SLOVENSKI STANDARD
SIST EN 13001-3-2:2014/oprA1:2017

01-december-2017

Žerjavi - Konstrukcija, splošno - 3-2. del: Mejna stanja in dokaz varnosti jeklenih vrvi pri vrvnih pogonih

Cranes - General design - Part 3-2: Limit states and proof of competence of wire ropes in reeving systems

Krane - Konstruktion allgemein - Teil 3-2: Grenzzustände und Sicherheitsnachweis von Drahtseilen in Seiltrieben

Appareils de levage à charge suspendue - Conception générale - Partie 3-2 : Etats limites et vérification d'aptitude des câbles en acier mouflés

Ta slovenski standard je istoveten z: **EN 13001-3-2:2014/prA1**

ICS:

21.220.20	Vrvni pogoni in njihovi deli	Cable or rope drives and their components
53.020.20	Dvigala	Cranes

SIST EN 13001-3-2:2014/oprA1:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
EN 13001-3-2:2014

prA1

September 2017

ICS 21.220.20; 53.020.20

English Version

Cranes - General design - Part 3-2: Limit states and proof of competence of wire ropes in reeving systems

Appareils de levage à charge suspendue - Conception générale - Partie 3-2 : Etats limites et vérification d'aptitude des câbles en acier mouflés

Krane - Konstruktion allgemein - Teil 3-2: Grenzzustände und Sicherheitsnachweis von Drahtseilen in Seiltrieben

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 147.

This draft amendment A1, if approved, will modify the European Standard EN 13001-3-2:2014. If this draft becomes an amendment, 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.

This draft amendment was established by CEN 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (EN 13001-3-2:2014/prA1:2017) has been prepared by Technical Committee CEN/TC 147 “Cranes — Safety”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

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 of EN 13001-3-2:2014.

1 Modifications to the European foreword

After "This document supersedes" *replace the following part of the text:* "CEN/TS 13001-3-2:2008" *with* "EN 13001-3-2:2014".

After "The major changes in this document are in the following clauses:" *replace the first indent with the following:*

"

— 5.2.2.4 Load cases effects of dynamic cut-off and emergency cut-out are added in Table 2;

— 5.4;

— 6.3.3 Relationship between inspection intervals and number of ropes; and

— 6.5;".

In the 10th paragraph replace the 5th indent with the following:

"

— *Part 3-4: Limit states and proof of competence of machinery — Bearings*"

and after the 6th indent add:

"

— *Part 3-6: Limit states and proof of competence of machinery — Hydraulic cylinders*".

2 Modifications to Clause 2, "Normative references"

Delete the following references:

"EN 1990:2002, *Eurocode — Basis of structural design*"

"EN 13411-1, *Terminations for steel wire ropes — Safety — Part 1: Thimbles for steel wire rope slings*"

"EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire rope slings*"

Add the following reference:

"EN 13411-8, *Terminations for steel wire ropes — Safety — Part 8: Swage terminals and swaging*"

3 Modifications to 3.2, "Symbols and abbreviations"

Replace Table 1 with the following table:

"

Symbols, abbreviations	Description
a	Acceleration
C	Total number of working cycles (see EN 13001-1) during design life of crane
D	Relevant diameter
D_{drum}	Minimum pitch diameter of drum

Symbols, abbreviations	Description
D_{sheave}	Minimum pitch diameter of sheave
D_{comp}	Minimum pitch diameter of compensating sheave
d	Rope diameter
$d_{bearing}$	Diameter of bearing or shaft
F_{equ}	Equivalent force
F_{gd}	Part of F_{equ} induced by gravity, exclusive of mass of payload, amplified by γ_p
F_{gl}	Part of F_{equ} induced by gravity forces of mass of payload, amplified by γ_p
F_o	Part of F_{equ} induced by any other forces, amplified by γ_p
$F_{Rd,s}$	Limit design rope force for the proof of static strength
$F_{Rd,f}$	Limit design rope force for the proof of fatigue strength
$F_{Rd,m}$	Limit design rope force for multilayer drum
$F_{Sd,s}$	Design rope force for the proof of static strength
$F_{Sd,m}$	Design rope force for multilayer drum
F_r	Part of F_{equ} induced by resistances, amplified by γ_p
$F_{Sd,f}$	Design rope force for the proof of fatigue strength
F_t	Part of F_{equ} induced by rope tightening forces, amplified by γ_p
F_u	Minimum rope breaking force
F_w	Part of F_{equ} induced by wind forces, amplified by γ_p
f_f	Factor of further influences
f_{f1}	Factor of diameter ratio influence
f_{f2}	Factor tensile strength of wire influence
f_{f3}	Factor of fleet angle influence
f_{f4}	Factor of lubrication influence
f_{f6}	Factor of groove radius influence
f_{f7}	Factor of rope type influence
f_{S1}	Rope force increasing factor from rope reeving efficiency
f_{S2}	Rope force increasing factor from non parallel falls
f_{S3}	Rope force increasing factor from horizontal acceleration
f_{si}^*	Rope force increasing factors in fatigue
g	Acceleration due to gravity
i	Index for cycles of lifting and lowering

Symbols, abbreviations	Description
i_{max}	Total number of movements
kQ	Load spectrum factor (see EN 13001-1)
k_r	Rope force spectrum factor
l_r	Number of ropes used during design life of the crane
q	Normalized height distribution
m_H	Mass of hoist load (see EN 13001-1)
m_{Hr}	Mass of hoist load that is acting on the rope falls under consideration
m_r	Rotatory rope driven mass
m_t	Translational rope driven mass
n_s	Number of fixed sheave between drum and moving part
n_m	Mechanical advantage
n_r	Number of ropes reeved from a drum
R_0	Minimum tensile strength of the wire used in the rope
R_{Dd}	Reference ratio of rope bending diameter to rope diameter
R_r	Tensile strength level of wire
r_g	Groove radius
s_r	Rope force history parameter
t	Rope type factor
w	Number of relevant bendings per movement
w_c	Bending count
w_D	Number of bendings at reference point
w_{tot}	Calculated total number of bendings
z, z_i, z_{min}, z_{max}, z_{ref}	Height coordinates
α	Angle of slope
β, β_{max}	Angles between falls and line of acting force
γ	Angle between gravity and projected rope in plane of F_h and g
γ_n	Risk coefficient
γ_p	Partial safety factor
γ_{rb}	Minimum rope resistance factor (static)
γ_{rf}	Minimum rope resistance factor (fatigue)
δ	Design fleet angle

Symbols, abbreviations	Description
ε	Angle between sheave planes
η_s	Efficiency of single sheave
η_{tot}	Total rope reeving efficiency
ν_r	Relative total number of bendings
ϕ	Dynamic factor for inertial or gravity effects
ϕ^*	Dynamic factor for inertial or gravity effects in fatigue
ϕ_2	Dynamic factor for hoisting an unrestrained grounded load
ϕ_5	Dynamic factor for loads caused by acceleration
ϕ_6	Dynamic factor for test load
ϕ_L	Dynamic factor for cut-off of hoisting movement by lifting force limiter
ω	Angle between the sheave groove sides

”.

4 Modification to 4.4, "Rope and rope terminations"

Replace the following part of the text:

“EN 13411-1, EN 13411-2, EN 13411-3, EN 13411-4 and EN 13411-6”

with

“EN 13411-3, EN 13411-4, EN 13411-6 and EN 13411-8”.

5 Modification to 5.2.2.4, "Test load"

Replace the entire subclause with:

“**5.2.2.4 Exceptional loads**

— Test loads $\phi = \phi_6$ (5.1)

— Dynamic cut-off of hoisting movement by lifting force limiter $\phi = \phi_L$ (5.2)

— Emergency cut-out $\phi = \phi_5$ (5.3)

where

ϕ_6 is the dynamic factor for test load (see EN 13001-2);

ϕ_L is the dynamic factor for dynamic cut-off by lifting force limiter (see EN 13001-2);

ϕ_5 is the dynamic factor for emergency cut-out (see EN 13001-2).

”.