SLOVENSKI STANDARD
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Textile slings - Safety - Part 1: Flat woven webbing slings, made of man-made fibres, for general purpose use

Textile Anschlagmittel - Sicherheit - Teil 1: Flachgewebte Hebebänder aus Chemiefasern für allgemeine Verwendungszwecke

Elingues textiles - Sécurité - Partie 1: Élingues plates en sangles tissées, en textiles chimiques, d'usage courant

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This European Standard was approved by CEN on 25 June 2000.

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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 Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

This European Standard 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).

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard is one of a series of standards related to safety for textile slings as listed below:

Part 1: Specification for flat woven webbing slings, made of man-made fibres, for general purpose use

Part 2: Specification for roundslings, made of man-made fibres, for general purpose use

Part 4: Specification for lifting slings for general service made from natural and man-made fibre rope

This is the first edition of this Part of EN 1492.

In this standard:

Annex A is normative, and gives the test methods to be used to verify the safety requirements.

Annex B is normative, and gives the requirements for information on use and maintenance to be provided by the manufacturer with flat woven webbing slings conforming to this European Standard.

Annex C is informative, and gives guidance for the conduct of type tests in accordance with annex A.

Annex D is informative, and provides some detailed information for use and maintenance which may be appropriate in compiling the information in accordance with annex B.

Annex Z is informative, and gives the relationship with EU Directives.

Introduction

This European Standard has been prepared to be a harmonized standard providing one 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. The lifting accessories concerned and the extent to which hazards are covered is indicated in the scope of this standard.

> NOTE For hazards that are not covered by this standard, lifting accessories should be in accordance with EN 292.

1 Scope

This European Standard specifies the requirements related to safety, including methods of rating and testing single-, two-, three-, four-leg and endless sewn flat woven webbing slings, with or without fittings, made of polyamide, polyester and polypropylene man-made fibre webbing in the width range of 25 mm to 450 mm inclusive.

The flat woven webbing slings covered by this Part of EN 1492 are intended for general purpose lifting operations, i.e. when used for lifting objects, materials or goods which require no deviations from the requirements, safety factors or working load limits specified. Lifting operations not covered by this standard would include the lifting of persons, potentially dangerous materials such as molten metal and acids, glass sheets, fissile materials, nuclear reactors and where special conditions apply.

Flat woven webbing slings conforming to this European Standard are suitable for use and storage in the following temperature ranges:

a) polyester and polyamide -40°C to 100°C,

b) polypropylene -40°C to 80°C

This European Standard does not apply to the types of webbing sling indicated below:

a) slings such as bag slings, nets (consisting of several crossed webbings stitched together), 'adjustable' slings (containing, for example, intermediate buckles stitched along the webbing), etc.;

b) slings made from webbing woven from monofilament yarns;

c) slings designed for pre-slinging and intended not to be re-used;

This European Standard deals with the technical requirements to minimize the hazards listed in clause 4 which can arise during the use of flat woven webbing slings when carried out in accordance with the instructions and specifications given by the manufacturer or authorized representative.

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 of risk assessment
prEN 1677-1:2000	Components for slings – Safety - Part 1: Forged steel components, Grade 8

prEN 1677-2:2000	Components for slings – Safety - Part 2: Forged steel lifting hooks with latch, Grade 8
prEN 1677-3:1998	Components for slings – Safety - Part 3: Forged steel self-locking hooks, Grade 8
prEN 1677-4:1998	Components for slings – Safety - Part 4: Links, Grade 8
prEN 1677-5:1998	Components for slings – Safety - Part 5: Forged steel lifting hooks with latch, Grade 4
prEN 1677-6:1998	Components for slings – Safety - Part 6: Links, Grade 4
EN 10002-2: 1991	Metallic materials - Tensile testing - Part 2: Verification of the force measuring system of the tensile testing machines
EN 45012	General requirements for bodies operating assessment and certification/registration of quality systems (ISO/IEC Guide 62:1996)
EN ISO 5084: 1996	Textiles - Determination of thickness of textiles and textile products (ISO 5084:1996)
EN ISO 9002	Quality systems - Model for quality assurance in production, installation and servicing (ISO 9002:1994)

3 Terms and definitions

For the purposes of this standard, the following terms, definitions, symbols and abbreviations apply.

3.1

flat woven webbing sling

flexible sling consisting of a sewn webbing component, with or without fittings (see table 2), for attaching loads to the hook of a crane or other lifting machine.

3.2

multi-layer sling

flat woven webbing sling, the sewn webbing component or components of which consist of two or more layers of identical webbings superimposed in the lengthwise direction (See table 2).

3.3

multi-leg sling assembly

flat woven webbing sling assembly, consisting of two, three or four identical flat woven webbing slings attached to a master link (See table 3).

3.4

representative sling/representative sewn webbing component

flat woven webbing sling, or the sewn webbing component of a flat woven webbing sling, representative of each type or construction of sling, which is used for verification purposes (See 6.2. and 6.3).

NOTE This may differ from the production sling/sewn webbing component in length only

3.5

seam

method of securing the webbing to itself, securing several webbings to each other, or securing reinforcements to the webbing by means of stitches produced by the thread traversing the layers.

3.6

closed surface

webbing surface which, when visually and manually examined, appears closed, as is the case following thermofixing or colouring with additional substances, and where the single fibres support each other.

3.7

eye

termination of a sewn webbing component, produced by turning the end of the webbing through 180° and securing it to the standing part of the webbing by a loadbearing seam, so forming a terminal soft eye or attaching a terminal fitting.

3.8

soft eye

terminal eye of a sewn webbing component so formed as to allow reeving, the attachment of removable fittings or connection to the hook of a crane, other lifting machine or lifting accessory.

3.9

fitting

loadbearing metal component, supplied as part of a sling and which is used to terminate the sling so as to allow it to be reeved, attached to other lifting accessories, connected to other flat woven webbing slings to form a multi-leg sling assembly or connected to the hook of a crane or other lifting machine.

3.10

master link

link, or link assembly, forming the upper terminal fitting of a multi-leg sling assembly by means of which the sling assembly is attached to the hook of a crane, other lifting machine or lifting accessory.

3.11

nominal length

specified length of the sling, inclusive of fittings, from bearing point to bearing point (See table 1).

3.12

effective working length (EWL)

actual finished length of the flat woven webbing sling, inclusive of fittings, from bearing point to bearing point (See 5.7).

3.13

working load limit (WLL)

maximum mass which the sewn webbing component of a flat woven webbing sling is designed to sustain in straight pull and which a sling or sling assembly is authorized to sustain in general lifting service (See table 3).

3.14

mode factor (M)

factor applied to the WLL of a flat woven webbing sling in order to arrive at the WLL of a sling or sling assembly for a given mode of assembly or use.

3.15

competent person

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

NOTE 4.18 of EN ISO 9002:1994 gives guidance on training.

4 Hazards

The accidental release of a load, or release of a load due to failure of a component 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 and durability of lifting accessories this Part of EN 1492 specifies requirements for the design, manufacture and testing to ensure the specified levels of performance are met.

Endurance has not been identified as a hazard when flat woven webbing slings having the specified levels of performance given in this Part of EN 1492 are used in general lifting service.

Since failure can be caused by the incorrect choice of WLL and specification of lifting accessory this Part of EN 1492 also gives the requirements for marking and the manufacturer's certificate.

Aspects of safe use associated with good practice are given in annex B (normative) and annex D (informative) .

Table 1 lists those hazards in so far as they are dealt with in this standard that require action to reduce those risks identified by risk assessment as being specific and significant for flat woven webbing slings made of polyamide, polyester and polypropylene.

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 EN 1492
1.e)	Mechanical hazard due to inadequacy of strength	1.3.2	5
		4.1.2.3	5
		4.1.2.5	5
		4.2.4	6
		1.7.3	7
		4.3.2	7
		4.2.4	8
15	Errors of fitting hazard	1.5.4	5
17	Falling or ejected objects hazard	1.3.3	Annex B
26	Insufficient instructions for the driver/operator	1.7.4	9, annex B
		4.4.1	9, annex B
27.1.5	Inadequate holding devices/accessories hazard	4.4.1	5.14
27.6	Inadequate selection of lifting accessories hazard	4.1.2.5	5.14 and 6
		4.3.2	7

5 Safety requirements

5.1 Materials

The webbing shall be woven wholly from industrial yarns and certified by the manufacturer as being fast to light and heat-stabilized with a tenacity of not less than 60 cN/tex, from one of the following materials:

- polyamide (PA), high tenacity multifilament;

- polyester (PES), high tenacity multifilament;

- polypropylene (PP), high tenacity multifilament.

NOTE 1 The definitions for these are given in ISO 2076. The content of the constituent materials may be determined in accordance with ISO 1833.

NOTE 2 Attention is drawn to the different resistance of man-made fibres to chemicals, which are summarized in annex D.

5.2 Weaving

All yarns shall be of identical parent material (see 5.1).

Whether it is conventional or shuttleless woven, the webbing shall be woven with multiple piles, uniformly woven and the edges such that when one of the yarns breaks during weaving the ends cannot be pulled from the webbing causing it to unpick.

The method of weaving shall be such that the width of the finished sling changes by no more than -10 % for widths less than or equal to 100 mm, and -12% for widths over 100 mm, when a sample is tested in accordance with annex A.

5.3 Width

The width of the woven webbing, b (see figure 1), shall not be less than 25 mm and shall not exceed 450 mm and when measured with a steel tape or rule graduated in increments of 1 mm, shall have the following tolerances:

a) ± 10 % for nominal widths less than or equal to 100 mm;

b) ± 8 % for nominal widths greater than 100 mm.

5.4 Webbing thickness and sling thickness

For single layer flat woven webbing slings, the loadbearing element of the sling shall have a minimum thickness of 2 mm exclusive of any finishes or cast-on features. For multi-layer slings, the webbing used to provide each layer of the loadbearing element of the sling shall have a minimum thickness of 1,2 mm.

The thickness, s_1 (see figure 1), shall be measured in accordance with ISO 5084.

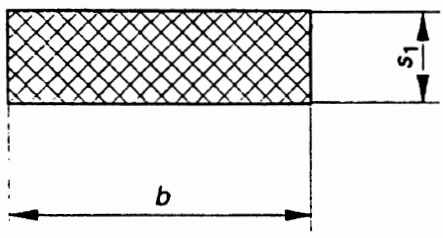

Figure 1 - Webbing width and thickness

5.5 Finishing and other treatments

The webbing forming the sewn webbing component shall be coloured (see 5.11).

The sewn webbing component shall be treated to produce a closed surface.

NOTE These treatments inhibit abrasion and the ingress of abrasive materials and may be applied to the webbing and/or the sewn webbing component and/or the yarn.

5.6 Sling types and designation

Endless flat woven webbing slings, type A, shall be made from 1 or 2 webbing layers. Single flat woven webbing slings with soft eyes, type B, and single flat woven webbing slings with metal fittings, type C, and/or reevable fittings, type Cr, shall be made from 1, 2, 3 or 4 layers. The designation shall give the type letter and number of layers, e.g. A2 (see table 2)

5.7 Effective working length (EWL)

The effective working length (EWL), l_1, of a flat woven webbing sling (see table 2) shall not differ from the nominal length by more than 3 % of the nominal length, when laid flat and measured with a steel tape or rule graduated in increments of 1 mm.

5.8 Sewing of slings

5.8.1 All seams shall be made from thread of identical parent material (see 5.1) as the webbing and shall be made with a locking stitch machine.

Stitches shall not touch or affect the edges of the webbing except those which secure the eye durability reinforcement.

NOTE The use of a different colour thread to that of the rest of the sling will facilitate inspection during the manufacturer's verification and in-service inspections by the user

5.8.2 The stitches of the seam shall traverse the parts of the webbing to be sewn together, and the stitching shall lay flat and not have loops above the surface of the webbing.

5.8.3 The ends of cut webbing shall be treated in such a way (e.g. fused by heating) as to prevent unravelling. Treatment of cut ends by heating shall not damage adjacent stitching, and heat-treated ends shall not be oversewn.

NOTE Where the webbing has been impregnated to prevent thread slippage, further treatment is not necessary, in which case the ends may be oversewn.