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DIN EN 13411-1:2002-05

Terminations for steel wire ropes – Safety – Part 1: Thimbles for steel wire rope slings (includes Amendment A1:2008) English version of DIN EN 13411-1:2009-02

Endverbindungen für Drahtseile aus Stahldraht – Sicherheit –
Teil 1: Kauschen für Anschlagseile aus Stahldrahtseilen (enthält Änderung A1:2008)
Englische Fassung DIN EN 13411-1:2009-02

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Start of validity

This standard takes effect on 1 February 2009.

DIN EN 13411-1:2002-05 may be used in parallel until 28 December 2009.

National foreword

Clause 5 of this standard includes safety requirements.

This standard has been prepared by Technical Committee CEN/TC 168 “Chains, ropes, webbing, slings and accessories – Safety” (Secretariat: BSI, United Kingdom).

The responsible German body involved in its preparation was the *Normenausschuss Stahldraht und Stahldrahterzeugnisse* (Steel Wire and Wire Products Standards Committee), Technical Committee NA 099-00-04 AA *Drahtseile, Seil-Endverbindungen und Anschlagseile.* For more detailed information about the *Normenausschuss Stahldraht und Stahldrahterzeugnisse* (NAD), please visit www.nad.din.de.

This standard includes Amendment A1:2008 to EN 13411-1:2002 and contains specifications meeting the essential requirements set out in Annex I of the “Machinery Directive”, Directive 98/37/EC (valid until 28 December 2009), and the “revised Machinery Directive”, Directive 2006/42/EC, which takes effect on 29 December 2009, and which apply to machines that are either first placed on the market or commissioned within the EEA. This standard serves to facilitate proof of compliance with the essential requirements of the directives.

Once this standard is cited in the Official Journal of the European Union, it is deemed a “harmonized” standard and thus, a manufacturer applying this standard may assume compliance with the requirements of the Machinery Directive (“presumption of conformity”).

Amendments

This standard differs from DIN EN 13411-1:2002-05 as follows:

a) Clause 7 b) has been modified.

b) Annex ZA (informative) “Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC” has been revised.

c) Annex ZB (informative) “Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC” has been added.

Previous editions

DIN 3090: 1977-07, 1989-08
DIN 6899: 1958-07, 1965-01
DIN EN 13411-1: 2002-05

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13411-1:2002+A1

October 2008

ICS 21.060.70; 53.020.30

Supersedes EN 13411-1:2002

English Version

Terminations for steel wire ropes - Safety - Part 1: Thimbles for steel wire rope slings

Terminaisons pour câbles en acier - Sécurité - Partie 1: Cosses pour élingues en câbles d'acier

Endverbindungen für Drahtseile aus Stahldraht - Sicherheit - Teil 1: Kauschen für Anschlagseile aus Stahldrahtseilen

This European Standard was approved by CEN on 11 November 2001 and includes Amendment 1 approved by CEN on 18 September 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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 and United Kingdom.

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

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Ref. No. EN 13411-1:2002+A1:2008: E

Foreword

This document (EN 13411-1:2002+A1:2008) has been prepared by Technical Committee CEN/TC 168 “Chains, ropes, webbing, slings and accessories - Safety”, the secretariat of which is held by BSI.

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 April 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document supersedes EN 13411-1:2002.

This document includes Amendment 1, approved by CEN on 2008-09-18.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

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).

⟨A1⟩ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A1⟩

The other Parts of this European Standard are:

Part 2: Splicing of eyes for steel wire rope slings
Part 3: Ferrule secured eyes
Part 4: Metal and resin socketing
Part 5: Wire rope grips for eyes
Part 6: Asymmetric wedge socket clevis
Part 7: Symmetric wedge socket clevis

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, 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 and United Kingdom.

Introduction

This European Standard has been prepared to provide a means of conforming with the essential safety requirements of the Machinery Directive and associated EFTA regulations.

Purchasers ordering to this standard are advised to specify in their purchasing contract that the supplier operates a certified quality assurance system applicable to the relevant part of this standard (e.g. EN ISO 9001) to ensure themselves that products claiming to comply consistently achieve the required level of quality.

While producing this standard it was assumed that negotiation occurs between the manufacturer and the user to decide whether the thimble shall have a pointed or truncated end and whether zinc coating is required.

1 Scope

This European Standard specifies the minimum requirements for non welded general purpose steel thimbles produced from plate having dimensions in accordance with Figure 1. The thimbles are intended to be used in slings made with six or eight strand steel wire ropes from 8 mm to 60 mm diameter complying with EN 12385-4.

Reeving thimbles and solid thimbles are not covered by this standard.

The hazards covered by this standard are identified in clause 4.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-2:1991/A1:1995, Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications (Amendment 1:1995).

EN 1050:1996, Safety of machinery - Principles for risk assessment.

EN 10025, Specification for hot rolled products of non-alloy structural steels - Technical delivery conditions (includes amendment A1:1993).

EN 12385-1:2002, Steel wire ropes – Safety - Part 1: General requirements.

prEN 12385-2, Steel wire ropes – Safety - Part 2: Definitions, designation and classification.

EN 12385-4:2002, Steel wire ropes – Safety - Part 4: Stranded ropes for general lifting applications.

3 Terms and definitions

For the purpose of this European Standard, the terms and definitions given in prEN 12385-2 together with the following apply.

3.1
nominal size (of a thimble)
size of the nominal diameter of the rope (*d*) for which the thimble has been primarily designed

4 Hazards

This clause contains the hazards and hazardous situations, as far as they are dealt with in this European Standard, identified by risk assessment significant for this type of machinery and which requires action to eliminate or reduce risk.

Accidental release of a load, or release of a load due to failure of a steel thimble puts at risk, either directly or indirectly, the safety or health of those persons within the danger zone.

In order to provide the necessary strength of steel thimble this standard gives requirements for the design, manufacture and testing to ensure the specified levels of performance are met.

Errors in the fitting of accessories can also lead to premature failure and this standard contains dimensional requirements to allow correct fit.

Table 1 contains all the hazards, which require action to reduce risk identified by risk assessment as being specific and significant for general purpose steel thimbles.

Table 1 — Hazards and associated requirements

Hazards identified in annex A of EN 1050:1996		Relevant clause of annex A of EN 292-2:1991/A1:1995	Relevant clause/subclause of this standard
1	Mechanical hazard due to inadequacy of strength	1.3.2 4.1.2.3 4.1.2.5 4.2.4	5 5 5 5.4
10.4	Errors of fitting hazard	1.5.4	5.1 5.2

5 Safety requirements and/or measures

5.1 Dimensions

The dimensions of any size of thimble shall comply with Figure 1.

5.2 Material

The material from which the thimbles are to be formed shall be steel conforming to EN 10025.

NOTE If the thimble is surface coated with zinc, the amount should be at least 120 g/m2 and should be applied in accordance with ISO 1461.

5.3 Construction

Thimbles shall be free from any flaws or defects.

NOTE A small gap at the joint may be tolerated.

NOTE 2 There is no requirement regarding whether thimbles should be pointed or not (see Figure 1), and this should be subjected to agreement between the purchaser and the manufacturer, see introduction.

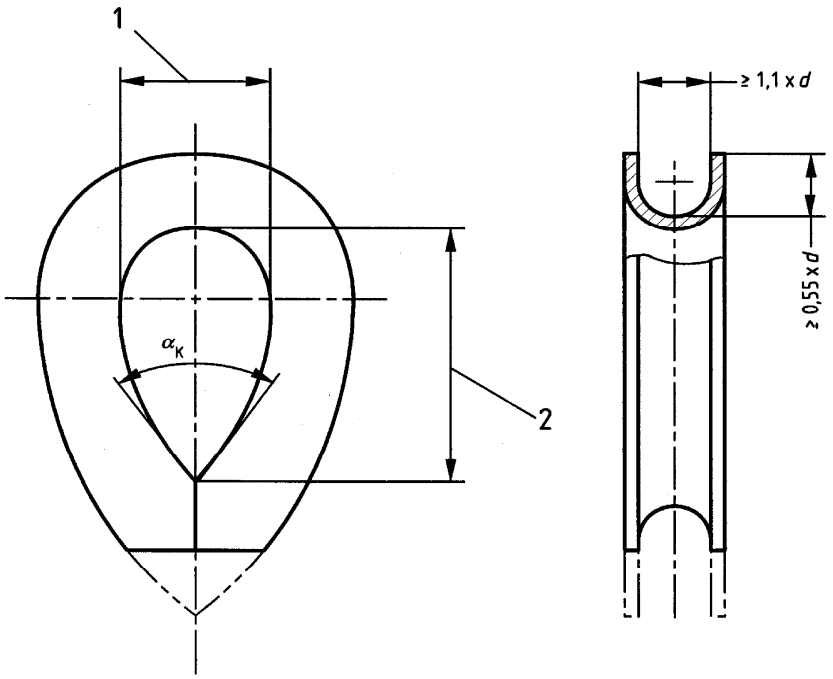
Thimbles shall be capable of being opened and closed once without the application of heat, wide enough to allow insertion of a component of 1,5 times the nominal rope diameter.

5.4 Type test

A type test shall demonstrate that the design, material and method of manufacture of the thimble having dimensions meeting the requirements of this standard can withstand the maximum loading conditions likely to be imposed upon it under normal conditions of use.

Any change, for example in the material specification, method of manufacture or critical dimensions, likely to affect the safety of the thimble, shall require that the type test in 6.1.2 be undertaken on the modified thimble.

After testing in accordance with 6.1.2 and with the load removed, any permanent reduction measured in dimension 1 of Figure 1 shall not exceed 15 % of its original value.



Key
1 2,5 to 3,5 x d
2 1,5 to 2 x dimension 1
d = nominal rope diameter
$\alpha_K \leq 50°$

Figure 1 — Thimble dimensions

6 Verification

6.1 Type test

6.1.1 Apparatus

6.1.1.1 Rope

The rope diameter shall be the same as the nominal size of the thimble. The rope construction shall be one from Table 6, 7, or 8 of EN 12385-4:2002 with a steel core. The rope grade shall be 1770.

6.1.1.2 Pin

The load shall be applied to the thimble through a pin having a diameter of 1,5 d.

6.1.2 Method

The method of test shall be in accordance with 6.4.1 of EN 12385-1:2002.

Carry out two tests on each size of thimble of each design, material and method of manufacture.

Fit the thimble to a rope of the size specified in 6.1.1.1 and load it axially to 27 % of the minimum breaking force of the rope as given in EN 12385-4:2002.

After release of the test load measure dimension ‘1’ of Figure 1 for any permanent reduction. The reduction shall not be greater than that specified in 5.4.

If any one thimble fails to pass, test a further two thimbles of the same size, design, material and method of manufacture. If these pass then the thimbles shall be deemed to have passed the type test.

If one or both fail the re-test or if both thimbles fail the original test, the thimbles shall be deemed to have failed the type test.

6.2 Dimensions

The linear dimensions of the thimble shall be measured with an instrument accurate to 0,1 mm and having a resolution of 0,01 mm. The measured dimension shall lie within the range specified in Figure 1. The angle shall be measured with an instrument accurate to 5º with a resolution of 1º.

6.3 Material

The suppliers records shall be used to verify the material used.

6.4 Construction

Thimbles shall be visually inspected for surface defects liable to injure the user or damage the rope.

7 Certificate

The manufacturer or supplier shall, on request, provide a certificate giving the following information:

a) a statement of conformance to this European Standard;

b) [A1] name and address of manufacturer or where applicable the authorized representative; [A1]

c) nominal size of thimble (rope diameter);

d) a means of referencing the certificate to the thimble.

Annex ZA
(informative)

A1 Relationship between this European standard and the Essential Requirements of EU Directive 98/37/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC amended by 98/79/CE on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING - Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. A1

Annex ZB
(informative)

A1 Relationship between this European standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING - Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. A1

Bibliography

ISO 1461, *Metallic coatings - Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods.*

ISO 6892, *Metallic materials - Tensile testing at ambient temperature.*

EN ISO 9001, *Quality management systems - Requirements (ISO 9001:2000).*