

Slynger af ståltov – Sikkerhed – Del 1: Slynger til almene løfteformål

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

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

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

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

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Contents

Page

Foreword.....3

Introduction4

1 Scope4

2 Normative references5

3 Terms and definitions5

4 Hazards6

Table 1 — Hazards and associated requirements.....6

5 Safety requirements and/or measures6

5.1 General.....6

5.2 Single-leg sling7

Table 2 — Examples of single-leg slings and terminal fittings.....9

5.3 Ferrule-secured and spliced endless slings.....10

5.4 Multi-leg sling.....11

Figure 1 — Multi-leg slings13

Table 3 — **A1** Working load limits for slings using fibre cored rope of classes 6x19 and 6x36 in grade 1770 and having ferrule-secured eye terminations **A1**.....14

Table 4 — **A1** Working load limits for slings using steel cored rope of classes 6x19, 6x36 and 8x36 in grade 1770 and having ferrule-secured eye terminations **A1**15

6 Verification of the safety requirements and/or measures16

6.1 Components of the wire rope sling.....16

6.2 Rope construction16

6.3 Length of the sling.....16

6.4 WLL of terminal fittings.....16

6.5 Formation of a multi-leg sling16

7 Information for use16

7.1 Marking16

7.2 Certification17

Annex A (informative) Information which should be supplied with an enquiry or order.....18

Annex B (informative) Rating of multi-leg slings for general service.....19

Annex ZA (informative) **A2** Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC **A2**.....20

Annex ZB (informative) **A2** Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC **A2**.....21

Bibliography22

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Foreword

This document (EN 13414-1:2003+A2:2008) 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 13414-1:2003.

This document includes Amendment 1, approved by CEN on 2005-04-29 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 **A1**, **A1** and **A2**, **A2**.

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).

A2 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A2**

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

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, 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 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.

A1 This standard does not cover slings for single use, i.e. one trip slings, having a working coefficient lower than 5. **A1**

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.

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.*

EN 13411-3 ^(A1), *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

master link

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

5 Safety requirements and/or measures

5.1 General

5.1.1 Grade of rope

Ⓐ The rope grade shall be either 1770 or 1960. Ⓐ

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.

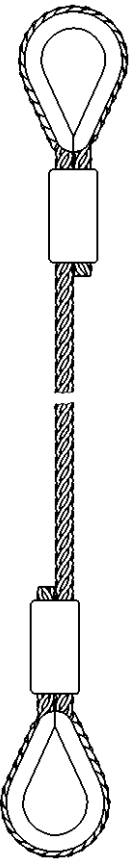
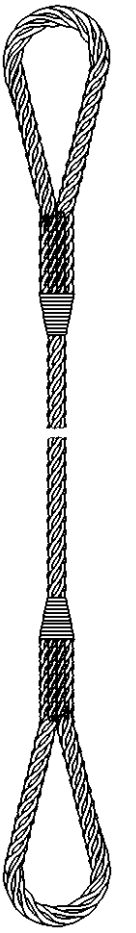
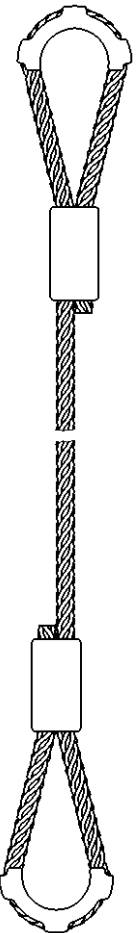
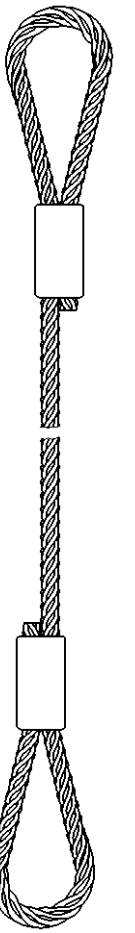

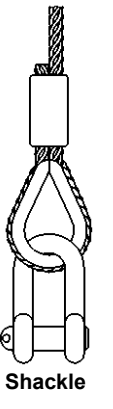
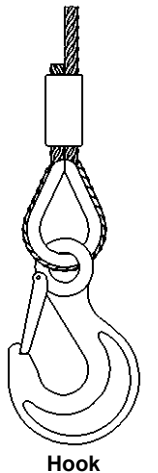
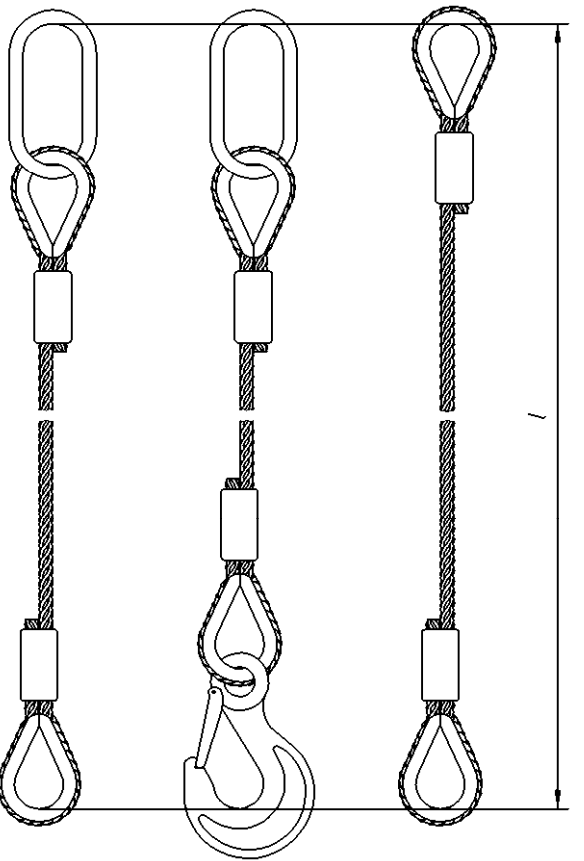

The measured length of a ferrule-secured sling shall not differ from the nominal length by more than two rope diameters or 1 % of the nominal length, whichever is the greater.

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.

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		
							
							

5.2.4 Working load limit (WLL) for single leg sling

The working load limit, WLL, in tonnes, as defined in 3.3 for a single-leg sling shall be calculated as follows:

$$WLL = \frac{F_{\min} \times K_T}{Z_p \times g}$$

where

F_{\min} is the minimum breaking force of the rope, in kilonewtons;

K_T is a factor which allows for the efficiency of the termination;

Z_p is the working coefficient and has the value = 5

NOTE The term working coefficient is also known as the coefficient of utilization.

g is the factor relating mass to force and has the value = 9,806 65.

For ferrule secured terminations K_T shall be 0,9 and for spliced terminations K_T shall be 0,8.

A1 Values of working load limits for the more common rope sizes in grade 1770 shall be in accordance with those given in Tables 3 and 4. **A1**

5.3 Ferrule-secured and spliced endless slings

5.3.1 Length

The length of an endless sling shall be that measured along its circumference on the centreline of the rope.

The measured circumferential length of an endless pressed sling measured under no load 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 an endless 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.

5.3.2 Ferrule-secured

An appropriate length of rope shall be selected and formed with overlapping ends. Two ferrules appropriate to the diameter of the rope shall be pressed in accordance with prEN 13411-3. The adjacent ends of the ferrules shall not be less than three times the length of the ferrule apart after pressing.

5.3.3 Spliced

The rope shall be formed into a circle such that the two ends overlap by the amount necessary for splicing. Each end shall be spliced back into the main body of the sling. The splicing operation shall be in accordance with EN 13411-2.

5.3.4 Working load limit (WLL) for an endless sling

The working load limit, WLL, in tonnes, as defined in 3.3 for an endless sling shall be calculated as follows:

$$WLL = \frac{F_{\min} \times 2 \times 0,8}{Z_p \times g}$$

where

F_{\min} is the minimum breaking force of the rope, in kilonewtons;

Z_p is the coefficient of utilization and has the value = 5

g is the factor relating mass to force and has the value = 9,806 65.

NOTE This calculation assumes that endless slings will normally be used in choke hitch (2 x 0,8). The effect of choke is the dominant factor and thus takes precedence over the termination efficiency since the factors are not cumulative.

Values of working load limits for the more common rope sizes shall be in accordance with those given in Tables 3 and 4.

5.4 Multi-leg sling

5.4.1 Length

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

The measured individual leg lengths shall not differ from the nominal length of the sling by more than two rope diameters or 1 % of the nominal length, whichever is the greater.

The difference in length between the individual legs of any multi-leg sling under no load shall not exceed 1,5 times the rope diameter or 0,5 % of the nominal length, whichever is the greater.

5.4.2 Length of matched sets

The difference in lengths of matched sets of ferrule-secured eye slings shall not exceed the rope diameter, or 0,5 % of the nominal lengths, whichever are the greater.

5.4.3 Formation of sling

The sling shall comprise two, three or four legs of the types specified in 5.2.1. The rope size type and grade for each leg shall be the same.

The legs of two-leg slings shall be joined at their upper ends by a master link (see Figure 1). In a three-leg sling, two of the legs shall be joined by a single intermediate master link to the master link, the third leg shall be connected via a second intermediate master link. In a four-leg sling each of the two pairs shall be joined by an intermediate master link to the master link.

Upper eyes shall always be fitted with thimbles, and if lower terminal fittings are used, the eyes shall always be fitted with thimbles. Thimbles shall conform to EN 13411-1.

NOTE Some typical sling assemblies are illustrated in Figure 1 for two-three- and four-leg slings. The lower terminal fittings can be any of those shown in Table 2.

5.4.4 Working load limit of multi-leg sling

The working load limit, in tonnes, for a multi-leg sling with symmetrically arranged legs with each leg making the same angle with the vertical shall be calculated as follows:

$$WLL = \frac{F_{\min} \times K_T \times K_L}{Z_p \times g}$$

where:

F_{\min} is the minimum breaking force of the rope, in kilonewtons;

Z_p is the coefficient of utilization and has the value = 5

g is the factor relating mass to force and has the value = 9,806 65.

K_L is the leg factor relating to the number of legs and the angle to the vertical (see Table 3).

K_T is a factor which allows for the efficiency of the termination.

For ferrule secured terminations K_T shall be 0,9 and for spliced terminations K_T shall be 0,8.

NOTE 1 For information on this method of rating see annex B.

NOTE 2 Tables 3 and 4 show working load limit values for ferrule-secured eye slings in various configurations.

Values of working load limits for the more common rope sizes shall be in accordance with those given in Tables 3 and 4.

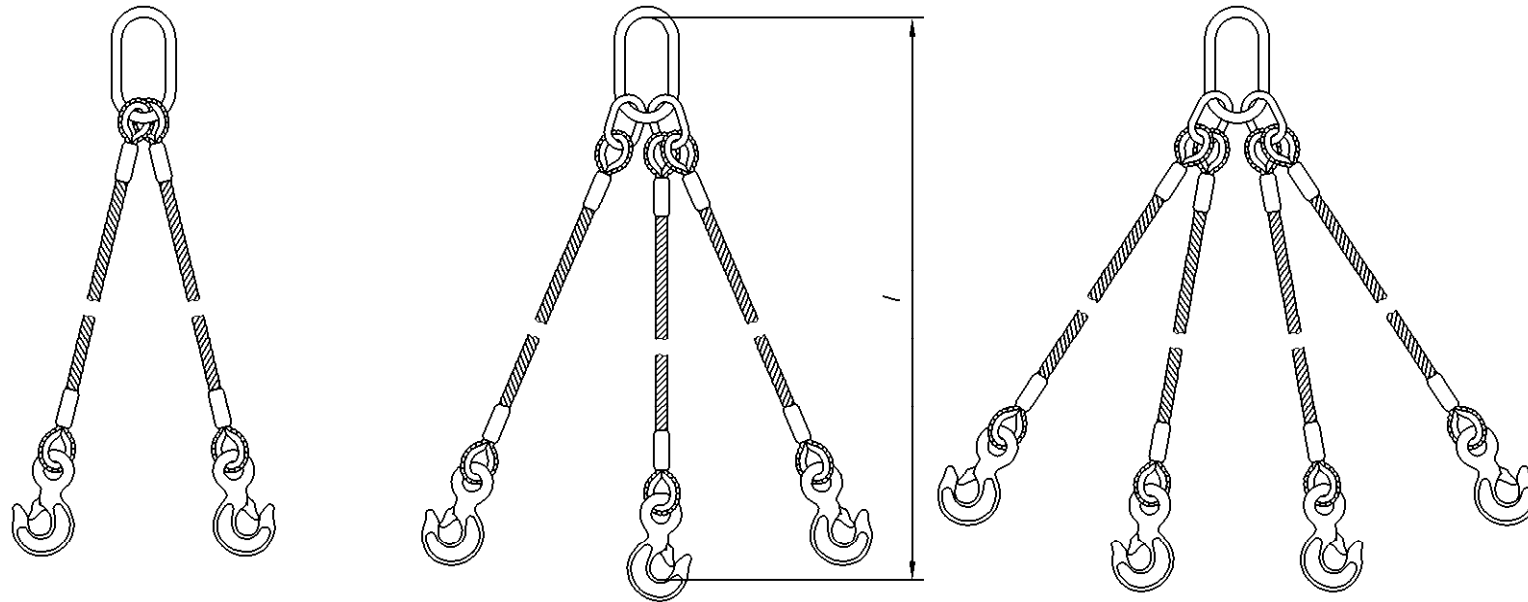

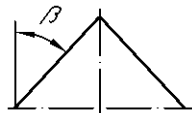
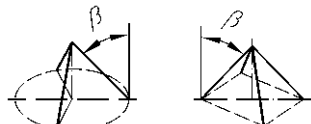



Figure 1 — Multi-leg slings


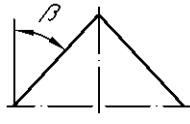
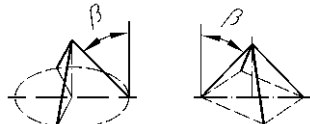

Table 3 — **A1** Working load limits for slings using fibre cored rope of classes 6x19 and 6x36 in grade 1770 and having ferrule-secured eye terminations **A1**

	One leg sling	Two leg sling		Three and four leg sling		Endless sling
Angle to the vertical	0°	0° to 45°	over 45° to 60°	0° to 45°	over 45° to 60°	0° -
						
	Direct	Direct	Direct	Direct	Direct	Choke hitch
Nominal rope diameter mm	Working load limits t					
8	0,700	0,950	0,700	1,50	1,05	1,10
9	0,850	1,20	0,850	1,80	1,30	1,40
10	1,05	1,50	1,05	2,25	1,60	1,70
11	1,30	1,80	1,30	2,70	1,95	2,12
12	1,55	2,12	1,55	3,30	2,30	2,50
13	1,80	2,50	1,80	3,85	2,70	2,90
14	2,12	3,00	2,12	4,35	3,15	3,30
16	2,70	3,85	2,70	5,65	4,20	4,35
18	3,40	4,80	3,40	7,20	5,20	5,65
20	4,35	6,00	4,35	9,00	6,50	6,90
22	5,20	7,20	5,20	11,0	7,80	8,40
24	6,30	8,80	6,30	13,5	9,40	10,0
26	7,20	10,0	7,20	15,0	11,0	11,8
28	8,40	11,8	8,40	18,0	12,5	13,5
32	11,0	15,0	11,0	23,5	16,5	18,0
36	14,0	19,0	14,0	29,0	21,0	22,5
40	17,0	23,5	17,0	36,0	26,0	28,0
44	21,0	29,0	21,0	44,0	31,5	33,5
48	25,0	35,0	25,0	52,0	37,0	40,0
52	29,0	40,0	29,0	62,0	44,0	47,0
56	33,5	47,0	33,5	71,0	50,0	54,0
60	39,0	54,0	39,0	81,0	58,0	63,0
Leg factor K_L	1	1,4	1	2,1	1,5	1,6

NOTE 1 The working load limits (WLLs) given in Table 3 are based on the assumption that soft eyes of single-leg slings are used over bearing points having diameters not less than twice the nominal diameter of the rope.

NOTE 2 Table 3 shows working load limit values for ferrule-secured eye slings in various configurations. These values, which are based on the equation given in 5.2.4, 5.3.4 and 5.4.4 have been rounded for the convenience of the user.

Table 4 — **A1** Working load limits for slings using steel cored rope of classes 6x19, 6x36 and 8x36 in grade 1770 and having ferrule-secured eye terminations **A1**

	One-leg sling	Two-leg sling		Three and four-leg sling		Endless sling
Angle to the vertical	0°	0° to 45°	over 45° to 60°	0° to 45°	over 45° to 60°	0° -
						
	Direct	Direct	Direct	Direct	Direct	Choke hitch
Nominal rope diameter mm	Working load limits					
	t					
8	0,750	1,05	0,750	1,55	1,10	1,20
9	0,950	1,30	0,950	2,00	1,40	1,50
10	1,15	1,60	1,15	2,40	1,70	1,85
11	1,40	2,00	1,40	3,00	2,12	2,25
12	1,70	2,30	1,70	3,55	2,50	2,70
13	2,00	2,80	2,00	4,15	3,00	3,15
14	2,25	3,15	2,25	4,80	3,40	3,70
16	3,00	4,20	3,00	6,30	4,50	4,80
18	3,70	5,20	3,70	7,80	5,65	6,00
20	4,60	6,50	4,60	9,80	6,90	7,35
22	5,65	7,80	5,65	11,8	8,40	9,00
24	6,70	9,40	6,70	14,0	10,0	10,6
26	7,80	11,0	7,80	16,5	11,5	12,5
28	9,00	12,5	9,00	19,0	13,5	14,5
32	11,8	16,5	11,8	25,0	17,5	19,0
36	15,0	21,0	15,0	31,5	22,5	23,5
40	18,5	26,0	18,5	39,0	28,0	30,0
44	22,5	31,5	22,5	47,0	33,5	36,0
48	26,0	37,0	26,0	55,0	40,0	42,0
52	31,5	44,0	31,5	66,0	47,0	50,0
56	36,0	50,0	36,0	76,0	54,0	58,0
60	42,0	58,0	42,0	88,0	63,0	67,0
leg factor K_L	1	1,4	1	2,1	1,5	1,6

NOTE 1 The working load limits (WLLs) given in Table 4 are based on the assumption that soft eyes of single-leg slings are used over bearing points having diameters not less than twice the nominal diameter of the rope.

NOTE 2 Table 4 shows working load limit values for ferrule-secured eye slings in various configurations. These values, which are based on the equation given in 5.2.4, 5.3.4 and 5.4.4 have been rounded for the convenience of the user.

6 Verification of the safety requirements and/or measures

6.1 Components of the wire rope sling

The suppliers records shall be used to confirm that the verification clauses of EN 12385-1, EN 1677 Parts 1 to 6, EN 13411-2 and prEN 13411-3 have been satisfied for the wire rope, hooks and links, and spliced and or ferrule secured terminations from which the sling is formed.

6.2 Rope construction

The suppliers records shall be used to verify the rope construction, diameter and grade of rope used.

6.3 Length of the sling

The lengths defined in 5.1.2.1, 5.1.2.2, 5.2.2, 5.2.3, 5.3.1, 5.4.1, and 5.4.2 shall be measured with a steel tape graduated in increments of 1 mm.

The length of a single leg sling and the length of the individual legs of multi-leg slings shall be measured without load and with the widths of soft eyes being approximately half their length.

6.4 WLL of terminal fittings

The suppliers records shall be used to verify the WLL of terminal fittings used in the construction of the sling.

6.5 Formation of a multi-leg sling

The requirements of 5.4.3 shall be confirmed by visual inspection.

7 Information for use

7.1 Marking

7.1.1 General

Each sling shall be legibly and durably marked with the information listed in 7.1.2 or 7.1.3

NOTE If the marking is on a load-bearing ferrule or the master link, care should be taken to ensure that the mechanical properties of the ferrule or link are not impaired.

7.1.2 Single-leg sling (single part or endless)

- a) The sling manufacturer's identifying mark;
- b) Numbers and/or letters identifying the sling with the certificate conforming to 7.2;
- c) The working load limit;
- d) Any legal marking.

NOTE Within the European Union this means CE marking.

7.1.3 Multi-leg sling

- a) The sling manufacturer's identifying mark;





- b) Number and/or letters identifying the sling with the certificate conforming to 7.2;
- c) The working load limits and the angles applicable, i.e. the WLL 0° to 45° to vertical and, additionally, the WLL 45° to 60° to the vertical if applicable;
- d) Any legal marking.

NOTE Within the European Union this means CE marking.

7.2 Certification

A certificate shall be supplied with each sling or batch of slings. This shall identify the sling with the certificate and include a statement that the sling conforms to this European Standard.

The certificate shall contain at least the following information.

- a)  The name and address of the manufacturer or where applicable the authorized representative. 
- b) The number and part of this European Standard; i.e. EN 13414-1.
- c) The description of the sling including all component parts.
- d) The WLL and the appropriate angle(s) to the vertical for multi-leg slings.
- e)  The static test coefficient(s) used for design of component(s) (e.g. hook; link; shackle). 

Annex A (informative)

Information which should be supplied with an enquiry or order

The following information should be supplied with an enquiry or order:

- a) The working load limit and for multi-leg slings the range of angles of use
- b) The number of this European Standard
- c) The type of sling (see Table 2)
- d) The number of legs (see Figure 1)
- e) The nominal length, in metres (see Figure 1)
- f) The terminal fittings (if any)
- g) Wire finish (zinc coated or bright)
- h) Type of rope core
- i) Diameter of rope (if required)
- j) Operating temperatures
- k) Special hazards e.g. chemical, environmental

Annex B (informative)

Rating of multi-leg slings for general service

It has been common practice in the past to calculate the working load limit of a multi-leg sling by reference to either prepared tables or basic mathematics taking account of the angle to the vertical which each leg of the sling subtends. Thus the working load limit of a sling rated by this method is a variable dependent on the angle to the vertical of each leg such that as the angle increases the working load limit of the sling decreases.

The method of rating slings for general service used in this standard removes the need for calculation or the use of tables since the sling has a fixed working load limit for a given range of angles. The working load limit of the sling does not increase as the angle to the vertical decreases. Hence a sling has a fixed working load limit at all angles between 0° and 45° and the same sling has a lesser working load limit at all angles between 45° and 60°.

Since the upper terminal of the sling assembly, e.g. a master link, will have been selected to match the stated working load limit of the sling, the sling should not be re-rated by the traditional method for angles smaller than the maximum quoted since the upper terminal will not be strong enough.

This method of rating assumes that each leg is at the same angle to vertical, that for three and four leg slings the legs are equally disposed when viewed in plan, and that all of the legs are in use. The WLL of a 4 leg sling is calculated assuming that one leg is redundant.

Annex ZA (informative)

A₂ 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. **A₂**

Annex ZB (informative)

A2 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. **A2**

Bibliography

- [1] EN 12385-4, *Steel wire ropes – Safety – Part 4: Stranded ropes for general lifting applications.*



Egne notater/Notes:

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