



# SLOVENSKI STANDARD

## SIST EN 13414-1:2004

01-junij-2004

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### Jeklene vrvne obese – Varnost – 1. del: Obese za splošne dvigalne potrebe

Steel wire rope slings - Safety - Part 1: Slings for general lifting service

Anschlagseile aus Stahldrahtseilen - Sicherheit - Teil 1: Anschlagseile für allgemeine Hebezwecke

Elingues de câbles en acier - Sécurité - Partie 1: Elingues pour applications générales de levage

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Ta slovenski standard je istoveten z: <sup>SIST EN 13414-1:2004</sup> **EN 13414-1:2003**

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#### **ICS:**

53.020.30	Pribor za dvigalno opremo	Accessories for lifting equipment
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English version

## Steel wire rope slings - Safety - Part 1: Slings for general lifting service

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This European Standard was approved by CEN on 26 June 2003.

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

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## Foreword

This document (EN 13414-1:2003) 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of an identical text or by endorsement, at the latest by February 2004, and conflicting national standards shall be withdrawn at the latest by February 2004.

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 EC Directive(s).

For relationship with EC Directives, see informative annex ZA, which is an integral part of this document.

The other Parts of this European Standard are:

Part 2: Specification for information for use and maintenance to be provided by the manufacturer  
Part 3: Grommets and cable-laid slings

This is the first edition of this Part of this standard.

Annexes A and B are informative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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## 0 Introduction

This European Standard has been prepared to be a harmonized standard providing a means of complying with the essential safety requirements of the Machinery Directive and associated EFTA regulations.

This European Standard is a type C standard as specified in EN 292.

While producing this standard it was assumed that negotiation occurs between the manufacturer and the user to decide whether sling eyes are to be spliced or ferrule-secured and whether a thimble is to be fitted. For endless slings it was assumed that negotiation occurs to decide whether the interlapping rope ends are to be spliced or ferrule-secured.

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

## 1 Scope

This European Standard specifies the construction requirements, calculation of WLL, verification, certification and marking of steel wire rope slings for general lifting service. It covers single-, two-, three- and four-leg slings, with ferrule-secured or spliced eye terminations and spliced or ferrule-secured endless slings made from 8 mm to 60 mm diameter 6 strand ordinary lay steel wire rope with fibre or steel core and 8 strand ordinary lay steel wire rope with a steel core conforming to EN 12385-4.

The standard assumes a working coefficient (factor of safety) of five.

This standard does not cover slings for single use, i.e. one trip slings.

This standard does not cover matched sets of slings with spliced eyes.

This document is not applicable to slings which are manufactured before the date of publication of this document by CEN.

The hazards covered by this Part of EN 13414 are identified in clause 4.

These wire rope slings are intended for lifting objects, materials or goods.

Guidance on the information which should be provided with an enquiry or order is given in annex A.

NOTE Information for use and maintenance, including operating temperature ranges, is given in Part 2 of this standard.

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## 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.*
- EN 1050:1996, *Safety of machinery – Principles for risk assessment.*
- EN 1677-1, *Components for slings – Safety – Part 1: Forged steel components – Grade 8.*
- EN 1677-2, *Components for slings – Safety – Part 2: Forged steel lifting hooks with latch – Grade 8.*
- EN 1677-3, *Components for slings – Safety – Part 3: Forged steel self-locking hooks – Grade 8.*
- EN 1677-4, *Components for slings – Safety – Part 4: Links – Grade 8.*
- EN 1677-5, *Components for slings – Safety – Part 5: Forged steel lifting hooks with latch – Grade 4.*
- EN 1677-6, *Components for slings – Safety – Part 6: Links - Grade 4.*
- EN 12385-1, *Steel wire ropes – Safety – Part 1: General requirements.*
- EN 12385-2:2002, *Steel wire ropes – Safety – Part 2: Definitions, designation and classification.*
- 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.*
- prEN 13411-3, *Terminations for steel wire ropes – Safety – Part 3: Ferrules and ferrule-securing.*
- EN 13889, *Forged steel shackles for general lifting purposes – Dee shackles and bow shackles – Grade 6 – Safety.*

## 3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in EN 12385-2:2002 and the following apply.

### 3.1

#### **steel wire rope sling for general lifting service**

assembly of components which includes one or more single part legs or an endless sling which is intended for a variety of lifting operations and not designed for one specific lifting application

### 3.2

#### **terminal fittings**

link, link assembly, hook or other device permanently fitted at the upper or lower end of a sling and intended to connect the sling to the load or the lifting machine

#### 3.2.1

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#### **master link**

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link forming the upper terminal of a sling by means of which the sling is attached to the hook of a crane or other lifting machine (see Figure 1)

#### 3.2.2

#### **intermediate master link**

link used to connect one or two legs of a sling to a master link (see Figure 1)

NOTE Intermediate links can be assembled with a master link to form a permanent master link assembly.

3.3

**working load limit (WLL) of a sling**

maximum mass which a sling is authorised to sustain in general service

3.4

**competent person**

designated person, suitably trained, qualified by knowledge and practical experience, and with the necessary instructions to enable the required tests and examination to be carried out

**4 Hazards**

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

Table 1 contains those hazards that require action to reduce risk identified by risk assessment as being specific and significant for wire rope slings.

**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 Part of prEN 13414
1	Mechanical hazard due to inadequacy of strength	4.1.2.3	5
		4.1.2.4	5
		4.1.2.5	5
		4.3.2	5
			7
10.4	Errors of fitting hazard	1.5.4	5

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## 5 Safety requirements and/or measures

### 1.1 General

#### 5.1.1 Grade of rope

The rope grade shall be either 1770 or 1960. When rope grade 1960 is used the working load limit shall be calculated on the basis of grade 1770.

#### 5.1.2 Formation of eyes

##### 5.1.2.1 Ferrule-secured eye slings

Ferrule secured eyes shall conform to prEN 13411-3.

The minimum length of plain rope between the inside ends of ferrules terminating a sling leg shall be 20 times the nominal rope diameter.

##### 5.1.2.2 Spliced eye slings

Spliced eyes shall conform to EN 13411-2.

The minimum length of plain rope between the tails of splices shall be at least 15 times the nominal rope diameter.

##### 5.1.2.3 Hard eyes

Hard eyes shall be fitted with thimbles conforming to EN 13411-1 and assembled in accordance with the FSET designer's instructions.

##### 5.1.2.4 Soft eyes

The peripheral length of a soft eye shall be at least four rope lay lengths.

NOTE A stirrup can be fitted to protect the bearing surface of the soft eye.

##### 5.1.2.5 Terminal fittings

The working load limit of any master link shall be at least equal to that of the sling.

The working load limit of any intermediate link fitted to a three-leg or four-leg sling shall be at least equal to 1,6 times the WLL of one of the legs suspended from it.

The working load limit of the lower terminal fitting(s) shall be at least equal to that of the leg(s) to which it is/they are fitted.

Where forged steel lifting hooks with latch – grade 8, forged steel self-locking hooks – grade 8, links – grade 8, forged steel lifting hooks with latch – grade 4, links – grade 4 are used, they shall conform to EN 1677 parts 2 to 6 respectively.

Where shackles are used they shall conform to EN 13889.

#### 5.1.3 Selection, use, inspection and discard

This standard shall be used in conjunction with Part 2 Information for use and maintenance to be provided by the manufacturer.

## 5.2 Single-leg sling

### 5.2.1 Types

Single-leg slings shall be one of the types shown in Table 2, with or without terminal fittings such as links or hooks. Where a terminal fitting is used, the eye termination shall always be fitted with a thimble.

### 5.2.2 Length

The length shall be that measured between the bearing points of the sling.

The measured length of a ferrule-secured sling shall not differ from the nominal length by more than two rope diameters or 1 % of the nominal length, whichever is the greater.

The measured length of a spliced sling shall not differ from the nominal length by more than four rope diameters or 2 % of the nominal length, whichever is the greater.

### 5.2.3 Length of matched sets

Where single leg slings are intended to be used as matched sets, the difference in length of matched sets of ferrule-secured eye slings shall not exceed the rope diameter, or 0,5 % of the nominal length, whichever is the greater.

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Table 2 — Examples of single-leg slings and terminal fittings

Form of sling leg			Terminal fittings		Nominal length of sling leg (bearing to bearing)	
Ferrule-secured hard eye	Hand spliced soft eye	Ferrule-secured soft eye with stirrup	Ferrule-secured soft eye	At upper end		At lower end
						
						