BRITISH STANDARD

BS EN
1503-1:2000

Valves — Materials for bodies, bonnets and covers —

Part 1: Steels specified in European Standards

The European Standard EN 1503-1:2000 has the status of a British Standard

ICS 23.060.01; 77.140.30

National foreword

This British Standard is the official English language version of EN 1503-1:2000.

The UK participation in its preparation was entrusted by Technical Committee PSE/7, Industrial valves, to Subcommittee PSE/7/1, Basic valves, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 6, an inside back cover and a back cover.

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English version

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

Appareils de robinetterie - Matériaux pour les corps, chapeaux et couvercles - Partie 1: Aciers spécifiés dans les normes européennes

Armaturen - Werkstoffe für Gehäuse, Oberteile und Deckel - Teil 1: Stähle, die in Europäischen Normen festgelegt sind

This European Standard was approved by CEN on 6 October 2000.

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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.

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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 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 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

EN 1503 comprises four parts :

— Part 1 : Steels specified in European Standards ;

— Part 2 : Steels other than those specified in European Standards ;

— Part 3 : Cast irons specified in European Standards ;

— Part 4 : Copper alloys specified in European Standards.

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

This European Standard lists steels for pressure containing valve bodies, bonnets and covers which are given in European Standards.

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 incorporate in it by amendments or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

prEN 1092-1:1997, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges.*

EN 10025, *Hot rolled products of non-alloy structural steels - Technical delivery conditions (includes amendment A1: 1993)*

EN 10027-1, *Designation systems for steels - Part 1: Steel names, principal symbols*.

EN 10027-2, *Designation systems for steels - Part 2: Numerical system.*

EN 10028-2, *Flat products made of steels for pressure purposes - Part 2: Non-alloy and alloy steels with specified elevated temperature properties.*

EN 10028-3, *Flat products made of steels for pressure purposes - Part 3: Weldable fine grain steels, normalized.*

EN 10028-4, *Flat products made of steels for pressure purposes - Part 4: Nickel alloy steels with specified low temperature properties.*

EN 10028-7, *Flat products made of steels for pressure purposes - Part 7: Stainless steels.*

EN 10213-2, *Technical delivery conditions for steel castings for pressure purposes - Part 2: Steel grades for use at room temperature and elevated temperatures.*

EN 10213-3, *Technical delivery conditions for steel castings for pressure purposes - Part 3: Steel grades for use at low temperatures.*

EN 10213-4, *Technical delivery conditions for steel castings for pressure purposes - Part 4: Austenitic and austenitic-ferritic steel grades.*

EN 10222-2, *Steel forgings for pressure purposes - Part 2: Ferritic and martensitic steels with elevated temperature properties.*

EN 10222-3, *Steel forgings for pressure purposes - Part 3: Nickel steels with specified low temperature properties.*

EN 10222-4, *Steel forgings for pressure purposes - Part 4: Weldeable fine grain steels with high proof strength.*

EN 10222-5, *Steel forgings for pressure purposes - Part 5: Austenitic, martensitic and austenitic-ferritic stainless steels.*

CR 10260, *Designation systems for steels - Additional symbols.*

3 Materials

The materials shall be as given in Tables 1, 2 and 3. The designation of materials is given in accordance with EN 10027-1, EN 10027-2 and CR 10260.

Table 1 lists unalloyed steels, Table 2 low alloy steels and Table 3 high alloy steels.

The materials shall be used within the limits specified in the material standards. When the mechanical properties are only given for room temperature the limits of use shall be as specified in the relevant design standards (this requirement will be replaced by a reference to the European Standards about shell design strength as soon as these documents are published).

For the easy use of this standard, the materials have been divided into three temperature ranges in accordance with CR 10260 :

— R : Room temperature ;

— H : High temperature ;

— L : Low temperature.

Table 1 - Unalloyed steels

Line	Grouping based on R_e N/mm^2	Range of application	prEN 1092-1:1997 Material group	Forgings			Castings			Flat products			Tube			Bar		
				EN 10222 Part	Material grade	Material number	EN 10213 Part	Material grade	Material number	EN 10028 Part	Material grade	Material number	EN Part	Material grade	Material number	EN Part	Material grade	Material number
1	235	R	1 E 0	-	-	-	-	-	-	-	-	-	-	-	-	a	S235JR	1.0037
2	235	R	1 E 1	-	-	-	-	-	-	-	-	-	-	-	-	a	S235JRG2	1.0038
3	235	R	2 E 0	-	-	-	2	GP240GR	1.0621	-	-	-	-	-	-	-	-	-
4	275	R	8 E 0	-	-	-	-	-	-	3	P275N	1.0486	-	-	-	-	-	-
5	355	R	1 E 1	-	-	-	-	-	-	-	-	-	-	-	-	a	S355J2G3	1.0570
6	355	R	8 E 1	-	-	-	-	-	-	3	P355N	1.0562	-	-	-	-	-	-
7	235	H	3 E 0	2	P245GH	1.0352	2	GP240GH	1.0619	-	-	-	-	-	-	-	-	-
8	235	H	3 E 0	-	-	-	-	-	-	2	P265GH	1.0425	-	-	-	-	-	-
9	275	H	3 E 1	2	P280GH	1.0426	-	-	-	2	P295GH	1.0481	-	-	-	-	-	-
10	275	H	8 E 2	4	P285NH	1.0477	-	-	-	3	P275NH	1.0487	-	-	-	-	-	-
11	355	H	8 E 3	4	P355NH	1.0565	-	-	-	3	P355NH	1.0565	-	-	-	-	-	-
12	235	L	7 E 0	-	-	-	3	G17Mn5	1.1131	-	-	-	-	-	-	-	-	-
13	275	L	7 E 0	-	-	-	3	G20Mn5	1.6220	3	P275NL1	1.0488	-	-	-	-	-	-
14	275	L	7 E 0	-	-	-	-	-	-	3	P275NL2	1.1104	-	-	-	-	-	-
15	355	L	7 E 1	-	-	-	-	-	-	3	P355NL1	1.0566	-	-	-	-	-	-
16	355	L	7 E 1	-	-	-	-	-	-	3	P355NL2	1.1106	-	-	-	-	-	-

a EN 10025.

Table 2 - Low alloy steels

Line	Groupings based on chemical composition	Range of application	prEN 1092-1:1997 Material group	Forgings			Castings			Flat products			Tube			Bar		
				EN 10222 Part	Material grade	Material number	EN 10213 Part	Material grade	Material number	EN 10028 Part	Material grade	Material number	EN Part	Material grade	Material number	EN Part	Material grade	Material number
	C_{max}/Mn_{max}																	
1	0,16/1,2	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	0,20/1,4	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	0,16/1,5	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cr_{max}/Mo_{max}																	
4	0/0,5	H	4 E 0	2	16Mo3	1.5415	2	G20Mo5	1.5419	2	16Mo3	1.5415	-	-	-	-	-	-
5	1,0/0,5	H	5 E O	2	13CrMo4-5	1.7335	2	G17CrMo5-5	1.7357	2	13CrMo4-5	1.7335	-	-	-	-	-	-
6	2,25/1,0	H	6 E 0	2	11CrMo9-10	1.7383	2	G17CrMo9-10	1.7379	2	10CrMo9-10	1.7380	-	-	-	-	-	-
	Ni																	
7	Ni ≤ 0,5	L	7 E 0	-	-	-	-	-	-	4	11MnNi5-3	1.6212	-	-	-	-	-	-
8	Ni ≤ 0,5	L	7 E 0	3	13MnNi6-3	1.6217	-	-	-	4	13MnNi6-3	1.6217	-	-	-	-	-	-
9	0,5 < Ni ≤ 1,5	L	7 E 1	3	15NiMn6	1.6228	-	-	-	4	15NiMn6	1.6228	-	-	-	-	-	-
10	1,5 < Ni ≤ 3,5	L	7 E 1	3	12Ni14	1.5637	3	G9Ni14	1.5638	4	12Ni14	1.5637	-	-	-	-	-	-
11	3,5 < Ni ≤ 5,0	L	7 E 1	3	X12Ni5	1.5680	-	-	-	-	-	-	-	-	-	-	-	-

Table 3 - High alloy steels

Line	Grouping based on chemical composition	Range of application	prEN 1092-1:1997 Material group	Forgings			Castings			Flat products			Tube			Bar		
				EN 10222 Part	Material grade	Material number	EN 10213 Part	Material grade	Material number	EN 10028 Part	Material grade	Material number	EN Part	Material grade	Material number	EN Part	Material grade	Material number
	Ferritic																	
1	CrMo5-0,5	H	6 E 1	2	X16CrMo5-1	1.7366	2	GX15CrMo5	1.7365	-	-	-	-	-	-	-	-	-
2	CrMo12-1	H	9 E 0	2	X20CrMoV11-1	1.4922	2	GX23CrMoV12-1	1.4931	-	-	-	-	-	-	-	-	-
3	Ni9	L	7 E 2	3	X8Ni9	1.5662	-	-	-	4	X8Ni9	1.5662	-	-	-	-	-	-
	Austenitic																	
4	CrNiL	H	10 E 0	5	X2CrNi18-9	1.4307	4	GX2CrNi19-11	1.4309	7	X2CrNi19-11	1.4306	-	-	-	-	-	-
5	CrNi	H	11 E 0	5	X5CrNi18-10	1.4301	4	GX5CrNi19-10	1.4308	7	X5CrNi18-10	1.4301	-	-	-	-	-	-
6	CrNiTi	H	12 E 0	5	X6CrNiTi18-10	1.4541	-	-	-	7	X6CrNiTi18-10	1.4541	-	-	-	-	-	-
7	CrNiNb	H	12 E 0	5	X6CrNiNb18-10	1.4550	4	GX5CrNiNb19-11	1.4552	7	X6CrNiNb18-10	1.4550	-	-	-	-	-	-
8	CrNiMoL	H	13 E 0	5	X2CrNiMo17-12-2	1.4404	4	GX2CrNiMo19-11-2	1.4409	7	X2CrNiMo17-12-2	1.4404	-	-	-	-	-	-
9	CrNiMo	H	14 E 0	5	X5CrNiMo17-12-2	1.4401	4	GX5CrNiMo19-11-2	1.4408	7	X5CrNiMo17-12-2	1.4401	-	-	-	-	-	-
10	CrNiMoTi	H	15 E 0	5	X6CrNiMoTi17-12-2	1.4571	-	-	-	7	X6CrNiMoTi17-12-2	1.4571	-	-	-	-	-	-
11	CrNiMoNb	H	15 E 0	-	-	-	4	GX5CrNiMoNb19-11-2	1.4581	7	X6CrNiMoNb17-12-2	1.4580	-	-	-	-	-	-
Austenitic-ferritic (Duplex)																		
12	CrNiMo22-5-3	H	16 E 0	-	-	-	4	GX2CrNiMoCuN25-6-3-3	1.4517	-	-	-	-	-	-	-	-	-
13	CrNiMo25-7-4	H	16 E 0	-	-	-	4	GX2CrNiMoN26-7-4	1.4469	-	-	-	-	-	-	-	-	-

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