SLOVENSKI STANDARD
SIST EN 13480-3:2018/A1:2021

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Kovinski industrijski cevovodi - 3. del: Konstruiranje in izračun - Dopolnilo A1

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 13480-3:2017/A1:2021**

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

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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 amendment A1 modifies the European Standard EN 13480-3:2017; it was approved by CEN on 25 January 2021.

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European foreword

This document (EN 13480-3:2017/A1:2021) 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of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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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 amended/corrected pages of EN 13480-3:2017 will be published as Issue 2 of the European Standard.

1 Modifications to *European foreword*

In the European foreword, 8th paragraph shall read as follows:

"This document is maintained by a working group (Maintenance Help Desk - MHD) whose scope of work is limited to corrections and interpretations related to EN 13480.".

2 Modifications to Clause 2, Normative references

In Clause 2, the following normative reference shall be added:

EN 764-5:2014, *Pressure equipment - Part 5: Inspection documentation of metallic materials and compliance with the material specification*

In Clause 2, the following normative references shall be deleted:

EN 1591-1:2013, *Flanges and their joints - Design rules for gasketed circular flange connections - Part 1: Calculation*

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

3 Modifications to 3.2, *Symbols and units*

In Table 3.2-1, the following lines shall read as follows:

c_0	corrosion or erosion allowance (see Figure 4.3–1 and Figure 4.3–2)	mm
c_1	absolute value of the negative tolerance taken from the material standard (see Figure 4.3–1 and Figure 4.3–2)	mm
c_2	thinning allowance for possible thinning during manufacturing process (see Figure 4.3–1 and Figure 4.3–2)	mm
e_a	analysis thickness of a component used for the check of the strength (see Figure 4.3–1 and Figure 4.3–2)	mm
e_n	nominal thickness on drawings (see Figure 4.3–1 and Figure 4.3–2)	mm
e_{ord}	ordered thickness (see Figure 4.3–1 and Figure 4.3–2)	mm

4 Modifications to 4.2.3.4, *Calculation pressure*

NOTE 2 in subclause 4.2.3.4 shall read as follows:

"NOTE 2 If there is a condition where *pc = PS* and *tc =TS,* only this condition needs to be calculated.".

5 Modifications to 4.3, *Thickness*

In subclause 4.3, the order of the 3rd and 4th paragraphs shall be inverted.

6 Modifications to 4.6, *Dimensioning of piping components subject to pressure*

In subclause 4.6, 3rd paragraph shall read as follows:

"If the component under consideration is subjected to significant section moments resulting from connected piping, the rules of 12.4 shall apply.".

7 Modifications to 5.2.1, *Steels other than austenitic steels*

Subclause 5.2.1.2 shall read as follows:

"The designer shall ensure that the nominal design stress f_{test} under the proof test conditions, given in EN 13480-5, does not exceed 95 % R_{eH} or 95 % $R_{p0,2}$ at specified test temperature.".

8 Modifications to 5.2.4, *Steels castings*

Heading of subclause 5.2.4.2 shall read as follows:

"**5.2.4.2 Test conditions**"

9 Modifications to 5.2.5.1, *General*

The 1st sentence of 5.2.5.1 shall read as follows:

"Steels with no specific control are those possessing a test report 2.2 or a declaration of compliance with the order type 2.1, in accordance with EN 10204:2004. They shall only be used as permitted in EN 764-5:2014."

10 Modifications to 5.3.2.1, *Design conditions*

Table 5.3.2-1 shall read as follows:

Table 5.3.2–1 — Safety factor as a function of mean creep rupture strength related to time

Design lifetime[a]	Without surveillance of creep exhaustion[c]		With surveillance of creep exhaustion[c]	
T [h]	Mechanical property	Sf_{cr}	Mechanical property	Sf_{cr}
$10\,000 \le T \le 100\,000$	$S_{R\,T\,t}$	1,5	$S_{R\,T\,t}$	1,25
$100\,000 < T < 200\,000$	$S_{R\,T\,t}$ [d]	1,5[d]	$S_{R\,T\,t}$	1,25
$T = 200\,000$	$S_{R\,T\,t}$ [d]	1,5[d]	$S_{R\,200\,000\,h\,t}$ $S_{R\,150\,000\,h\,t}$ [b] $S_{R\,100\,000\,h\,t}$ [b]	1,25 1,35 1,5

[a] If the design lifetime is not specified, the mean creep rupture strength at 200 000 h shaII be used with the associated Sf_{cr}.

[b] Only in cases where the 200 000 h values are not specified in the material standards, the mean creep rupture strength at 150 000 h or 100 000 h shall be used for a design lifetime of 200 000 h with the associated Sf_{cr}.

[c] Surveillance by means of non-destructive testing and/or additional calculations of creep damage, D_c.

[d] Allowed only if $\frac{S_{R\,200000h\,t}}{S_{R\,100000h\,t}} \ge 0{,}781$ to ensure that 60 % of theoretical creep damage are not exceeded at 200 000 h.

11 Modifications to 6.2, *Pipe bends and elbows*

In subclause 6.2, 1st paragraph shall read as follows:

"There are two methods for calculating the wall thickness of elbows as well as the wall thickness of pipe bends (see 6.2.3.1 and 6.2.3.2). The chosen method shall be used in its entirety.".

Table 6.2.2-1 shall read as follows:

Table 6.2.2–1 — Additional symbols for the purposes of 6.2

Symbol	Description	Unit
e_{int}	minimum required thickness without allowances and tolerances for a bend on the intrados	mm
e_{ext}	minimum required thickness without allowances and tolerances for a bend on the extrados	mm
R	Bending radius of bend or elbow (center line)	mm

12 Modifications to 6.4.3, *Specific symbols and abbreviations*

Table 6.4.3-1 shall read as follows:

Table 6.4.3–1 — Additional symbols for the purposes of 6.4

Symbols	Description	Unit
D_c	the mean diameter of the cylinder at the junction with the cone	mm
D_e	the outside diameter of the cone	mm
D_i	the inside diameter of the cone	mm
D_K	a diameter given by Formula (6).4.4–7)	mm
D_m	the mean diameter of the cone	mm
e_{con}	required thickness of cone as determined in 6.4.4	mm
e_{cyl}	required thickness of cylinder as determined in 6.1	mm
e_j	a required or analysis thickness at a junction at the large end of a cone	mm
e_1	required thickness of cylinder at junction	mm
e_{1a}	analysis reinforcing thickness in cylinder	mm
e_2	required thickness of cone and knuckle at junction	mm
e_{2a}	analysis reinforcing thickness in cone	mm
f	the nominal design stress. In the design of junctions to 6.4.6 to 6.4.9 it is the lowest of values for the individual component parts values for the individual component parts	MPa (N/mm^2)
l_1	length along cylinder	mm
l_2	length along cone at large or small end	mm
r_i	inside radius of knuckle	mm
α	the semi angle of cone at apex	° (degrees)

β	a factor defined in 6.4.6	-
β_H	a factor defined in 6.4.8	-
γ	a factor defined in 6.4.7	-
ρ	a factor defined in 6.4.7	-
τ	a factor defined in 6.4.8	-

13 Modifications to 6.4.10, *Special forged reducers*

In Figures 6.4.10-1 and 6.4.10-2, l_i shall be replaced with l_l.

14 Modifications to 6.5.2, *Expansion joints*

The first paragraph of subclause 6.5.2 shall read as follows:

"A piping system containing a bellows expansion joint is critically dependent upon a proper combination of each and every component. This requires that detailed consideration shall be given to the system, its supports and anchors and their interaction with the bellows expansion joints."

15 Modifications to 6.6, *Bolted flange connections*

In subclause 6.6.1, replace the second paragraph by the following note:

NOTE If there is a specific requirement on tightness for the flange connection, this can be calculated in accordance with [4] and [5], recommended gaskets are specified in Annex P.

16 Modifications to 6.6.4, *Non-standard flange*

Subclause 6.6.4 shall read as follows:

"If a non-standard flange is used, the design shall be done by applying the calculation method in EN 13445-3:2014 or by applying the algorithm shown in the Taylor-Forge method (Annex D).

NOTE 1 The Taylor-Forge method does not ensure tightness. If there is a specific requirement on tightness for the flange connection, this can be calculated in accordance with [4] and [5], recommended gaskets are specified in Annex P.

NOTE 2 The algorithm given in [4] or EN 13445-3:2014 includes consideration of section loadings.

The bolt torque should be specified by the designer. Attention should be paid in such cases to the method of tightening. Guidance of scatter band when applying the different methods of tightening are given in [4] or EN 13445-3:2014".

17 Modifications to 7.1, *Dished ends*

In Table 7.1.1-1, the following lines shall read as follows:

e_{kn}	thickness of knuckle	mm
e_S	minimum thickness of end to limit membrane stress in spherical part	mm
h_i	inside height of ellipsoidal end	mm
r_i	inside knuckle radius	mm