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Utgåva 1

**Vattenförsörjning – Manuella kulventiler av
kopparlegering – Provning och krav**

**Building valves – Manually operated copper alloy
and stainless steel ball valves for potable water
supply in buildings – Tests and requirements**

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September 2003

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English version

Building valves - Manually operated copper alloy and stainless steel ball valves for potable water supply in buildings - Tests and requirements

Robinetterie de bâtiment - Robinets d'arrêt à tournant sphérique en alliage de cuivre et en acier inoxydable pour la distribution d'eau potable dans les bâtiments - Essais et caractéristiques

Gebäudearmaturen - Handbetätigte Kugelhähne aus Kupferlegierungen und nicht rostenden Stählen für Trinkwasseranlagen in Gebäuden - Prüfungen und Anforderungen

This European Standard was approved by CEN on 1 August 2003.

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Contents

page

| | |
|---|----|
| Foreword | 3 |
| Introduction | 4 |
| 1 Scope | 5 |
| 2 Normative references | 5 |
| 3 Terms and definitions..... | 5 |
| 4 Designation..... | 6 |
| 5 Design requirements | 7 |
| 5.1 Materials..... | 7 |
| 5.1.1 Body and ball materials..... | 7 |
| 5.2 End connections | 8 |
| 5.3 Operation | 9 |
| 5.3.1 Operating devices | 10 |
| 5.4 Stops | 10 |
| 5.5 Ball bore..... | 10 |
| 5.5.1 Full bore | 10 |
| 5.5.2 Reduced bore | 10 |
| 6 Performance requirements | 11 |
| 6.1 Operating torque..... | 11 |
| 6.2 Stop resistance | 11 |
| 6.3 Leak-tightness..... | 11 |
| 6.4 Angular seal..... | 11 |
| 7 Test methods..... | 12 |
| 7.1 Operating torque test | 12 |
| 7.2 Torque and bending test | 13 |
| 7.2.1 General..... | 13 |
| 7.2.2 Sequence of torsion and bending moment tests for valves | 13 |
| 7.3 Stops and spindle — Mechanical resistance test..... | 16 |
| 7.4 Hydraulic tests | 16 |
| 7.4.1 Leak-tightness test | 16 |
| 7.4.2 Hydraulic strength | 17 |
| 7.5 Acoustic tests and requirements | 17 |
| 7.5.1 Principle | 17 |
| 7.5.2 Test18 | 18 |
| 7.5.3 Requirements | 18 |
| 7.6 Endurance test | 18 |
| 7.6.1 Endurance test | 18 |
| 7.6.2 Test installation..... | 18 |
| 7.6.3 Test18 | 18 |
| 7.7 Angular seal..... | 19 |
| 8 Marking | 19 |
| Bibliography | 21 |

Foreword

This document (EN 13828:2003) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

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 March 2004, and conflicting national standards shall be withdrawn at the latest by March 2004.

The requirements with regard to the drinking water quality are specified in national regulations.

This document includes a Bibliography.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

EN 13828:2003 (E)

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this standard:

- 1) this standard provides no information as to whether the product may be used without restriction in any of the member states of the EU or EFTA;
- 2) it should be noted that, while awaiting the adoption of the verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

1 Scope

This European standard applies primarily to copper alloy ball valves, dimensions DN 8 to DN 100, for potable water supply in buildings up to PN 10 and a distribution temperature of 65 °C. Occasional excursions up to 90 °C are permitted for a period of 1 h maximum.

This standard applies also to ball valves in combination with other components in the same body.

This standard specifies:

- the requirements of the materials and the design of ball valves;
- the mechanical, hydraulic and acoustic requirements of ball valves;
- the test methods to verify the requirements of ball valves;
- the marking requirements of ball valves.

Ball valves in combination with other valves should fulfil the same requirements.

2 Normative references

This European Standard incorporates by dated or undated reference, 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 (including amendments).

EN ISO 3822-1, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 1: Method of measurement (ISO 3822-1:1999)*.

EN ISO 3822-3, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3:1997)*.

EN ISO 6509, *Corrosion of metals and alloys — Determination of dezincification resistance of brass (ISO 6509:1981)*.

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

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

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

ball valves

valves in which a manually operated ball rotates about an axis at right angle to the direction of flow and in the open position, the flow passes through the ball in a straight or angled line and with a normal operating position of either fully open or fully closed. Ball valves will be opened or closed by a single turn through 90°

They ensure the complete prevention of flow in a water pipe.

The following types are covered:

EN 13828:2003 (E)

- straight pattern ball valves (see Figure 1);
- angle pattern ball valves (see Figure 2).

3.2

nominal size (DN)

nominal sizes of ball valves, corresponding to EN ISO 6708

3.3

end connections

typical end connections defined in 5.2 (see Table 3)

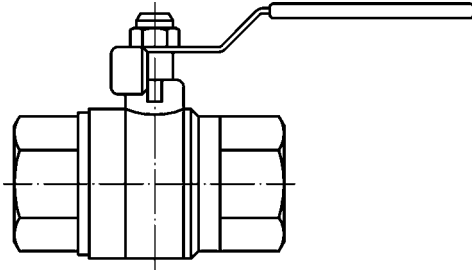


Figure 1 — Example Straight pattern (S)

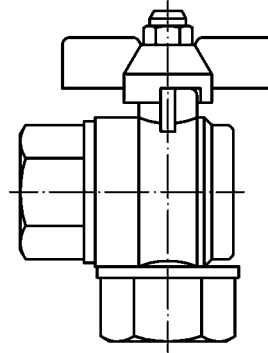


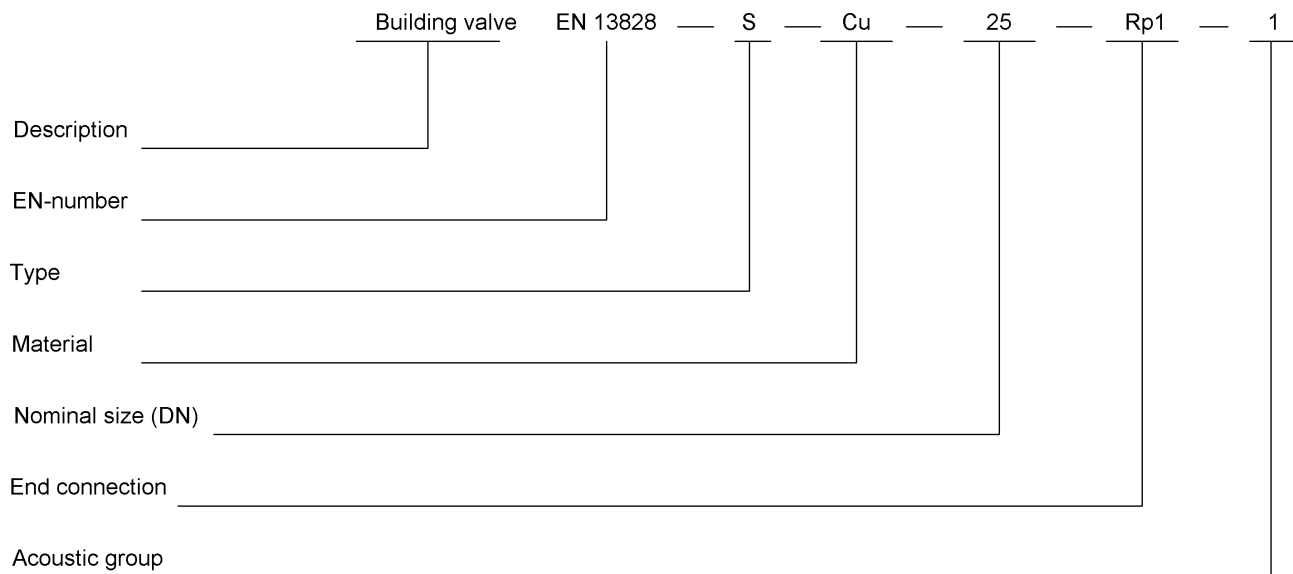
Figure 2 — Example: Angle pattern (A)

4 Designation

The designation of a ball valve comprises:

- its type and material;
- its nominal size (DN);
- its bore, whether full or reduced;
- its end connections;
- its acoustic group;
- number of this standard, i.e. EN 13828.

EXAMPLE Straight pattern ball valve (S) of copper alloy, DN 25, with threads Rp 1 on both sides, acoustic group 1, according to EN 13828.



5 Design requirements

5.1 Materials

The selection of materials is the responsibility of the manufacturer, provided the complete valve satisfies the requirements of this standard. The materials and coatings used shall not contaminate or change the drinking water, when in normal or accidental contact up to a temperature of 90 °C.

The manufacturer shall state in his technical and sales literature which materials and coatings are used. The materials, in particular copper alloys, for which recommendations or international standards exist, shall comply with them. These references shall be stated.

5.1.1 Body and ball materials

5.1.1.1 Copper alloys

Examples of suitable copper alloys are given in Table 1.

Table 1 — Examples of copper alloys

| Material designation | | EN standard |
|----------------------|--------|---------------------------------|
| Symbol | Number | |
| CuSn10-C | CC480K | EN 1982 |
| CuSn5Zn5Pb5-C | CC491K | EN 1982 |
| CuSn3Zn8Pb5-C | CC490K | EN 1982 |
| CuZn39Pb3 | CW614N | EN 12420, EN 12164, EN 12165 |
| CuZn40Pb2 | CW617N | EN 12420 |

5.1.1.2 Dezincification resistant copper alloy

Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification. In the countries where the use of products made of dezincification resistant materials is required,

EN 13828:2003 (E)

the products have to guarantee a dezincification depth less than 200 µm in any direction, they have to be tested in accordance with EN ISO 6509 and have to be marked in compliance with the indication in clause 8.

5.1.1.3 Stainless steels

Examples of suitable stainless steels (more than 16 % chromium) are given in Table 2.

Table 2 — Examples of stainless steels

| Material designation | | EN standard |
|----------------------|--------|-------------|
| Symbol | Number | |
| X6CrNiMoTi17-12-2 | 1.4571 | EN 10213-4 |
| X5CrNiMo17-12-2 | 1.4401 | EN 10213-4 |
| X2CrNiMo17-12-2 | 1.4404 | EN 10272 |
| GX5CrNiMoNb19-11-2 | 1.4581 | EN 10272 |
| GX5CrNiMo19-11-2 | 1.4408 | EN 10272 |

5.1.1.4 Body and ball materials

The ball shall be of solid material with cylindrical bore (e.g. copper-zinc alloy — chromium plated, plastic coated, special steel according to the "EU-Directive on the quality of water intended for human consumption").

5.2 End connections

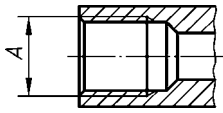
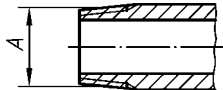
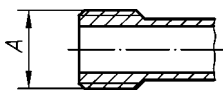
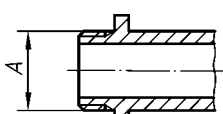
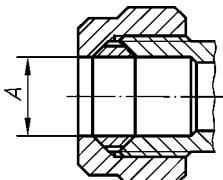
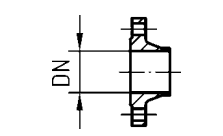
Examples of end connections are defined in Table 3. Compression ends for use with plastic pipes are described in EN 1254-3.

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

Other end connections are permitted provided they comply with an international standard.

For different connection threads the nominal size (DN) is dependent on the smallest connection thread.

Table 3 — Examples of end connections and nominal sizes (DN)

| Type | a | DN 8 | DN 10 | DN 15 | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|--|----|-------|-------|-------|-------|--------|--------|------------------|-----------------|--------|--------|--------|
| a) Internal thread to ISO 7-1  | A | Rp ¼ | Rp ⅜ | Rp ½ | Rp ¾ | Rp 1 | Rp 1¼ | Rp 1½ | Rp 2 | Rp 2½ | Rp 3 | Rp 4 |
| b) external thread to ISO 7-1  | A | R ¼ | R ⅜ | R ½ | R ¾ | R 1 | R 1¼ | R 1½ | R 2 | R 2½ | R 3 | R 4 |
| c) flat faced external thread ISO 228-1  | A | G ⅜ B | G ½ B | G ¾ B | G 1 B | G 1¼ B | G 1½ B | G 1½ B G 1¾ B | G 2 B G 2⅜ B | G 3 B | G 3½ B | — |
| d) external thread with shoulder to ISO 228-1  | A | G ¼ B | G ⅜ B | G ½ B | G ¾ B | G 1 B | G 1¼ B | G 1½ B G 1¾ B | G 2 B G 2⅜ B | G 2½ B | G 3 B | G 4 B |
| e) compression end for copper pipe to EN 1254-2  | A | 10 | 12 | 15/18 | 22 | 28 | 35 | 42 | 54 | 76,1 | 88,9 | 108 |
| f) flanged connection to ISO 7005-3  | DN | — | — | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| ^a Reference dimensions. | | | | | | | | | | | | |

5.3 Operation

Ball valves shall close in a clockwise direction. The rotation of the ball from open to close position shall be 90°. The operating devices shall be designed to be easily operated by hand.