SLOVENSKI STANDARD
SIST EN 818-6:2001

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Kratkoļlene okrogle verige za dvigovalne namene - Varnost - 6. del: Obesne verige - Podatki in navodila za uporabo in vzdrģevanje, ki jih mora preskrbeti proizvajalec

Short link chain for lifting purposes - Safety - Part 6: Chain slings - Specification for information for use and maintenance to be provided by the manufacturer

Kurzgliedrige Rundstahlketten für Hebezwecke - Sicherheit - Teil 6: Anschlagketten - Festlegungen zu Informationen über Gebrauch und Instandhaltung, die vom Hersteller zur Verfügung zu stellen sind

Chaînes de levage a maillons courts - Sécurité - Partie 6: Elingues en chaînes - Spécification pour l'information sur l'utilisation et la maintenance qui doit etre fournie par le fabricant

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This European Standard was approved by CEN on 6 May 1999.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

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of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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.

The other Parts of EN 818 are:

Part 1: General conditions of acceptance
Part 2: Medium tolerance chain for chain slings - Grade 8
Part 3: Medium tolerance chain for chain slings - Grade 4
Part 4: Chain slings - Grade 8
Part 5: Chain slings - Grade 4
Part 7: Fine tolerance chain for hoists, Grade T (Types T, DT and DAT)

Annexes A and B of this European Standard are for information only.

Introduction

This European Standard has been prepared to be a harmonized 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 818 specifies the information on use and maintenance to be provided by the manufacturer with chain slings conforming to EN 818-4 and EN 818-5.

NOTE1: Certain clauses are relevant to component parts of chains and accessories conforming to EN 818-2, EN 818-3 and EN 1677.

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

The hazards covered by this Part of EN 818 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 818-1	Short link chain for lifting purposes - Safety Part 1: General conditions of acceptance
EN 818-2	Short link chain for lifting purposes - Safety Part 2: Medium tolerance chain for chain slings - Grade 8
EN 818-3	Short link chain for lifting purposes - Safety Part 3: Medium tolerance chain for chain slings - Grade 4
EN 818-4	Short link chain for lifting purposes - Safety Part 4: Chain slings - Grade 8
EN 818-5	Short link chain for lifting purposes - Safety Part 5: Chain slings - Grade 4
EN 1050: 1996	Safety of machinery - Principles of risk assessment

3 Terms and Definitions

For the purposes of this Part of EN 818 the definitions given in EN 818-1, EN 818-4 and EN 818-5 apply together with the following:

3.1 inspection: A visual check on the condition of the chain 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 non-destructive testing, in order to detect damage or deterioration which might affect the fitness for use of the chain sling.

4 Hazards

The release of a load due to failure of lifting accessories such as chain slings or their component parts puts at risk either directly or indirectly the safety or health of those persons within the danger zone of lifting equipment.

This Part of EN 818 lays down those aspects of safe use associated with good practice.

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 EN 818
26	Insufficient instructions for the driver/operator	1.7.4 3.6.3 b 4.4.1	5 and informative annex A 5 and informative annex A 5 and informative annex A

5 Safety requirements

5.1 General

Documented information shall be provided by the manufacturer covering the subjects listed in 5.2 to 5.6. Informative annex A contains guidance to assist in the preparation of this information.

5.2 Restriction on altering the finished condition on the chain sling

Any restrictions on alteration of the following shall be given:

a) Heat treatment
b) Galvanizing (see also A.1.1.2.2.1)
c) Plating
d) Coating

5.3 Limitations on the use of the chain sling due to adverse environmental conditions or hazardous conditions

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

a) Adverse environments (see also A.1.1.2)
b) Hazardous conditions (see also A.1.1.3)

5.4 Actions to be taken before putting the chain sling into first use

Instructions shall be given regarding the following (see also A.1.2.1):

a) the need to ensure the availability of the manufacturer's certificate;

b) the need to enter full details of the chain sling in a record of lifting equipment;

c) Availability of instructions for use of the chain sling and information about adequate training of staff.

5.5 Instructions regarding correct use of the chain sling

Instructions regarding the following shall be provided.

a) determination of 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 chain sling to hook of lifting machine;

d) attachment of chain sling to load: direct attachment, choke hitch, basket hitch, special components;

e) protection of chain sling and load;

f) controlling rotation of load;

g) ensuring even balance of the load;

h) correct use of shortening devices;

i) avoidance of shock loading;

j) ensuring safety of personnel;

k) correct fitting of load bearing pins in components according to the series of prEN 1677, if appropriate;

l) correct use of clamping forces;

m) use of less than the full number of legs;

n) preparation of landing site;

o) detachment of chain sling from load;

p) correct storage of chain sling.

5.6 Periodic thorough examination and maintenance

Information shall be given regarding the following:

a) withdrawal criteria;

b) repairs, renewals, re-testing, certification;

c) records of examination and maintenance.

Annex A (informative)

Guidance to assist the manufacturer to prepare documented information for the use and maintenance of chain slings

A.1 Use of chain slings

A.1.1 Chain sling selection

A.1.1.1 General

The relevant Parts of EN 818 and EN 1677 define working load limit using the term General Lifting Service. This reflects the fact that lifting accessories can be and are used in a wide variety of circumstances in terms of configuration, types of load, methods of attachment. Design considerations and working load limit ratings are given in the relevant Parts of EN 818 and EN 1677 take account of these circumstances.

EN 818-4 and EN 818-5 permit an alternative method of rating where a chain sling is to be used exclusively for a single specific lifting application where all of the circumstances of use are known.

A.1.1.2 Use in adverse environments

A.1.1.2.1 High and low temperature conditions

Care should be taken to take account of the maximum temperature which can be reached by the chain sling in service. This is difficult in practice but underestimation of the temperature involved should be avoided. Table A.1 summarizes the necessary variation in WLL due to temperature.

Chain slings of Grades 4 and 8 will not be adversely affected by temperatures down to -40 °C and no reduction from the working load limit is therefore necessary on this account. Where chain slings are to be used at temperatures below -40 °C, the manufacturer should be consulted.

Table A.1: Variation in working load limit due to temperature [1)]

Grade	Working load expressed as a percentage of working load limit				
	Temperature, t, °C				
	$-40 < t \leq 200$	$200 < t \leq 300$	$300 < t \leq 400$	$400 < t \leq 475$	$t \geq 475$
4	100	100	75	50	Not permissible
8	100	90	75	Not permissible	

[1)] The use of chain slings within the permissible temperature ranges given in the table does not require any permanent reduction in working load limit when the chain is returned to normal temperatures. If chain slings reach temperatures in excess of the maximum permissible temperatures indicated in the table, they should be withdrawn from service and referred to the manufacturer.

A.1.1.2.2 Acidic conditions

A.1.1.2.2.1 Chain slings of grade 8

Chain slings of Grade 8 should not be used either immersed in acid solutions or exposed to acid fumes. Attention is drawn to the fact that certain production processes involve acidic solutions and fumes and in these circumstances the manufacturer's advice should be sought.

For the same reasons chain slings should not be galvanized or subjected to any plating processes without the approval of the manufacturer.

A.1.1.2.2.2 Chain slings of grade 4

Chain slings of Grade 4 may be used in acidic conditions. The following precautions should be adopted:

a) the working load of such a chain sling should not be greater than 50 % of the working load limit;

b) the chain sling should be thoroughly washed in clean water immediately after use;

c) the chain sling should be given an inspection by a competent person each day before use.

A.1.1.2.3. Conditions in which the chain sling is likely to be subjected to attack (chemical, abrasive etc.)

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

A.1.1.3 Use in exceptionally hazardous conditions

The rating of lifting accessories in European Standards assumes the absence of exceptionally hazardous conditions. Exceptionally hazardous conditions include 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.1.2 Chain sling verification before first use and in service

A.1.2.1 Before first use

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

a) the chain sling is precisely as ordered;

b) the manufacturer's certificate is to hand;

c) the identification and working load limit marking on the chain sling correspond to the information on the certificate;

d) full details of the chain sling are recorded.

A.1.2.2 Before each use

Before each use the chain sling should be inspected for obvious damage or deterioration (see A.2.1.). If faults are found during this inspection, the procedure given in A.2.1. should be followed.

A.1.3 Handling the load

A.1.3.1 Preparation

Attention should be given to any specific instructions provided for the handling of the load. Before starting the lift, it should be ensured that the load is free to move and is not bolted down or otherwise obstructed.

A.1.3.2 Mass of the load

It is essential that the mass of the load to be lifted is known. If the mass is not marked the information should be obtained from the consignment notes, manuals, plans etc. If such information is not available the mass should be assessed by calculation.

A.1.3.3 Centre of gravity

The position of the centre of gravity of the load should be established in relation to the possible points of attachment of the chain sling. To lift the load without it tilting or toppling the following conditions should be met:

a) For single leg and endless chain slings the attachment point should be vertically above the centre of gravity.

b) For two leg chain slings the attachment points should be either side of and above the centre of gravity.

c) For three and four leg chain 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.1.3.5) and that the attachment points should be above the centre of gravity.

When using two-, three- and four-leg chain slings the attachment points and chain sling configuration should be selected to achieve angles between the chain sling legs and the vertical within the range marked on the chain sling. Preferably all angles to the vertical (angle β in figure A.1) should be equal (but see A.1.3.5). 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 chain slings exert a horizontal component of force (see figure A.1) which increases as the angle between the chain sling legs is increased. Where hooks or other fittings are threaded on a loop of chain, e.g. case chain slings and drum chain slings, the horizontal component of force is much greater and consequently the angle of such legs should not exceed 30° to the vertical . 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.

The hook to which the chain sling is attached should be directly above the centre of gravity.