



SLOVENSKI STANDARD
SIST EN 13001-3-1:2025

01-maj-2025

**Dvigala (žerjavi) - Konstrukcija, splošno - 3-1. del: Mejna stanja in dokaz varnosti
jeklne nosilne konstrukcije**

Cranes - General design - Part 3-1: Limit states and proof of competence of steel structures

Krane - Konstruktion allgemein - Teil 3-1: Grenzzustände und Sicherheitsnachweis von Stahltragwerken

Appareils de levage à charge suspendue - Conception générale - Partie 3-1: États-limites et vérification d'aptitude des structures en acier

Ta slovenski standard je istoveten z: EN 13001-3-1:2025

[SIST EN 13001-3-1:2025](https://standards.iteh.ai/catalog/standards/sist/04d35a43-100a-496a-83a0-2d5c4258800/sist-en-13001-3-1-2025)

<https://standards.iteh.ai/catalog/standards/sist/04d35a43-100a-496a-83a0-2d5c4258800/sist-en-13001-3-1-2025>

ICS:

53.020.20 Dvigala Cranes

SIST EN 13001-3-1:2025 **en,fr**

EUROPEAN STANDARD

EN 13001-3-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2025

ICS 53.020.20

Supersedes EN 13001-3-1:2012+A2:2018

English Version

Cranes - General design - Part 3-1: Limit states and proof competence of steel structure

Appareils de levage à charge suspendue - Conception
générale - Partie 3-1 : Etats limites et vérification
d'aptitude des charpentes en acier

Krane - Konstruktion allgemein - Teil 3-1:
Grenzzustände und Sicherheitsnachweis von
Stahltragwerken

This European Standard was approved by CEN on 22 December 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a 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 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

<https://standards.iteh.ai>
SIST EN 13001-3-1:2025

<https://standards.iteh.ai/catalog/standards/sist/0dd35a43-160a-496a-a9a0-2d5e4f3bb604/sist-en-13001-3-1-2025>



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	5
Introduction	7
1 Scope.....	8
2 Normative references.....	8
3 Terms, definitions, symbols and abbreviations.....	9
3.1 Terms and definitions	9
3.2 Symbols and abbreviations	10
4 General.....	14
4.1 Documentation.....	14
4.2 Materials for structural members.....	14
4.2.1 Grades and qualities	14
4.2.2 Impact toughness	15
4.3 Bolted connections	17
4.3.1 Bolt materials	17
4.3.2 General.....	17
4.3.3 Shear and bearing connections.....	17
4.3.4 Friction grip type (slip resistant) connections.....	18
4.3.5 Connections loaded in tension	18
4.4 Pinned connections	18
4.5 Welded connections.....	19
4.6 Proof of competence for structural members and connections.....	19
5 Proof of static strength.....	20
5.1 General.....	20
5.2 Limit design stresses and forces.....	20
5.2.1 General.....	20
5.2.2 Limit design stress in structural members.....	20
5.2.3 Limit design forces in bolted connections	22
5.2.4 Limit design forces in pinned connections	30
5.2.5 Limit design stresses in welded connections.....	34
5.3 Execution of the proof	34
5.3.1 Proof for structural members.....	34
5.3.2 Proof for bolted connections.....	35
5.3.3 Proof for pinned connections	35
5.3.4 Proof for welded connections.....	36
6 Proof of fatigue strength.....	37
6.1 General.....	37
6.2 Assessment methods.....	38
6.2.1 Characteristic fatigue strength.....	38
6.2.2 Weld quality	39
6.2.3 Nominal stress method	40
6.2.4 Geometric stress method	41
6.2.5 Effective notch method.....	41
6.2.6 Requirements for fatigue testing for the nominal stress method	41
6.3 Stress histories.....	42

6.3.1	General	42
6.3.2	Frequency of occurrence of stress cycles.....	42
6.3.3	Stress history parameter	42
6.3.4	Stress history classes S	43
6.4	Execution of the proof.....	45
6.5	Determination of the limit design stress range.....	45
6.5.1	Applicable methods	45
6.5.2	Direct use of stress history parameter	45
6.5.3	Use of class S	46
6.5.4	Combined effect of normal and shear stresses.....	47
7	Proof of static strength of hollow section girder joints	48
8	Proof of elastic stability.....	48
8.1	General	48
8.2	Lateral buckling of members loaded in compression	48
8.2.1	Critical buckling load	48
8.2.2	Limit compressive design force.....	50
8.3	Buckling of plate fields subjected to compressive and shear stresses.....	52
8.3.1	General	52
8.3.2	Limit design stress with respect to longitudinal stress.....	54
8.3.3	Limit design stress with respect to transverse stress	56
8.3.4	Limit design stress with respect to shear stress	57
8.4	Lateral-torsional stability of beams.....	58
8.4.1	General	58
8.4.2	Limit design moment for lateral-torsional buckling	59
8.4.3	Reduction factor for lateral-torsional buckling – General case.....	59
8.4.4	Critical buckling moment in lateral-torsional buckling.....	61
8.5	Execution of the proof.....	62
8.5.1	Members loaded in compression.....	62
8.5.2	Plate fields.....	62
8.5.3	Lateral-torsional stability of beams.....	63
Annex A (informative) Limit design shear force $F_{v,Rd}$ per bolt and per shear plane for multiple shear plane connections		64
Annex B (informative) Preloaded bolts		65
B.1	General	65
B.2	Tightening torques.....	65
B.3	Limit design slip force $F_{S,Rd}$	67
Annex C (normative) Design weld stresses		68
C.1	General method.....	68
C.2	Simple examples	70
C.3	Reduction factor for long welds	71
C.4	Effective distribution length under concentrated load	72
C.5	Other types of welds	73
Annex D (normative) Values of slope constant m and characteristic fatigue strength $\Delta\sigma_c$, $\Delta\tau_c$		74
Annex E (normative) Sequence of notch classes (NC)		95
Annex F (informative) Evaluation of stress cycles (example).....		96

EN 13001-3-1:2025 (E)

Annex G (informative) Calculation of stiffnesses for connections loaded in tension.....	98
Annex H (normative) Hollow sections	101
Annex I (normative) Characteristic fatigue strengths for the geometric stress method and the effective notch method	113
Annex J (informative) General formula for elastic critical moment in lateral-torsional buckling of a simple beam	115
Annex K (informative) Selection of a suitable set of crane standards for a given application	118
Annex L (informative) List of hazards	119
Annex M (normative) Specific values of steels for structural members	120
Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered	122
Bibliography.....	123

iTeh Standards
 (<https://standards.iteh.ai>)
 Document Preview

[SIST EN 13001-3-1:2025](https://standards.iteh.ai/catalog/standards/sist/0dd35a43-160a-496a-a9a0-2d5e4f3bb604/sist-en-13001-3-1-2025)

<https://standards.iteh.ai/catalog/standards/sist/0dd35a43-160a-496a-a9a0-2d5e4f3bb604/sist-en-13001-3-1-2025>

European foreword

This document (EN 13001-3-1:2025) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by SFS.

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 2025, and conflicting national standards shall be withdrawn at the latest by September 2025.

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.

This document supersedes EN 13001-3-1:2012+A2:2018.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

CEN/TC 147 WG 2 has reviewed EN 13001-3-1:2012+A2:2018 to adapt the document to technical progress. The main changes are:

- design values for standardized steels (4.2.1) were moved to a new Annex M (normative);
- design values for bolt materials were changed (Table 4);
- limit design values for welded connection were changed (5.2.5);
- static proof of welded connections was changed (5.3.4 and Annex C (normative));
- proof of fatigue strength was revised to include additional modern methods (6.1);
- fatigue strength specific resistance factors were modified (Table 8);
- the geometric stress (Hot Spot) method was added (6.2.4 and Annex I (normative));
- the effective notch method was added (6.2.5 and Annex I (normative));
- lateral-torsional stability of beams was added (8.4 and 8.5.3 and Annex J (informative));
- recommended tightening torques for preloaded bolts were modified (Annex B (informative));
- characteristic fatigue strengths for plates in shear were modified (Table D.1);
- Annex L (informative) with a list of hazards was inserted;
- Annex ZA (informative) was significantly revised.