



**SLOVENSKI STANDARD**  
**SIST EN 13480-2:2002/A1:2011**  
**01-junij-2011**

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**Kovinski industrijski cevovodi - 2. del: Materiali - Dopolnilo A1**

Metallic industrial piping - Part 2: Materials

Metallische industrielle Rohrleitungen - Teil 2: Werkstoffe

Tuyauteries industrielles métalliques - Partie 2: Matériaux

**Ta slovenski standard je istoveten z: EN 13480-2:2002/A1:2010**

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**ICS:**

77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use
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**SIST EN 13480-2:2002/A1:2011**

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**EN 13480-2:2002/A1**

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## Metallic industrial piping - Part 2: Materials

Tuyauteries industrielles métalliques - Partie 2 : Matériaux

Metallische industrielle Rohrleitungen - Teil 2: Werkstoffe

This amendment A1 modifies the European Standard EN 13480-2:2002; it was approved by CEN on 16 April 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This amendment 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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## Foreword

This document (EN 13480-2:2002/A1:2010) has been prepared by Technical Committee CEN/TC 267 "Metallic industrial piping", the secretariat of which is held by AFNOR.

This Amendment to the European Standard EN 13480-3:2002 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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 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(s).

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

This document includes the text of the amendment itself. The corrected pages of EN 13480-2 will be delivered as issue 13 of the standard.

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 United Kingdom.

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**EN 13480-2:2002/A1:2010 (E)****Foreword**

*The text of the foreword shall include reference to EN 13480-8:*

Part 8: Additional requirements for aluminium and aluminium alloy piping

**4 Requirements for materials to be used for pressure-bearing parts**

*The text of 4.3.1 shall be changed to read as follows:*

**4.3.1 European Standards**

The European Standards for plates, strips, bars, tubes, forgings, fittings and castings for pressure purposes shall be used.

NOTE 1 Table D.1-1 provides an informative summary of European Materials Standards that are referred to in and of European Standards covering steel components of pressure parts.

NOTE 2 Table D.2-1 provides an informative summary regarding materials for pressure purposes specified in harmonised standards grouped according to product forms.

Special provisions due to fabrication and operation shall be taken into account, if appropriate.

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*The text of Annex A shall be rewritten as follows (see next pages):*

## Annex A (normative)

### Grouping system for steels for pressure equipment

Steels shall be grouped as shown in Table A.1. The figures given in group 1 are referring to the ladle analysis of the materials. The figures given in group 4 to 10 are based on the element content used in the designation of the alloys.

Table A.1 — Grouping system for steels (extract from CR ISO 15608:2000)

Group	Sub-group	Type of steel
1		Steels with a specified minimum yield strength $R_e \leq 460 \text{ N/mm}^2$ <sup>a</sup> and with analysis in %: $C \leq 0,25$ $Si \leq 0,60$ $Mn \leq 1,70$ $Mo \leq 0,70$ <sup>b</sup> $S \leq 0,045$ $P \leq 0,045$ $Cu \leq 0,40$ <sup>b</sup> $Ni \leq 0,5$ <sup>b</sup> $Cr \leq 0,3$ (0,4 for castings) <sup>p</sup> $Nb \leq 0,05$ $V \leq 0,12$ <sup>b</sup> $Ti \leq 0,05$
	1.1	Steels with a specified minimum yield strength $R_e \leq 275 \text{ N/mm}^2$
	1.2	Steels with a specified minimum yield strength $275 \text{ N/mm}^2 < R_e \leq 360 \text{ N/mm}^2$
	1.3	Normalised fine grain steels with a specified minimum yield strength $R_e > 360 \text{ N/mm}^2$
	1.4	Steels with improved atmospheric corrosion resistance whose analysis may exceed the requirements for the single elements as indicated under 1
2		Thermomechanically treated fine grain steels and cast steels with a specified minimum yield strength $R_e > 360 \text{ N/mm}^2$
	2.1	Thermomechanically treated fine grain steels and cast steels with a specified minimum yield strength $360 \text{ N/mm}^2 < R_e \leq 460 \text{ N/mm}^2$
	2.2	Thermomechanically treated fine grain steels and cast steels with a specified minimum yield strength $R_e > 460 \text{ N/mm}^2$
3		Quenched and tempered steels and precipitation hardened steels except stainless steels with a specified minimum yield strength $R_e > 360 \text{ N/mm}^2$
	3.1	Quenched and tempered steels with a specified minimum yield strength $360 \text{ N/mm}^2 < R_e \leq 690 \text{ N/mm}^2$
	3.2	Quenched and tempered steels with a specified minimum yield strength $R_e > 690 \text{ N/mm}^2$
	3.3	Precipitation hardened steels except stainless steels

## EN 13480-2:2002/A1:2010 (E)

Table A.1 (concluded)

Group	Sub-group	Type of steel
4		Low vanadium alloyed Cr-Mo-(Ni) steels with $Mo \leq 0,7 \%$ and $V \leq 0,1 \%$
	4.1	Steels with $Cr \leq 0,3 \%$ and $Ni \leq 0,7 \%$
	4.2	Steels with $Cr \leq 0,7 \%$ and $Ni \leq 1,5 \%$
5		Cr-Mo steels free of vanadium with $C \leq 0,35 \%$ <sup>c</sup>
	5.1	Steels with $0,75 \% \leq Cr \leq 1,5 \%$ and $Mo \leq 0,7 \%$
	5.2	Steels with $1,5 \% < Cr \leq 3,5 \%$ and $0,7 < Mo \leq 1,2 \%$
	5.3	Steels with $3,5 \% < Cr \leq 7,0 \%$ and $0,4 < Mo \leq 0,7 \%$
	5.4	Steels with $7,0 \% < Cr \leq 10 \%$ and $0,7 < Mo \leq 1,2 \%$
6		High vanadium alloyed Cr-Mo-(Ni) steels
	6.1	Steels with $0,3 \% \leq Cr \leq 0,75 \%$ , $Mo \leq 0,7 \%$ and $V \leq 0,35 \%$
	6.2	Steels with $0,75 \% < Cr \leq 3,5 \%$ , $0,7 \% < Mo \leq 1,2 \%$ and $V \leq 0,35 \%$
	6.3	Steels with $3,5 \% < Cr \leq 7,0 \%$ , $Mo \leq 0,7 \%$ and $0,45 \% \leq V \leq 0,55 \%$
	6.4	Steels with $7,0 \% < Cr \leq 12,5 \%$ , $0,7 \% < Mo \leq 1,2 \%$ and $V \leq 0,35 \%$
7		Ferritic, martensitic or precipitation hardened stainless steels with $C \leq 0,35 \%$ and $10,5 \% \leq Cr \leq 30 \%$
	7.1	Ferritic stainless steels
	7.2	Martensitic stainless steels
	7.3	Precipitation hardened stainless steels
8		Austenitic steels
	8.1	Austenitic stainless steels with $Cr \leq 19 \%$
	8.2	Austenitic stainless steels with $Cr > 19 \%$
	8.3	Manganese austenitic stainless steels with $4 \% < Mn \leq 12 \%$
9		Nickel alloyed steels with $Ni \leq 10 \%$
	9.1	Nickel alloyed steels with $Ni \leq 3 \%$
	9.2	Nickel alloyed steels with $3,0 \% < Ni \leq 8 \%$
	9.3	Nickel alloyed steels with $8,0 \% < Ni \leq 10 \%$
10		Austenitic ferritic stainless steels (duplex)
	10.1	Austenitic ferritic stainless steels with $Cr \leq 24 \%$
	10.2	Austenitic ferritic stainless steels with $Cr > 24 \%$

<sup>a</sup> In accordance with the specification of the steel product standards,  $R_c$  may be replaced by  $R_{p0,2}$  or  $R_{t0,5}$ .

<sup>b</sup> A higher value is accepted provided that  $Cr + Mo + Ni + Cu + V \leq 0,75 \%$ .

<sup>c</sup> "Free of vanadium" means not deliberately added to the material.

The Tables A.2 and A.3 shall be shifted into a new informative Annex D and shall be rewritten as follows:



## Annex D (informative)

### European steels for pressure purposes

#### D.1 European Standards for steels and steel components for pressure purposes

Table D.1-1 contains an informative summary on European Standards for steels and steel components for pressure purposes.

**Table D.1-1 — European Standards for steels and steel components for pressure purposes**

Product form	General requirements	Room temperature grades <sup>a</sup>	Elevated temperature grades	Fine grain steels			Low temperature grades	Stainless steels
				Normalised	Thermo-mechanically treated	Quenched and tempered		
Plate and strip	EN 10028-1	—	EN 10028-2	EN 10028-3	EN 10028-5	EN 10028-6	EN 10028-4	EN 10028-7
Rolled bar	—	—	EN 10273	—	—	—	—	EN 10272
Seamless tube	—	EN 10216-1	EN 10216-2	EN 10216-3	—	EN 10216-3	EN 10216-4	EN 10216-5
Electric welded tube	—	EN 10217-1	EN 10217-2	EN 10217-3	—	—	EN 10217-4	—
Submerged arc welded tube	—	EN 10217-1	EN 10217-5	EN 10217-3	—	—	EN 10217-6	—
Fusion welded tube	—	—	—	—	—	—	—	EN 10217-7
Fitting	—	EN 10253-2	EN 10253-2	EN 10253-2	EN 10253-2	EN 10253-2	EN 10253-2	EN 10253-4
Forging including forged bars	EN 10222-1	—	EN 10222-2	EN 10222-4	—	—	EN 10222-3	EN 10222-5
Casting	EN 10213	—	EN 10213	—	—	—	EN 10213	EN 10213
Steel for fastener	—	—	EN 10269	—	—	—	EN 10269	EN 10269

<sup>a</sup> Room temperature values are given in all standards of this table.

D.2 European standardised steels grouped according to product forms

Table D.2-1 — European standardised steels grouped according to product forms

1 No	2 Product form	3 European Standard	4 Material description	5 Grade	6 Material number	7 Heat treatment <sup>9</sup>	8 Thickness mm		9 Material group to CR ISO 15608	10 Notes
							min.	max.		
1	plate and strip	EN 10028-2	elevated temperature properties	P235GH	1.0345	N	0	250	1.1	
2	plate and strip	EN 10028-2	elevated temperature properties	P265GH	1.0425	N	0	250	1.1	
3	plate and strip	EN 10028-2	elevated temperature properties	P295GH	1.0481	N	0	250	1.2	
4	plate and strip	EN 10028-2	elevated temperature properties	P355GH	1.0473	N	0	250	1.2	
5	plate and strip	EN 10028-2	elevated temperature properties	16Mo3	1.5415	N, NT	0	250	1.2	e
6	plate and strip	EN 10028-2	elevated temperature properties	18MnMo4-5	1.5414	NT	0	150	1.2	
7	plate and strip	EN 10028-2	elevated temperature properties	18MnMo4-5	1.5414	QT	150	250	1.2	
8	plate and strip	EN 10028-2	elevated temperature properties	20MnMoNi4-5	1.6311	QT	0	250	3.1	
9	plate and strip	EN 10028-2	elevated temperature properties	15NiCuMoNb5-6-4	1.6368	NT	0	100	3.1	
10	plate and strip	EN 10028-2	elevated temperature properties	15NiCuMoNb5-6-4	1.6368	NT, QT	100	150	3.1	
11	plate and strip	EN 10028-2	elevated temperature properties	15NiCuMoNb5-6-4	1.6368	QT	150	200	3.1	
12	plate and strip	EN 10028-2	elevated temperature properties	13CrMo4-5	1.7335	NT	0	100	5.1	
13	plate and strip	EN 10028-2	elevated temperature properties	13CrMo4-5	1.7335	NT,QT	100	150	5.1	
14	plate and strip	EN 10028-2	elevated temperature properties	13CrMo4-5	1.7335	QT	150	250	5.1	
15	plate and strip	EN 10028-2	elevated temperature properties	13CrMoSi5-5	1.7336	NT, QT	0	100	5.1	
16	plate and strip	EN 10028-2	elevated temperature properties	13CrMoSi5-5	1.7336	QT	100	250	5.1	
17	plate and strip	EN 10028-2	elevated temperature properties	10CrMo9-10	1.7380	NT	0	60	5.2	
18	plate and strip	EN 10028-2	elevated temperature properties	10CrMo9-10	1.7380	NT,QT	60	100	5.2	

Table D.2-1 (continued)

1	2	3	4	5	6	7	8		9	10
No	Product form	European Standard	Material description	Grade	Material number	Heat treatment <sup>9</sup>	Thickness mm		Material group to CR ISO 15608	Notes
19	plate and strip	EN 10028-2	elevated temperature properties	10CrMo9-10	1.7380	QT	100	250	5.2	
20	plate and strip	EN 10028-2	elevated temperature properties	12CrMo9-10	1.7375	NT,QT	0	250	5.2	
21	plate and strip	EN 10028-2	elevated temperature properties	X12CrMo5	1.7362	NT	0	150	5.3	
22	plate and strip	EN 10028-2	elevated temperature properties	X12CrMo5	1.7362	QT	150	250	5.3	
23	plate and strip	EN 10028-2	elevated temperature properties	13CrMoV9-10	1.7703	NT	0	150	6.2	
24	plate and strip	EN 10028-2	elevated temperature properties	13CrMoV9-10	1.7703	QT	150	250	6.2	
25	plate and strip	EN 10028-2	elevated temperature properties	12CrMoV12-10	1.7767	NT	0	150	6.2	
26	plate and strip	EN 10028-2	elevated temperature properties	12CrMoV12-10	1.7767	QT	150	250	6.2	
27	plate and strip	EN 10028-2	elevated temperature properties	X10CrMoVNb9-1	1.4903	NT	0	150	6.4	
28	plate and strip	EN 10028-2	elevated temperature properties	X10CrMoVNb9-1	1.4903	QT	150	250	6.4	
29	plate and strip	EN 10028-3	fine grain steel normalised	P275NH	1.0487	N	0	250	1.1	
30	plate and strip	EN 10028-3	fine grain steel normalised	P275NL1	1.0488	N	0	250	1.1	
31	plate and strip	EN 10028-3	fine grain steel normalised	P275NL2	1.1104	N	0	250	1.1	
32	plate and strip	EN 10028-3	fine grain steel normalised	P355N	1.0562	N	0	250	1.2	
33	plate and strip	EN 10028-3	fine grain steel normalised	P355NH	1.0565	N	0	250	1.2	
34	plate and strip	EN 10028-3	fine grain steel normalised	P355NL1	1.0566	N	0	250	1.2	
35	plate and strip	EN 10028-3	fine grain steel normalised	P355NL2	1.1106	N	0	250	1.2	
36	plate and strip	EN 10028-3	fine grain steel normalised	P460NH	1.8935	N	0	100	1.3	
37	plate and strip	EN 10028-3	fine grain steel normalised	P460NL1	1.8915	N	0	100	1.3	
38	plate and strip	EN 10028-3	fine grain steel normalised	P460NL2	1.8918	N	0	100	1.3	

Table D.2-1 (continued)

1	2	3	4	5	6	7	8		9	10
No	Product form	European Standard	Material description	Grade	Material number	Heat treatment <sup>9</sup>	Thickness mm		Material group to CR ISO 15608	Notes
39	plate and strip	EN 10028-4	low temperature properties	11MnNi5-3	1.6212	N,NT	0	80	9.1	
40	plate and strip	EN 10028-4	low temperature properties	13MnNi6-3	1.6217	N,NT	0	80	9.1	
41	plate and strip	EN 10028-4	low temperature properties	15NiMn6	1.6228	N,NT,QT	0	80	9.1	
42	plate and strip	EN 10028-4	low temperature properties	12Ni14	1.5637	N,NT,QT	0	80	9.2	
43	plate and strip	EN 10028-4	low temperature properties	X12Ni5	1.5680	N,NT,QT	0	50	9.2	
44	plate and strip	EN 10028-4	low temperature properties	X8Ni9+NT640	1.5662	N+NT	0	50	9.3	
45	plate and strip	EN 10028-4	low temperature properties	X8Ni9+QT640	1.5662	QT	0	50	9.3	
46	plate and strip	EN 10028-4	low temperature properties	X8Ni9+QT680	1.5662	N+NT, QT	0	15	9.3	
47	plate and strip	EN 10028-4	low temperature properties	X8Ni9+QT680	1.5662	QT	15	50	9.3	
48	plate and strip	EN 10028-4	low temperature properties	X7Ni9	1.5663	N+NT, QT	0	15	9.3	
49	plate and strip	EN 10028-4	low temperature properties	X7Ni9	1.5663	QT	15	50	9.3	
50	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P355M	1.8821	M	0	63	1.2	f
51	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P355ML1	1.8832	M	0	63	1.2	f
52	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P355ML2	1.8833	M	0	63	1.2	f
53	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P420M	1.8824	M	0	63	2.1	f
54	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P420ML1	1.8835	M	0	63	2.1	f
55	plate and strip	EN 10028-5	fine grain steel, thermomechanically rolled	P420ML2	1.8828	M	0	63	2.1	f