

SLOVENSKI STANDARD

SIST EN 13414-2:2004+A2:2008

01-december-2008

Nadomešča:

SIST EN 13414-2:2004/A1:2005

Jeklene vrvne obese - Varnost - 2. del: Doložila za proizvajalca navodila za uporabo in vzdrževanje

Steel wire rope slings - Safety - Part 2: Specification for information for use and maintenance to be provided by the manufacturer

Anschlagseile aus Strahldrahtseilen - Sicherheit - Teil 2: Vom Hersteller zu liefernde Informationen für Gebrauch und Instandhaltung

Élingues en câbles d'acier - Sécurité - Partie 2: Spécifications sur les informations à fournir par le fabricant concernant l'utilisation et la maintenance

Ta slovenski standard je istoveten z: EN 13414-2:2003+A2:2008

ICS:

53.020.30	Pribor za dvigalno opremo	Accessories for lifting equipment
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SIST EN 13414-2:2004+A2:2008	en,fr
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13414-2:2003+A2

October 2008

ICS 53.020.30

Supersedes EN 13414-2:2003

English Version

**Steel wire rope slings - Safety - Part 2: Specification for
information for use and maintenance to be provided by the
manufacturer**

Élingues en câbles d'acier - Sécurité - Partie 2:
Spécifications sur les informations à fournir par le fabricant
concernant l'utilisation et la maintenance

Anschlagseile aus Strahldrahtseilen - Sicherheit - Teil 2:
Vom Hersteller zu liefernde Informationen für Gebrauch
und Instandhaltung

This European Standard was approved by CEN on 25 March 2003 and includes Amendment 1 approved by CEN on 1 August 2005 and Amendment 2 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.

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Foreword

This document (EN 13414-2:2003+A2:2008) has been prepared by Technical Committee CEN/TC 168 "Chains, ropes, webbings, 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 13414-2:2003.

This document includes Amendment 1, approved by CEN on 2005-08-01 and Amendment 2, 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 $\boxed{A_1}$, $\triangleleft A_1$ and $\boxed{A_2}$, $\triangleleft A_2$.

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).

$\boxed{A_2}$ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. $\triangleleft A_2$

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The other parts of this European Standard are:

- Part 1: Slings for general lifting service [SIST EN 13414-2:2004+A2:2008](https://standards.iteh.ai/catalog/standards/sist/a2b301a5-4b17-4609-a60e-ae6f9c64f/sist-en-13414-2-2004a2-2008)
Part 3: Grommets and cable-laid slings <https://standards.iteh.ai/catalog/standards/sist/a2b301a5-4b17-4609-a60e-ae6f9c64f/sist-en-13414-2-2004a2-2008>

Annex A is informative.

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.

EN 13414-2:2003+A2:2008 (E)**Introduction**

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

The extent to which the hazards are covered is indicated in the scope.

1 Scope

This Part of EN 13414 specifies the information on use and maintenance to be provided by the manufacturer of wire rope slings.

NOTE Certain clauses are relevant to component parts and accessories conforming to EN 1677 parts 1 to 6

Annex A is informative, and provides some of the detailed information for use and maintenance which may be appropriate for general lifting service.

The hazards covered by this Part of EN13414 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 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.

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*

3 Terms and Definitions

For the purposes of this Part of EN13414 the definitions given in prEN13414 part 1 apply together with the following:

**3.1
inspection**

a visual check on the condition of the wire rope sling to identify obvious damage or deterioration which might affect its fitness for use

**3.2
thorough examination**

a visual examination carried out by a competent person, and where necessary, supplemented by other means, such as measurement and non-destructive testing, in order to detect damage or deterioration and to assess its importance in relation to the safety and continued safe use of the wire rope sling

4 Hazards

The release of a load due to the improper use or maintenance of a wire rope sling puts at risk either directly or indirectly the safety or health of those persons within the danger zone of lifting equipment.

Table 1 contains those hazards which require action to reduce risk identified by risk assessment as being specific or significant.

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 this Part of EN13414
26	Insufficient instructions for the user	1.7.4 3.6.3 b 4.4.1	5 (see also annex A)

5 Safety requirements

5.1 General

Instructions for use and maintenance shall be provided by the manufacturer covering the subjects listed in 5.2 to 5.5.

NOTE Informative annex A is an example of documented information to be provided by the manufacturer for the use and maintenance of wire rope slings for general lifting service.

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5.2 Limitations on the use of the wire rope sling due to adverse environmental conditions or hazardous conditions

Any limitations on the use of the wire rope sling due to the following shall be given:

- a) Adverse environments eg. chemical, temperature (see also A.1.2)
- b) Hazardous conditions (see also A.1.3)

5.3 Actions to be taken before putting the wire rope sling into first use

Information shall be given regarding the following (see also A.1.4):

- a) The intended use of the wire rope sling;
- b) The need to ensure the availability of the manufacturer's certificate;
- c) The need to enter full details of the sling in a register of slings;
- d)  The need to ensure that the identification and WLL of the sling corresponds to the information on the certificate. 

EN 13414-2:2003+A2:2008 (E)**5.4 Information regarding safe use of the wire rope sling**

Information regarding the following shall be provided.

- a) determination of the adequacy of the sling(s) to be used taking into account the mass of the load, its centre of gravity, attachment points and the method of attachment;
- b) checking of the conformity of the method of lifting and mass of the load to the working load limit specified by the manufacturer for the working configuration;
- c) attachment of wire rope sling to hook of lifting machine;
- d) attachment of wire rope sling to load: direct attachment, choke hitch, basket hitch, special components and associated forces;
- e) protection of wire rope sling and load;
- f) controlling rotation of load;
- g) ensuring even balance of the load;
- h) avoidance of shock loading;
- i) use of personal protective equipment;
- j) use of less than the full number of legs;
- k) preparation of landing place;
- l) detachment of wire rope sling from load;
- m) correct storage of wire rope sling;
- n) pre-use check before each use.

5.5 Thorough examination and maintenance

Information shall be given regarding the following:

- a) Withdrawal criteria;
- b) Records of examination, maintenance and repairs.

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Annex A (informative)

Example of documented information to be provided by the manufacturer for use and maintenance of wire rope slings for general lifting service

A.1 Use of wire rope slings

A.1.1 General

The adequacy of a wire rope sling should be checked to ensure that it is capable of lifting the load without releasing it.

Consideration should be given to the guidance in A.1.2 to A.1.5.

A.1.2 Use in adverse environments

A.1.2.1 High and low temperatures

Account should be taken of the maximum temperature that can be reached by the wire rope sling in service. This is difficult in practice but underestimation of the temperature should be avoided.

Table A.1 summarises the necessary de-rated working load limits of a sling due to temperature, taking into account the type of rope termination, the ferrule material and the core of the rope.

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Table A.1 — De-rated working load limit of slings due to temperature

Termination type	Ferrule material	Rope core	De-rated working load limit expressed as % of WLL of the sling					
			Temperature, T, °C					
			40<T≤100	100<T≤150	150<T≤200	200<T≤300	300<T≤400	400<T
Turn-back eye	Aluminium	Fibre	100	Do not use	Do not use	Do not use	Do not use	Do not use
Turn-back eye	Aluminium	Steel	100	100	Do not use	Do not use	Do not use	Do not use
Flemish eye	Steel	Fibre	100	Do not use	Do not use	Do not use	Do not use	Do not use
Flemish eye	Steel	Steel	100	100	90	75	65	Do not use
Hand splice	-	Fibre	100	Do not use	Do not use	Do not use	Do not use	Do not use
Hand splice	-	Steel	100	100	90	75	65	Do not use

The use of wire rope slings within the permissible temperature ranges given in table A.1 does not require any permanent reduction in working load limit when the rope is returned to ambient temperature.

Wire rope slings will not be adversely affected by temperatures down to -40°C and no reduction from the working load limit is necessary, therefore, on this account. Where wire rope slings are to be used at temperatures below -40°C the manufacturer should be consulted.

EN 13414-2:2003+A2:2008 (E)**A.1.2.2 Acidic conditions**

Wire rope slings should not be used either immersed in acidic solutions or exposed to acid fumes.

Attention is drawn to the fact that certain production processes involve acidic solutions, fumes and sprays and in these circumstances the manufacturer's advice should be sought.

A.1.2.3 Conditions in which the sling is likely to be subjected to attack (chemical, abrasive, etc.)

The manufacturer of the sling should be consulted, particularly if the sling is to be exposed to chemicals combined with high temperatures.

A.1.3 Use in hazardous conditions

The rating of slings for general lifting service excludes hazardous conditions including offshore activities, the lifting of persons and lifting of potentially dangerous loads such as molten metals, corrosive materials or fissile materials. In such cases the degree of hazard should be assessed by a competent person and the working load limit adjusted accordingly.

A.1.4 Actions to be taken before putting into first use

Before first use of the wire rope sling it should be ensured that:

- a) the sling is precisely as ordered;
- b) the manufacturer's certificate is to hand;
- c) the identification and working load limit marking on the sling correspond to the information on the certificate;
- d) full details of the sling are recorded in a register of slings;
- e) the actual use is to be as intended.

A.1.5 Information for safe use of the wire rope sling**A.1.5.1 Preparation**

Before starting the lift, it should be ensured that the load is free to move and is not bolted down or otherwise obstructed.

Packing may be required where a rope comes into contact with a load in order to protect either the rope or the load or both, since sharp corners of hard material may bend or damage the rope or, conversely, the rope may damage the load because of high contact pressure. Corner protection should be used to prevent such damage.

In order to prevent dangerous swaying of the load and to position it for loading, a tag line is recommended.

When loads are accelerated or decelerated suddenly, dynamic forces occur which increase the stresses in the rope. Such situations, which should be avoided, arise from snatch or shock loading e.g. from not taking up the slack rope before starting to lift.

A.1.5.2 Mass of the load

It is essential that the mass of the load to be lifted is known

A.1.5.3 Stability of the load when first raised

It is assumed that the attachment point of the hook is directly above the centre of gravity of the load. To lift the load the following conditions should be met:

For loads with attachment points

- a) For single-leg and single endless wire rope slings the attachment point should be vertically above the centre of gravity.
- b) For two-leg wire rope slings the attachment points should be either side of and above the centre of gravity.
- c) For three- and four-leg wire rope slings the attachment points should be distributed in plan around the centre of gravity. It is preferable that the distribution should be equal (but see A.1.5.6) and that the attachment points are above the centre of gravity.

If the attachment points using a) or b) are at or below the centre of gravity, other lifting arrangements should be used.

A.1.5.4 Angles for multi-leg slings

When using two-, three- and four-leg wire rope slings the attachment points and sling configuration should be selected to achieve angles between the sling legs and the vertical within the range marked on the sling. Preferably all angles to the vertical (angle β in figure A.1) should be equal (but see A.1.5.6). Angles to the vertical of less than 15° should be avoided if possible as they present a significantly greater risk of load imbalance.

All multi-leg slings exert a horizontal component of force (see figure A.1) which increases as the angle between the sling legs is increased. Care should always be taken to ensure that the load to be moved is able to resist the horizontal component of force without being damaged.

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