3) On this subject EN 10028 and EN 10213 are available and ECISS/TC 28 is preparing the draft European standard prEN 10222.

5.1.2.7 Angular seal

With the valve in the fully closed position, the angular distance between the gas port in the closure member 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 fig. 1).



1 Opening direction
2 Valve body
3 Seat
4 Flow
5 Closure member

Figure 1: Angular seal

5.1.3 Connections

5.1.3.1 Threads

5.1.3.1.1 Threaded inlet and outlet connections for valves with pressure-tight joints made on the threads, shall conform to ISO 7.

5.1.3.1.2 Where threads for non pressure-tight joints are required, they shall conform to ISO 228 or ISO 261.

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

5.1.3.2 Flanges

For valves with flanged connections the dimensions of the connections shall be in accordance with ISO 7005.

NOTE: Raised face flanges are recommended.

5.1.3.3 Capillary joints

The dimensions of connections for capillary joints shall conform to prEN 1254.

5.1.3.4 Union connections

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.

5.1.3.5 Compression joints

While waiting for a European or International Standard specifying the dimensions of the construction of the compression joints, those joints shall conform to the current requirements of the country where the valve is used.

5.1.3.6 Weld ends

While waiting for a European or International Standard specifying the dimensions of the construction of the weld ends, those weld ends shall conform to the current requirements of the country where the valve is used.

5.1.4 Seals

Sealing on the closure member shall be constructed so that tightness is achieved by mechanical means. This excludes all sealing materials such as liquids, pastes, and tapes.

Sealing between split part bodies shall be constructed so that tightness is achieved by mechanical means. Sealants used for such connections shall withstand all torque and bending moment values.
For valves intended to be serviced, the tightness of the serviceable part shall be maintained after dismantling and reassembly.

5.2 Operation

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

5.2.2 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.

5.3 Stops

On valves the end positions "open" and "closed" shall be clearly identified and limited by fixed, non-adjustable stops.
The manual actuator shall be designed so that it is:

- at right angles to the direction of the flow for the closed position;
- parallel with the direction of the flow for the open position.

If the stop mechanism is part of the handle, the handle and the shaft shall be all of one piece; the fastening of the handle shall be sealed.

5.4 High temperature resistance

See Annex C.

6 Performance requirements

6.1 General

For valves with an inlet size different to the outlet size, the test value shall correspond to that for the smaller size.