

**METALLIST TÖÖSTUSTORUSTIK. OSA 3: KAVANDAMINE
JA ARVUTAMINE**

Metallic industrial piping - Part 3: Design and calculation

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13480-3:2017+A2+A3+A4+A5:2022 sisaldab Euroopa standardi EN 13480-3:2017 ja selle muudatuste A2:2020, A3:2020, A1:2021, A4:2021 ja A5:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 13480-3:2017+A2+A3+A4+A5:2022 consists of the English text of the European standard EN 13480-3:2017 and its amendments A2:2020, A3:2020, A1:2021, A4:2021 and A5:2022.
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English Version

Metallic industrial piping - Part 3: Design and calculation

Tuyauteries industrielles métalliques - Partie 3 :
Conception et calcul

Industrielle metallische Rohrleitungen - Teil 3:
Konstruktion und Berechnung

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This European Standard and its Amendments A2, A3, A1, A4 and A5 exist 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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COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	10
A₂ Amendment A2 European foreword	12
A₃ Amendment A3 European foreword	13
A₁ Amendment A1 European foreword	14
A₄ Amendment A4 European foreword	15
A₅ Amendment A5 European foreword	16
1 Scope	17
2 Normative references	17
3 Terms, definitions, symbols and units	18
3.1 Terms and definitions	18
3.2 Symbols and units	18
4 Basic design criteria.....	20
4.1 General.....	20
4.2 Loadings	20
4.2.1 General.....	20
4.2.2 Combination of loads	21
4.2.3 Loads for dimensioning	21
4.2.4 Other loads to be taken into account	23
4.2.5 Design conditions.....	24
4.3 Thickness	27
4.4 Tolerances	30
4.5 Joint coefficient.....	30
4.6 Dimensioning of piping components subject to pressure.....	31
5 Design stresses.....	31
5.1 General.....	31
5.2 Time-independent nominal design stress	32
5.2.1 Steels other than austenitic steels	32
5.2.2 Austenitic steels.....	32
5.2.3 Nickel and / or chromium alloy steels.....	33
5.2.4 A₃ Steels castings A₃	33
5.2.5 Additional requirements for steels with no specific control.....	33
5.3 Time-dependent nominal design stress	34
5.3.1 General.....	34
5.3.2 Steels.....	34
5.3.3 Nickel and/or chromium alloy steels.....	35
6 Design of piping components under internal pressure	35
6.1 Straight pipes.....	35
6.2 Pipe bends and elbows.....	35
6.2.1 General.....	35
6.2.2 Symbols.....	36
6.2.3 Required wall thicknesses.....	36
6.3 Mitre bends.....	37
6.3.1 General.....	37

6.3.2	Symbols	37
6.3.3	Effective radius of mitre bend	38
6.3.4	Multiple mitre bends	38
6.3.5	Single mitre bends	39
6.3.6	Adjacent straight pipe sections of mitre bends	39
6.4	Reducers	39
6.4.1	Conditions of applicability	39
6.4.2	Specific definitions	40
6.4.3	Specific symbols and abbreviations	40
6.4.4	Conical shells	41
6.4.5	Junctions - general	42
6.4.6	Junction between the large end of a cone and a cylinder without a knuckle	42
6.4.7	Junction between the large end of a cone and a cylinder with a knuckle	45
6.4.8	Junction between the small end of a cone and a cylinder	46
6.4.9	Offset reducers	48
6.4.10	Special forged reducers	48
6.5	Flexible piping components	49
6.5.1	General	49
6.5.2	Expansion joints	49
6.5.3	Corrugated metal hose assemblies	50
6.6	Bolted flange connections	52
6.6.1	General	52
6.6.2	Symbols	52
6.6.3	Standard flange	52
6.6.4	Non-standard flange	53
7	Design of ends under internal pressure	53
7.1	Dished ends	53
7.1.1	Symbols	53
7.1.2	Hemispherical ends	54
7.1.3	Torispherical ends	54
7.1.4	Ellipsoidal ends	56
7.1.5	Calculation of β	57
7.2	Circular flat ends	60
7.2.1	General	60
7.2.2	Symbols	60
7.2.3	Unstayed flat circular ends welded to cylindrical shells/pipes	61
7.2.4	Unstayed flat circular bolted ends	69
7.2.5	Reinforcements of openings in unstayed flat ends	74
8	Openings and branch connections	78
8.1	General	78
8.2	Symbols	78
8.3	Limitations	79
8.3.1	Thickness ratio	79
8.3.2	Openings in the vicinity of discontinuities	81
8.3.3	Types of reinforcement	83
8.3.4	Calculation method	83
8.3.5	Elliptical openings and oblique branch connections	83
8.3.6	Reinforcing pads	85
8.3.7	Dissimilar material of shell and reinforcements	86
8.3.8	Extruded outlets	86
8.3.9	Forged tee	86
8.3.10	Branches in bends or elbows	87

8.3.11	Screwed-in branches.....	87
8.4	Isolated openings	88
8.4.1	General.....	88
8.4.2	Unreinforced openings.....	91
8.4.3	Reinforced openings with $d_i/D_i < 0,8$	91
8.4.4	[A1] Reinforced single openings with $0,8 < d_i/D_i \leq 1,0$ [A1]	97
8.5	Adjacent openings.....	97
8.5.1	Unreinforced openings.....	97
8.5.2	[A1] Reinforced openings with $d_i/D_i \leq 0,8$ [A1]	97
8.6	Design of special piping components.....	98
8.6.1	Cylindrical Y-pieces	98
8.6.2	Spherical Y-pieces	99
8.6.3	Triform reinforced branches	100
9	Design of piping components under external pressure.....	101
9.1	[A5] General	101
9.1.1	External calculation pressure.....	101
9.1.2	Exception from verification against external pressure.....	102
9.1.3	General acceptance criteria [A5]	102
9.2	Symbols and elastic stress limits.....	103
9.2.1	Symbols.....	103
9.2.2	[A5] Stress limits [A5]	105
9.3	Cylindrical pipes, elbows and mitre bends	106
9.3.1	Determination of lengths	106
9.3.2	Interstiffener collapse	108
9.3.3	Overall collapse of stiffened pipes	109
9.3.4	Stiffener stability	110
9.3.5	Heating/cooling channels	114
9.4	Reducers (conical shells)	115
9.5	Dished ends	116
9.5.1	Hemispherical ends.....	116
9.5.2	Torispherical ends.....	117
9.5.3	Ellipsoidal ends.....	117
10	Design for cyclic loading	117
10.1	General.....	117
10.2	Exemption from detailed fatigue analysis	118
10.3	Fatigue design for cyclic pressure.....	118
10.3.1	Equivalent full load cycles.....	118
10.3.2	Simplified fatigue analysis.....	119
10.4	Fatigue design for thermal gradients	133
10.4.1	General.....	133
10.4.2	Design guidance.....	133
10.5	Fatigue design for combined loads	133
11	Integral attachments.....	134
11.1	General.....	134
11.2	Allowable stresses	134
11.3	Symbols.....	135
11.4	Hollow circular attachments.....	136
11.4.1	Limitations.....	136
11.4.2	Preliminary calculations	137
11.4.3	Analysis of attachments welded to pipe with a full penetration weld	139
11.4.4	Analysis of attachments welded to pipe with fillet or partial penetration weld	139

11.5	Rectangular attachments.....	139
11.5.1	Limitations.....	139
11.5.2	Preliminary calculations.....	140
11.5.3	Analysis of attachments welded to pipe with a full penetration weld.....	142
11.5.4	Analysis of attachments welded to pipe with fillet or partial penetration weld.....	142
11.6	Stress analysis of the run pipe.....	142
11.7	Shear stress analysis in attachment.....	144
11.7.1	Hollow circular attachments.....	144
11.7.2	Rectangular attachments.....	144
11.8	Alternative calculation methods.....	144
12	Flexibility analysis and acceptance criteria.....	145
12.1	Basic conditions.....	145
12.1.1	General.....	145
12.1.2	Loading conditions.....	145
12.1.3	Allowable stresses.....	145
12.2	Piping flexibility.....	147
12.2.1	General.....	147
12.2.2	Basic conditions.....	147
12.2.3	Displacement strains.....	147
12.2.4	Displacement stresses.....	148
12.2.5	Stress range.....	149
12.2.6	Cold pull.....	149
12.2.7	Properties for flexibility analysis.....	150
12.2.8	Supporting conditions.....	150
12.2.9	Expansion joints.....	151
12.2.10	Flexibility analysis.....	152
12.3	Flexibility analysis.....	154
12.3.1	$\square_{A2}$ General $\square_{A2}$	154
12.3.2	$\square_{A2}$ Stress due to sustained loads $\square_{A2}$	155
12.3.3	$\square_{A2}$ Stress due to sustained and occasional or exceptional loads $\square_{A2}$	156
12.3.4	$\square_{A2}$ Stress range due to thermal expansion and alternating loads $\square_{A2}$	157
12.3.5	$\square_{A2}$ Additional conditions for the creep range $\square_{A2}$	159
12.3.6	$\square_{A2}$ Stresses due to a single non-repeated support movement $\square_{A2}$	160
12.3.7	$\square_{A2}$ Determination of resultant moments $\square_{A2}$	161
12.3.8	Reactions.....	162
12.4	Fatigue analysis.....	162
12.5	Vibration.....	163
13	Pipe Supports.....	163
13.1	General requirements.....	163
13.1.1	General.....	163
13.1.2	Classification of supports.....	164
13.1.3	Additional definitions.....	164
13.1.4	Boundaries.....	166
13.1.5	Pipe supports welded to the pipe.....	168
13.2	Selection of pipe supports.....	169
13.2.1	General.....	169
13.2.2	Detail design of pipe supports.....	170
13.2.3	Support location.....	171
13.3	Constant hangers/base mounted (pedestal) constant supports.....	171
13.3.1	General.....	171
13.3.2	Load deviation from calibrated load.....	171
13.3.3	Site adjustment of the calibrated load.....	171

13.3.4	Travel reserve (Overtravel)	171
13.3.5	Blocking	171
13.3.6	Identification Marking/Name plate.....	172
13.4	Variable load spring hangers and base mounted (pedestal) variable load spring supports.....	172
13.4.1	General.....	172
13.4.2	Tolerance on spring rate	173
13.4.3	Travel reserve (Overtravel)	173
13.4.4	Blocking.....	173
13.4.5	Name plate.....	173
13.5	Rigid struts	174
13.6	Shock arrestors, shock absorber (snubber).....	174
13.7	Sliding supports.....	175
13.8	Anchors.....	175
13.9	Documentation of supports.....	175
13.10	Marking of supports.....	175
13.11	Ⓐ ₄ Design and manufacture of pipe supports Ⓐ ₄	175
13.11.1	Material requirements	175
13.11.2	Design temperatures for support components	176
13.11.3	Design details.....	177
13.11.4	Determination of component sizes	177
13.11.5	Welded connections	179
13.11.6	Ⓐ ₅ Bolted connections Ⓐ ₅	181
13.11.7	Additional requirements on springs	184
13.11.8	Design details for rigid struts.....	184
13.11.9	Ⓐ ₂ Design details for shock arrestors, shock absorbers (snubbers) Ⓐ ₂	184
13.11.10	Clamps for shock arrestors, rigid struts.....	185
13.11.11	Ⓐ ₄ Alternative rules for design and manufacture of pipe supports Ⓐ ₄	185
Ⓐ ₃	Annex A (informative) Dynamic effect.....	187
A.1	General.....	187
A.1.1	Introduction	187
A.1.2	Vibration design guidelines	187
A.2	Analysis by calculation.....	193
A.2.1	General.....	193
A.2.2	Seismic events	193
A.2.3	Rapid valve closure	198
A.2.4	Flow induced vibration	201
A.2.5	Safety valve discharge	204
A.2.6	Allowable stresses	206
A.2.7	Structural vibration properties	206
A.3	Alternative means of design verification.....	208
A.3.1	Comparative studies	208
A.3.2	Full scale testing.....	208
A.3.3	Reduced scale testing	209
A.4	Validation (measuring) Ⓐ ₃	209
	Annex B (normative) More accurate calculation of bends and elbows	210
B.1	General.....	210
B.2	Symbols and units	210
B.3	Required wall thickness	211
B.4	Calculation	212
B.4.1	Calculation of wall thickness.....	212
B.4.2	Stress calculation	214

Annex C (informative) Expansion joints	218
C.1 Incorporation of expansion joints into piping systems	218
C.1.1 General	218
C.1.2 Types of expansion joints	219
C.1.3 Design of expansion joints	219
C.1.4 Designing with expansion joints	220
C.1.5 Analyses and calculation	221
C.1.6 Cold pull	222
C.2 Maximum spacing for unrestrained axially compensated straight runs	222
C.2.1 General	222
C.2.2 Calculation rules	223
C.2.3 Maximum spacing for defined conditions	224
C.3 Indication for the design of expansion joints	225
C.3.1 General	225
C.3.2 Information for the system analyst	226
Annex D (normative) Flanges	227
D.1 Purpose	227
D.2 Specific terms and definitions	227
D.3 Specific symbols and abbreviations	228
D.4 General	229
D.4.1 Introduction	229
D.4.2 Use of standard flanges without calculation	229
D.4.3 Bolting	230
D.4.4 Flange construction	232
D.4.5 Machining	232
D.4.6 Gaskets	232
D.5 Narrow face gasketed flanges	233
D.5.1 General	233
D.5.2 Bolt loads and areas	236
D.5.3 Flange moments	237
D.5.4 Flange stresses and stress limits	237
D.5.5 Narrow face flanges subject to external pressure	243
D.5.6 Lap joints	243
D.5.7 Split ring flanges	246
D.6 Full face flanges with soft ring type gaskets	247
D.6.1 Specific symbols and abbreviations	247
D.6.2 Bolt loads and areas	248
D.6.3 Flange design	249
D.6.4 Full face flanges subject to external pressure	249
D.7 Seal welded flanges	249
D.8 Reverse narrow face flanges	250
D.8.1 Internal pressure	250
D.8.2 External pressure	253
D.9 Reverse full face flanges	253
D.9.1 General	253
D.9.2 Design following method of D.5	253
D.9.3 Design following method of D.6	255
D.10 Full face flanges with metal to metal contact	257
D.10.1 General	257
D.10.2 Specific symbols and abbreviations	257
D.10.3 Design	258
Annex E (normative) Design of branch connections in piping accessories	260

E.1	Scope	260
E.1.1	General	260
E.2	Reinforcement	262
E.2.1	Angles and areas	262
E.2.2	The following condition shall be satisfied:	262
E.3	Flexibility analysis	263
Annex F (informative)	Testing during operation in the case of cyclic loading	265
F.1	Testing during operation	265
F.2	Measures to be taken when the calculated fatigue life has been reached	265
Annex G (informative)	Physical properties of steels	266
G.1	General	266
G.2	Physical properties	266
G.2.1	Density	266
G.2.2	Differential coefficient of linear expansion	267
G.2.3	Specific thermal capacity	267
G.2.4	Thermal diffusivity	267
G.2.5	Poisson's ratio	267
G.3	Physical properties of steels	267
G.4	[A₃] Material properties of carbon steel (structural steel) at elevated temperatures [A₃]	273
[A₂] Annex H (normative)	Flexibility characteristics, flexibility and stress intensification factors and section moduli of piping components and geometrical discontinuities [A₂] ..	274
Annex I (informative)	Production testing of spring supports and shock arrestors (shock absorbers)	285
I.1	Constant load supports	285
I.2	Variable spring supports	285
I.3	Shock arrestors	285
Annex J (normative)	Type testing of support components	290
Annex K (informative)	Attachment of supports to structures	291
K.1	Attachment of supports to concrete structures	291
K.2	Attachment to metallic structures	292
K.2.1	Standard bolts	292
K.2.2	Friction grip bolts	292
K.2.3	Welding	292
Annex L (informative)	Buckling of linear type supports	293
L.1	General	293
L.2	Symbols	293
L.3	Basic formulae	294
L.4	Allowable compressive stress	294
L.5	Buckling length	295
Annex M (informative)	Design guidance for structural components	297
M.1	Linear type components subjected to bending	297
M.1.1	General	297
M.1.2	Supplementary verifications for linear type supports	297
M.2	Stability of plate type supports	299
M.3	Anchorage plates or equivalent anchorage components	299
M.3.1	General	299
M.3.2	Design of simple anchorage plates	299
M.3.3	Fixing plates with stiffening gussets	299

M.3.4 Load calculations for anchorages fixed in concrete	300
Annex N (normative) Documentation of supports	301
Annex O (normative) Alternative method for checking branch connections	304
O.1 Scope	304
O.2 Symbols	304
O.3 Design and checking of the branch connection	306
O.3.1 Limit value for the load due to pressure only for straight pipes without opening	306
O.3.2 Determination of the minimum thicknesses under loading due to pressure only	306
O.3.3 Checking of the thicknesses selected for the combination of pressure loading and loadings due to external loads	307
Annex P (informative) Recommended gaskets for industrial piping	358
Annex Q (informative) Simplified pipe stress analysis	360
Q.1 General	360
Q.2 Simplified procedure	360
Q.2.1 General	360
Q.2.2 Specification of allowable spacing of supports	360
Q.2.3 Check of elasticity	360
Q.3 Explanatory notes for Table Q.1	362
Q.4 Symbols	364
Q.5 Indices f_L	364
Q.6 Explanatory notes to Q.2.2	365
Q.6.1 Specification of allowable spacing of supports	365
Q.7 Conversion of the allowable lengths	366
Q.7.1 Other support conditions	366
Q.7.2 Other parameters	366
Q.8 Additional single loads	367
Q.8.1 General	367
Q.9 Explanatory note on Figure Q.2	369
Q.9.1 General	369
Q.9.2 Required pipe leg length L_1, for f_1 from the nomogram	372
Q.9.3 Required pipe leg length L_2, for f_2 from the nomogram	372
Annex R (informative) Surveillance of components operating in the creep range	377
R.1 General	377
R.2 Recording of operating data	377
R.3 Calculation of the creep exhaustion or the theoretical residual lifetime	377
R.4 Assessment of the cumulated creep	379
R.5 Review and repair of cracks	379
R.6 Creep and fatigue	379
R.7 Measures when reaching certain degrees of exhaustion $\sqrt{A_3}$	379
Annex Y (informative) History of EN 13480-3	380
Y.1 Differences between EN 13480-3:2012 and EN 13480-3:2017	380
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2014/68/EU aimed to be covered	382
Bibliography	383

European foreword

This document (EN 13480-3:2017) 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 2017, and conflicting national standards shall be withdrawn at the latest by December 2017.

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 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 inter-dependant. 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.

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This document supersedes EN 13480-3:2012. This new edition incorporates the Amendments which have been approved previously by CEN members, and the corrected pages up to Issue 5 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.

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A2 Amendment A2 European foreword

This document (EN 13480-3:2017/A2:2020) 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 February 2021, and conflicting national standards shall be withdrawn at the latest by February 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of EN 13480-3:2017.

This document includes the text of the amendment itself. The amended/corrected pages of EN 13480-3:2017 will be published as Issue 4 of the European Standard.

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A3 Amendment A3 European foreword

This document (EN 13480-3:2017/A3:2020) has been prepared by Technical Committee CEN/TC 267 “Industrial piping and pipelines”, the secretariat of which is held by AFNOR.

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A1 Amendment A1 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.

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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. **A1**

A4 Amendment A4 European foreword

This document (EN 13480-3:2017/A4:2021) has been prepared by Technical Committee CEN/TC 267 “Industrial piping and pipelines”, the secretariat of which is held by AFNOR.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of EN 13480-3:2017.

This document includes the text of the amendment itself. The amended/corrected pages of EN 13480-3:2017 will be published in the new Edition 2022 of the European Standard.

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A5 Amendment A5 European foreword

This document (EN 13480-3:2017/A5:2022) has been prepared by Technical Committee CEN/TC 267 “Industrial piping and pipelines”, the secretariat of which is held by AFNOR.

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This document includes the text of the amendment itself. The amended/corrected pages of EN 13480-3:2017 will be published in the new edition of the European Standard.

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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 764-5:2014, *Pressure equipment - Part 5: Inspection documentation of metallic materials and compliance with the material specification* ^{A1}

EN 1090-1:2009+A1:2011, *Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components*

EN 1090-2:2018, *Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures* ^{A4}

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 1515-5:2010, *Flanges and their joints — Bolting — Part 5: Selection of bolting for equipment subject to the Pressure Equipment Directive 97/23/EC* ^{A1}

EN 1990:2002, *Eurocode - Basis of structural design*

EN 1991 (all parts), *Eurocode 1: Actions on structures* ^{A4}

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

EN 1993-1-8:2005, *Eurocode 3: Design of steel structures — Part 1-8: Design of joints* ^{A5}

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

EN 10216-2:2013, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 12516-2:2014, *Industrial valves — Shell design strength — Part 2: Calculation method for steel valve shells* ^{A3}

EN 13445-3:2014, *Unfired pressure vessels — Part 3: Design*

EN 13480-1:2017, *Metallic industrial piping — Part 1: General*

EN 13480-2:2017, *Metallic industrial piping — Part 2: Materials*

EN 13480-4:2017, *Metallic industrial piping — Part 4: Fabrication and installation*

EN 13480-5:2017, *Metallic industrial piping — Part 5: Inspection and testing*

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
A	elongation at rupture	%
E	modulus of elasticity	MPa (N/mm ²)
$P_{\max}$	maximum pressure obtained from the design by formulae or relevant procedures for a given component	MPa (N/mm ²)
PS^a	maximum allowable pressure	bar
R, r^b	radii	mm
R_{eH}	minimum specified value of upper yield strength at room temperature	MPa (N/mm ²)
$R_{eH\ t}$	minimum specified value of upper yield strength at calculation temperature t^c	MPa (N/mm ²)
R_m	minimum specified value of tensile strength at room temperature	MPa (N/mm ²)
$R_{m\ t}$	minimum specified value of tensile strength at calculation temperature t^c	MPa (N/mm ²)
$R_{p0,2}$	minimum specified value of 0,2 % proof strength at room temperature	MPa (N/mm ²)
$R_{p0,2\ t}$	minimum specified value of 0,2 % proof strength at calculation temperature t^c	MPa (N/mm ²)
$R_{p1,0}$	minimum specified value of 1,0 % proof strength at room temperature	MPa (N/mm ²)
$R_{p1,0\ t}$	minimum specified value of 1,0 % proof strength at calculation temperature t^c	MPa (N/mm ²)