



**SLOVENSKI STANDARD**  
**SIST EN 13547:2014**

**01-januar-2014**

**Nadomešča:**

**SIST-TS CEN/TS 13547:2007**

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**Industrijski ventili - Krogelni ventili iz bakrovih zlitin**

Industrial valves - Copper alloy ball valves

Industriearmaturen - Kugelhähne aus Kupferlegierungen

Robinetterie industrielle - Robinets à tournant sphérique en alliage de cuivre

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**Ta slovenski standard je istoveten z: ~~SIST EN 13547:2013~~ EN 13547:2013**

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**ICS:**

23.060.20      Zapirni ventili (kroglasti in      Ball and plug valves  
pipe)

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EUROPEAN STANDARD

EN 13547

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ICS 23.060.20

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## Industrial valves - Copper alloy ball valves

Robinetterie industrielle - Robinets à tournant sphérique en  
alliage de cuivre

Industriearmaturen - Kugelhähne aus Kupferlegierungen

This European Standard was approved by CEN on 29 August 2013.

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

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## Contents

Foreword.....	3
<b>1 Scope.....</b>	<b>4</b>
<b>2 Normative references.....</b>	<b>4</b>
<b>3 Terms and definitions .....</b>	<b>5</b>
<b>4 Requirements .....</b>	<b>6</b>
4.1 Classification.....	6
4.2 Design.....	9
4.3 Functional characteristics .....	13
<b>5 Test procedures .....</b>	<b>14</b>
5.1 Production pressure testing .....	14
5.2 Seat leakage rates .....	14
<b>6 Declaration of compliance .....</b>	<b>15</b>
<b>7 Designation .....</b>	<b>15</b>
<b>8 Marking .....</b>	<b>15</b>
8.1 Mandatory markings .....	15
8.2 Supplementary markings.....	15
8.3 Omission of markings.....	16
<b>9 Preparation for storage and transportation .....</b>	<b>16</b>
9.1 Protection .....	16
9.2 Obturator position.....	16
9.3 Body ends .....	16
<b>Annex A (normative) Materials .....</b>	<b>17</b>
<b>Annex B (normative) Pressure/temperature ratings.....</b>	<b>20</b>
<b>Annex C (normative) Method of testing for the determination of angular movement of operating element .....</b>	<b>22</b>
C.1 General .....	22
C.2 Test method.....	22
C.3 Alternative test .....	22
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 97/23/EC (PED).....</b>	<b>24</b>
<b>Bibliography.....</b>	<b>25</b>

## Foreword

This document (EN 13547:2013) has been prepared by Technical Committee CEN/TC 69 "Industrial valves", 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 April 2014, and conflicting national standards shall be withdrawn at the latest by April 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 13547:2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 97/23/EC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The following elements of the standard have been updated:

— normative references in Clause 2;

— design of shaft in 4.2.1.4;

— materials for manufacture of series A and B valves in Table A 1;

— Annex ZA.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**EN 13547:2013 (E)****1 Scope**

This European Standard applies to copper alloy ball valves for general use having flanged, threaded, capillary or compression or loose nut/union body ends.

This European Standard does not apply to copper alloy ball valves for drinking water applications.

This European Standard specifies the design and performance requirements including materials, pressure/temperature ratings for the shell and body seats, dimensions, test procedures and marking.

For some specific fields of application, for example gas, valves to this European Standard can be used provided the requirements of the relevant performance standards are met. Approval by the relevant regulatory body may be required.

The range of nominal sizes is DN 6 to DN 300 and of nominal diameters 6 mm to 110 mm.

The range of pressure designations covered is PN 6 ; PN 10 ; PN 16 ; PN 20 ; PN 25 ; PN 32 ; PN 40 ; PN 63 ; Class 150 and Class 300.

For the applicability of each nominal size/diameter and each pressure designation to the different types of valve end, see 4.1.

**2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 19:2002, *Industrial valves — Marking of metallic valves*

EN 558, *Industrial valves — Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems — PN and Class designated valves*

EN 736-1:1995, *Valves — Terminology — Part 1: Definition of types of valves*

EN 736-2:1997, *Valves — Terminology — Part 2: Definition of components of valves*

EN 736-3:2008, *Valves — Terminology — Part 3: Definition of terms*

EN 1092-3:2003, *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 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes*

EN 1254-4:1998, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends*

EN 1254-5, *Copper and copper alloys — Plumbing fittings — Part 5: Fittings with short ends for capillary brazing to copper tubes*

EN 1759-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy flanges*

- EN 1982, *Copper and copper alloys — Ingots and castings*
- EN 12163, *Copper and copper alloys — Rod for general purposes*
- EN 12164, *Copper and copper alloys — Rod for free machining purposes*
- EN 12167, *Copper and copper alloys — Profiles and bars for general purposes*
- EN 12168, *Copper and copper alloys — Hollow rod for free machining purposes*
- EN 12266-1:2012, *Industrial valves — Testing of valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*
- EN 12420, *Copper and copper alloys — Forgings*
- EN 12516-3, *Valves — Shell design strength — Part 3: Experimental method*
- EN 12570, *Industrial valves — Method for sizing the operating element*
- 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)*
- EN ISO 5211, *Industrial valves — Part-turn valve actuator attachments (ISO 5211)*
- EN ISO 6509, *Corrosion of metals and alloys — Determination of dezincification resistance of brass (ISO 6509)*
- ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*
- ASME B1.20.1, *Pipe threads, General purpose, Inch*
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### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 736-1:1995, EN 736-2:1997 and EN 736-3:2008, together with the following apply.

#### 3.1

##### **loose nut end**

body end provided with tailpiece which retains a loose internally threaded nut or ring for connection to the mating component

#### 3.2

##### **union end**

body end provided with an external thread to which is attached a threaded nut or ring, which retains a tailpiece for connection to the mating component

#### 3.3

##### **NPS**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes, and which comprises the letters NPS followed by a dimensionless number indirectly related to the physical size of the bore or outside diameter of the end connections

Note 1 to entry: The number following the letters NPS does not represent a measurable value and therefore is not used for calculation purposes except where specified in the relevant standard.

## EN 13547:2013 (E)

## 4 Requirements

## 4.1 Classification

## 4.1.1 Nominal sizes

The nominal sizes applicable to each type of body end shall be as specified in Table 1 and Table 2.

NOTE 1 DN is applicable to flanged valves (PN designated) and NPS is applicable to flanged valves (Class designated). Threaded valves are normally identified by the thread size (NPS). Capillary and compression end valves are normally identified by nominal diameter expressed as nominal outside diameter of the connecting tube or pipe. The use of DN for valves with body ends other than flanged is possible.

NOTE 2 DN 6 and DN 8 are not listed in EN ISO 6708 but are the commonly used equivalent nominal size for valves having size 1/8 and 1/4 threaded ends respectively.

Table 1 — Nominal sizes for flanged and threaded end valves

Nominal size		Valve body ends		
		Flanged		Threaded
DN	NPS	PN	Class	PN
6	1/8	-	-	•
8	1/4	-	-	•
10	3/8	•	-	•
15	1/2	•	-	•
20	3/4	•	•	•
25	1	•	•	•
32	1 1/4	•	•	•
40	1 1/2	•	•	•
50	2	•	•	•
65	2 1/2	•	•	•
80	3	•	•	•
100	4	•	•	•
125	5	•	•	-
150	6	•	•	-
200	8	•	•	-
250	10	•	•	-
300	12	•	•	-



Table 2 — Nominal diameters for capillary and compression ends valves

Nominal diameter mm	Valve body ends		Nominal diameter mm	Valve body ends	
	Capillary and compression ends for copper tubes	Compression ends for plastic pipe		Capillary and compression ends for copper tubes	Compression ends for plastic pipe
6	O	-	-	-	-
8	O	-	40	X	O
10	O	O	40,5	X	X
12	O	O	42	O	-
14	X	X	50	-	O
14,7	X	X	53,6	X	X
15	O	X	54	O	-
16	X	O	63	-	O
18	O	X	64	O	-
20	-	O	66,7	O	-
21	X	X	70	X	-
22	O	X	75	-	O
25	X	O	76,1	O	-
27,4	X	X	80	X	-
28	O	X	88,9	O	-
32	-	O	90	-	O
34	X	X	108	O	-
35	O	-	110	-	O

NOTE O = recommended European tube or pipe outside diameters.  
X = other European tube or pipe outside diameters.

#### 4.1.2 Nominal size relationship

The relationship between nominal size, DN and body end type shall be as given in Table 3.

Table 3 — Relationship between nominal size, DN and body end types

Nominal size	Body end connections					
	Flanged		Threaded	Loose nut, union end	Capillary and compression ends for copper tubes	Compression ends for plastic pipe
	PN	Class				
	Nominal size			Nominal diameter		
DN	NPS		DN			
DN 6	6	-	1/8	-	6	8
DN 8	8	-	1/4	-	8 ; 10	10
DN 10	10	-	3/8	10	12 ; 14	12 ; 14
DN 15	15	1/2	1/2	15	14,7 ; 15 ; 16 ; 18	14,7 ; 15 ; 16 ; 18
DN 20	20	3/4	3/4	20	21 ; 22	20 ; 21 ; 22
DN 25	25	1	1	25	25 ; 27,4 ; 28	25 ; 27,4 ; 28
DN 32	32	1 1/4	1 1/4	32	34 ; 35	32 ; 34
DN 40	40	1 1/2	1 1/2	40	40 ; 40,5 ; 42	40 ; 40,5
DN 50	50	2	2	50	53,6 ; 54	50 ; 53,6
DN 65	65	2 1/2	2 1/2	-	64 ; 66,7 ; 70 ; 76,1	63 ; 75
DN 80	80	3	3	-	80 ; 88,9	90
DN 100	100	4	4	-	108	110
DN 125	125	5	-	-	-	-
DN 150	150	6	-	-	-	-
DN 200	200	8	-	-	-	-
DN 250	250	10	-	-	-	-
DN 300	300	12	-	-	-	-

#### 4.1.3 PN and Class designations

The PN and Class designations applicable to valves having flanged or threaded body ends shall be as specified in Table 4.

NOTE 1 PN 20 and PN 32 are established PN designations for threaded end copper alloy valves and are additional to the list of PN designations given in EN 1333.

Valves with capillary or compression ends are not designated by PN or Class.

NOTE 2 EN 1254-1, EN 1254-2, EN 1254-3 and EN 1254-5 which give details of the body ends for capillary and compression end valves in this document, do not use the PN designation system given in EN 1333. If PN designations are allocated to capillary or compression end valves, it is the responsibility of the manufacturer to provide information on any pressure and/or temperature limitations in service.

Table 4 — Range of PN and Class - Flanged and threaded ends

Body end	PN 6	PN 10	PN 16	PN 20	PN 25	PN 32	PN 40	PN 63	Class 150	Class 300
Flanged	-	•	•	-	•	-	•	-	•	•
Threaded	•	•	•	•	•	•	•	•	-	-

#### 4.1.4 Valve series

Two series of valves are specified: series A for flanged and threaded end valves and series B for flanged, threaded, capillary, compression and loose nut/union end valves.

Series A valves have the shell components constructed from the restricted range of copper-aluminium and copper-tin alloys (see Table A.1) specified in EN 1092-3 and EN 1759-3, and are suitable for the pressure/temperature ratings given in these two flange standards. Additional copper-aluminium and copper-tin alloys are specified in Table A.1 for series A valves and the pressure/temperature ratings for valves in these materials are the same as given in EN 1092-3 and EN 1759-3.

Series B valves have the shell components constructed from copper-zinc-lead or complex copper-zinc alloys (see Table A.2) and have lower allowable pressures at elevated temperatures than series A valves.

## 4.2 Design

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### 4.2.1 Construction

#### 4.2.1.1 General

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Valves shall be properly designed incorporating appropriate safety margins and taking all relevant operating factors into account in order to ensure that they will be safe throughout their intended life. The construction details shall be the responsibility of the manufacturer.

#### 4.2.1.2 Patterns

Valves shall be full bore or reduced bore (see Figure 1).

NOTE The construction details given in Figure 1 are examples; other designs are possible.

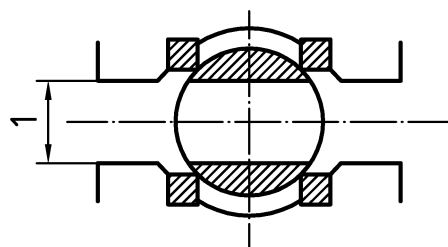


Figure 1a — Full bore

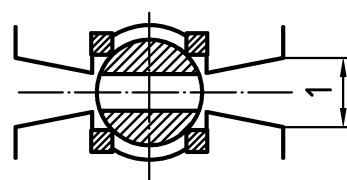


Figure 1b — Reduced bore

#### Key

1 nominal size

Figure 1 — Valve bore configurations

#### 4.2.1.3 Body

The body may be of one-piece or multi-piece construction.