SLOVENSKI STANDARD
SIST EN 13480-3:2012

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SIST EN 13480-3:2002
SIST EN 13480-3:2002/A1:2005
SIST EN 13480-3:2002/A2:2007
SIST EN 13480-3:2002/A3:2009
SIST EN 13480-3:2002/A4:2010
SIST EN 13480-3:2002/A5:2012

Kovinski industrijski cevovodi - 3. del: Konstruiranje in izračun

Metallic industrial piping - Part 3: Design and calculation

Metallische industrielle Rohrleitungen - Teil 3: Konstruktion und Berechnung

Tuyauteries industrielles métalliques - Partie 3: Conception et calcul

Ta slovenski standard je istoveten z: **EN 13480-3:2012**

ICS:

77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

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EUROPEAN STANDARD

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English Version

Metallic industrial piping - Part 3: Design and calculation

Tuyauteries industrielles métalliques - Partie 3: Conception et calcul

Metallische industrielle Rohrleitungen - Teil 3: Konstruktion und Berechnung

This European Standard was approved by CEN on 8 May 2012.

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

CEN members are the national standards bodies of 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, Turkey and United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 13480-3:2012) has been prepared by Technical Committee CEN/TC 267 “Industrial piping and pipelines”, 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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

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 EC Directive(s).

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

In this European Standard the Annexes A, C, F, G, I, K, L, M, P and Q are informative and the Annexes B, D, E, H, J, N and O are normative.

This European Standard EN 13480 for metallic industrial piping consists of eight interdependent and not dissociable Parts which are:

— *Part 1: General;*

— *Part 2: Materials;*

— *Part 3: Design and calculation;*

— *Part 4: Fabrication and installation;*

— *Part 5: Inspection and testing;*

— *Part 6: Additional requirements for buried piping;*

— CEN/TR 13480-7*: Guidance on the use of conformity assessment procedures;*

— *Part 8: Additional requirements for aluminium and aluminium alloy piping.*

Although these Parts may be obtained separately, it should be recognised that the Parts are interdependent. As such the manufacture of metallic industrial piping requires the application of all the relevant Parts in order for the requirements of the Standard to be satisfactorily fulfilled.

This European Standard will be maintained by a Maintenance MHD working group whose scope of working is limited to corrections and interpretations related to EN 13480.

The contact to submit queries can be found at http://portailgroupe.afnor.fr/public_espacenormalisation/CENTC267WG8/index.htm. A form for submitting questions can be downloaded from the link to the MHD website. After subject experts have agreed an answer, the answer will be communicated to the questioner. Corrected pages will be given specific issue number and issued by CEN according to CEN Rules. Interpretation sheets will be posted on the website of the MHD.

This document supersedes EN 13480-3:2002+A1:2005+A2:2006+A3:2009+A4:2010+A5:2012. This new edition incorporates the Amendments/the corrigenda which have been approved previously by CEN members, the corrected pages up to Issue 17 without any further technical change. Annex Y provides details of significant technical changes between this European Standard and the previous edition.

Amendments to this new edition may be issued from time to time and then used immediately as alternatives to rules contained herein. It is intended to deliver a new Issue of EN 13480:2012 each year, consolidating these Amendments and including other identified corrections.

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, Turkey and the United Kingdom.

1 Scope

This Part of this European Standard specifies the design and calculation of industrial metallic piping systems, including supports, covered by EN 13480.

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 287-1:2004+A2:2006, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 1515-2:2001, *Flanges and their joints — Bolting — Part 2: Combination of flange and bolting materials for steel flanges PN designated*

EN 1515-3:2005, *Flanges and their joints — Bolting — Part 3: Classification of bolt materials for steel flanges, Class designated*

EN 1515-4:2010, *Flanges and their joints — Bolting — Part 4: Selection of bolting for equipment subject to the Pressure Equipment Directive 97/23/EC*

EN 1591-1:2001+A1:2009+AC:2011, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*

EN 1591-2:2008, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 2: Gasket parameters*

EN 1993 (all parts), *Eurocode 3: Design of steel structures*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 12953-3:2002, *Shell boilers — Part 3: Design and calculation for pressure parts*

EN 13445-3:2009, *Unfired pressure vessels — Part 3: Design*

EN 13480-1:2012, *Metallic industrial piping — Part 1: General*

EN 13480-2:2012, *Metallic industrial piping — Part 2: Materials*

EN 13480-4:2012, *Metallic industrial piping — Part 4: Fabrication and installation*

EN 13480-5:2012, *Metallic industrial piping — Part 5: Inspection and testing*

EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys* (ISO 15614-1:2004)

EN ISO 5817:2007, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections* (ISO 5817:2003, corrected version:2005, including Technical Corrigendum 1:2006)

3 Terms, definitions, symbols and units

3.1 Terms and definitions

For the purposes of this Part of this European Standard, the terms and definitions given in EN 13480-1 apply.

3.2 Symbols and units

For the purposes of this Part of this European Standard, the symbols and units given in EN 13480-1 and in Table 3.2-1 apply.

Specific symbols are defined in the relevant sub-clauses.

Table 3.2-1 — General symbols and units

Symbol	Description	Unit
PS[a]	maximum allowable pressure	bar
R, r [b]	radii	mm
$R_{eH\,t}$	minimum specified value of upper yield strength at calculation temperature when this temperature is greater than the room temperature	MPa (N/mm²)
S_1	mean value of the stress which leads to a 1 % creep elongation in 100 000 h	MPa (N/mm²)
S_2	mean value of the stress which leads to a 1 % creep elongation in 200 000 h	MPa (N/mm²)
$S_{R\,T\,t}$	mean value of creep rupture strength as indicated by the standards, for the material in question at the considered temperature, *t*, and for the considered lifetime *T* (in hours) whereby the dispersion band of the results does not deviate by more than 20 % from the mean value.	MPa (N/mm²)
TS	maximum allowable temperature	°C
Z	section modulus for a pipe	mm^3
c_0	corrosion or erosion allowance (see Figure 4.3-1)	mm
c_1	absolute value of the negative tolerance taken from the material standard (see Figure 4.3-1)	mm
c_2	thinning allowance for possible thinning during manufacturing process (see Figure 4.3-1)	mm
e_a	analysis thickness of a component used for the check of the strength (see Figure 4.3-1)	mm
e_n	nominal thickness on drawings (see Figure 4.3-1)	mm
e_{ord}	ordered thickness (see Figure 4.3-1)	mm
e_r	minimum required thickness with allowances and tolerances (see Figure 4.3-1)	mm
f	design stress (see clause 5)	MPa (N/mm²)
f_{cr}	Design stress in the creep range	MPa (N/mm²)
f_f	Design stress for flexibility analysis	MPa (N/mm²)
p_c	calculation pressure (see 4.2.3.4)	MPa (N/mm²)
p_o	operating pressure (see 4.2.3.1)	MPa (N/mm²)
t_c	calculation temperature (see 4.2.3.5)	°C
t_o	operating temperature (see 4.2.3.2)	°C
z	joint coefficient (see 4.5)	-
ε	additional thickness resulting from the selection of the ordered thickness (see Figure 4.3-1)	mm

[a] All pressures for calculation purposes are in MPa (N/mm²) and *PS* is in bar.

[b] The following subscripts apply :

i inside

m mean

o outside