



SLOVENSKI STANDARD
SIST EN 12288:2011

01-junij-2011

Nadomešča:
SIST EN 12288:2004

Industrijski ventili - Zasuni iz bakrovih zlitin

Industrial valves - Copper alloy gate valves

Industriearmaturen - Schieber aus Kupferlegierungen

Robinetterie industrielle - Robinets-vannes en alliage de cuivre

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Ta slovenski standard je istoveten z: ~~SIST EN 12288:2010~~ EN 12288:2010

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ICS:

23.060.30 Zapirni ventili (zasuni) Gate valves

SIST EN 12288:2011

en,fr,de

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EUROPEAN STANDARD

EN 12288

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2010

ICS 23.060.30

Supersedes EN 12288:2003

English Version

Industrial valves - Copper alloy gate valvesRobinnerie industrielle - Robinets-vannes en alliage de
cuivre

Industriearmaturen - Schieber aus Kupferlegierungen

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Foreword

This document (EN 12288:2010) 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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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 EN 12288:2003

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, see informative Annex ZA, which is an integral part of this document.

This document supersedes EN 12288:2003 where the following modifications were made:

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- a) the normative references were updated in Clauses 2 and 3, in 4.1.1, in 4.1.4, in Table 5, in 4.2.4.3, in Tables A.1 and A.2, in Table B.1;
- b) Table 5 and Table B.1 were corrected;
- c) in Table ZA.1: [SIST EN 12288:2011
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- 1) sub-clause 4.2 was correlated to PED Annex I, section 2.1;
 - 2) sub-clause 4.2.3 was correlated to PED Annex I, section 2.2;
 - 3) correlation of sub-clause 4.2.3 to PED Annex I, section 2.2.1 was deleted;
 - 4) correlation of sub-clause 4.2.6 to PED Annex I, section 2.5 was deleted;
 - 5) correlation of Annex A to PED Annex I, section 4.2 was deleted.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

EN 12288:2010 (E)**1 Scope**

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

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

For some specific fields of application, for example, drinking water or 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 8 to DN 500 and of nominal diameters is 8 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 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.

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

EN 558:2008, *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, *Valves — Terminology — Part 1: Definition of types of valves*

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

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

EN 1057, *Copper and copper alloys — Seamless round copper tubes for water and gas in sanitary and heating applications*

EN 1092-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

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

EN 1982:2008, *Copper and copper alloys — Ingots and castings*

EN 12163:1998, *Copper and copper alloys — Rod for general purposes*

EN 12164:1998, *Copper and copper alloys — Rod for free machining purposes*

EN 12167:1998, *Copper and copper alloys — Profiles and rectangular bar for general purposes*

EN 12168:1998, *Copper and copper alloys — Hollow rod for free machining purposes*

EN 12266-1:2003, *Industrial valves — Testing of valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*

EN 12266-2:2002, *Industrial valves — Testing of valves — Part 2: Tests, test procedures and acceptance criteria — Supplementary requirements*

EN 12420:1999, *Copper and copper alloys — Forgings*

EN 12449, *Copper and copper alloys — Seamless, round tubes for general purposes*

EN 12516-3, *Valves — Shell design strength — Part 3: Experimental method*

EN 12570, *Industrial valves — Method for sizing the operating element*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 5210:1991, *Industrial valves — Multi-turn valve actuator attachments (ISO 5210:1991)*

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ASME B1.20.1:1983, *Pipe threads, general purpose (inch)*

3 Terms and definitions

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For the purposes of this document, the terms and definitions of types of valves and components and the terms and definitions given in EN 736-1, EN 736-2 and EN 736-3 apply, together with the following terms and definitions.

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NOTE The terms maximum allowable pressure, PS, and test pressure, PT, defined in EU Directive 97/23/EC (PED) are equivalent to the terms allowable pressure, p_s , and test pressure, p_t , defined in EN 736-3:2008.

3.1

loose nut end

body end provided with a 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, for the purpose of Class designated flanges according to this standard, the letters NPS followed by a dimensionless number which is indirectly related to the physical size of the bore or outside diameter of the end connections

NOTE The number following the letters NPS does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard. See EN ISO 6708.

[Adapted from EN 1759-3:2003]

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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 Tables 1 and 2.

NOTE 1 DN is applicable to flanged valves (PN designated) and loose nut/union end valves 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 the nominal outside diameter of the connecting tube or pipe. The use of DN for valves with body ends other than flanged is permitted.

NOTE 2 DN 8 is not listed in EN ISO 6708:1995 but is the commonly used equivalent nominal size for valves having size $\frac{1}{4}$ threaded ends.

NOTE 3 NPS $\frac{1}{4}$ and NPS $\frac{3}{8}$ are not listed in EN 1759-3:2003.

Table 1 — Nominal sizes for flanged, threaded and loose nut/union end valves

Nominal size	Valve body ends				Nominal size	Valve body ends		
	Flanged		Threaded	Loose nut, union end		Flanged		Threaded
	PN	Class				PN	Class	
DN 8	-	-	$\frac{1}{4}$	-	DN 100	DN 100	4	4
DN 10	DN 10	-	$\frac{3}{8}$	DN 10	DN 125	DN 125	5	-
DN 15	DN 15	$\frac{1}{2}$	$\frac{1}{2}$	DN 15	DN 150	DN 150	6	-
DN 20	DN 20	$\frac{3}{4}$	$\frac{3}{4}$	DN 20	DN 200	DN 200	8	-
DN 25	DN 25	1	1	DN 25	DN 250	DN 250	10	-
DN 32	DN 32	$1\frac{1}{4}$	$1\frac{1}{4}$	DN 32	DN 300	DN 300	12	-
DN 40	DN 40	$1\frac{1}{2}$	$1\frac{1}{2}$	DN 40	DN 350	DN 350	14	-
DN 50	DN 50	2	2	DN 50	DN 400	DN 400	16	-
DN 65	DN 65	$2\frac{1}{2}$	$2\frac{1}{2}$	-	DN 450	DN 450	18	-
DN 80	DN 80	3	3	-	DN 500	DN 500	20	-

Table 2 — Nominal diameters for capillary and compression end 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
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	-	-	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 relationships

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

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

Nominal size DN	Body end types					
	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	NPS	DN			
DN 8	8	-	¼	-	8 ; 10	10
DN 10	10	-	⅜	10	12 ; 14	12 ; 14
DN 15	15	½	½	15	14,7 ; 15 ; 16 ; 18	14,7 ; 15 ; 16 ; 18
DN 20	20	¾	¾	20	21 ; 22	20 ; 21 ; 22
DN 25	25	1	1	25	25 ; 27,4 ; 28	25 ; 27,4 ; 28
DN 32	32	1¼	1¼	32	34 ; 35	32 ; 34
DN 40	40	1½	1½	40	40 ; 40,5 ; 42	40 ; 40,5
DN 50	50	2	2	50	53,6 ; 54	50 ; 53,6
DN 65	65	2½	2½	-	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	-	-	-	-
DN 350	350	14	-	-	-	-
DN 400	400	16	-	-	-	-
DN 450	450	18	-	-	-	-
DN 500	500	20	-	-	-	-

4.1.3 PN and Class designations

The PN and Class designations applicable to valves having flanged, threaded and loose nut/union end 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 1333:2006.

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

NOTE 2 EN 1254-1:1998, EN 1254-2:1998, EN 1254-3:1998 and EN 1254-5:2007 which give details of the body ends for capillary and compression end valves in this European Standard, 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 — PN and Class designations

Body ends	PN 6	PN 10	PN 16	PN 20	PN 25	PN 32	PN 40	PN 63	Class 150	Class 300
Flanged	X	X	X	-	X	-	X	-	X	X
Threaded	-	X	X	X	X	X	X	X	-	-
Loose nut Union end	-	X	X	-	-	-	-	-	-	-

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 a lower allowable temperature than series A valves.

4.2 Design

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4.2.1 General

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.

4.2.2 Materials

The materials of construction of the valve shall be in accordance with Annex A.

4.2.3 Pressure/temperature ratings

Ratings shall be in accordance with Annex B.

4.2.4 Dimensions

4.2.4.1 Body ends

Body ends or the tailpiece of a valve with union end shall be selected from Table 5.

NOTE Valves may be supplied having body ends, which are a combination of any of the types given in Table 5.