



# SLOVENSKI STANDARD

## SIST EN 818-2:1999

01-april-1999

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Short link chain for lifting purposes - Safety - Part 2: Medium tolerance chain for chain slings - Grade 8

Short link chain for lifting purposes - Safety - Part 2: Medium tolerance chain for chain slings - Grade 8

Kurzgliedrige Rundstahlketten für Hebezwecke - Sicherheit - Teil 2: Mitteltolerierte Rundstahlketten für Anschlagketten - Güteklasse 8

Chaînes de levage a maillons courts - Sécurité - Partie 2: Chaîne de tolérance moyenne pour élingues en chaînes - Classe 8

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**Ta slovenski standard je istoveten z: EN 818-2:1996**

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### **ICS:**

53.020.30	Pribor za dvigalno opremo	Accessories for lifting equipment
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**SIST EN 818-2:1999**

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English version

**Short link chain for lifting purposes - Safety - Part  
2: Medium tolerance chain for chain slings - Grade  
8**

Chaînes de levage à maillons courts - Sécurité  
- Partie 2: Chaîne de tolérance moyenne pour  
élingues en chaînes - Classe 8

Kurzgliedrige Rundstahlketten für Hebezwecke -  
Sicherheit - Teil 2: Mitteltolerierte  
Rundstahlketten für Anschlagketten - Güteklasse  
8

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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.

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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 168 "Chains, ropes, webbing, slings and accessories - Safety" of which the secretariat 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of an identical text or by endorsement, at the latest by December 1996, and conflicting national standards shall be withdrawn at the latest by December 1996.

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).

The other parts of EN 818 are:

- Part 1: General conditions of acceptance
- Part 3: Medium tolerance chain for chain slings - Grade 4
- Part 4: Chain slings - Grade 8
- Part 5: Chain slings - Grade 4
- Part 6: Chain slings - Instructions for use and maintenance.

A further part or parts will cover fine tolerance chains for chain hoists and other lifting appliances.

This is the first edition of this Part of EN 818.

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

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## 0 Introduction

This European standard has been prepared to be a harmonised standard to provide one means of conforming with the essential safety requirements of the Machinery Directive.

The Directive stipulates that where chain with welded links is used for lifting accessories it is to be of short link type and for the purposes of this standard this is chain having a ratio of nominal pitch to nominal size of 3:1.

The extent to which hazards are covered is indicated in the scope of this Part of EN 818. In addition, lifting equipment shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

Annex C gives a designation system for recording the identifying features of grade 8 short link chain. Since this system is not widely used it has been included in this first edition of this standard as an informative annex, however, should its use become more generally accepted then the status of the information would need to be reviewed.

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## 1 Scope

This Part of EN 818 specifies the requirements related to safety for short link lifting chains, Grade 8, of medium tolerance for use in chain slings and for general lifting purposes. They are electrically welded round steel short link chains, heat treated and tested and complying with the general conditions of acceptance in EN 818-1.

The range of nominal sizes of chain covered by this Part of EN 818 is from 4 mm to 45 mm.

The hazards covered by this Part of EN 818 are identified in clause 4.

The bases for calculation of tabulated values for dimensions, working load limits and mechanical properties are given in annex A.

Annex B gives information on weight/metre of chain.

Annex C gives an example of a designation system for chains.

## 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.

EN 292-1	Safety of machinery - Basic concepts - General principles for design Part 1: Basic terminology methodology
EN 292-2: 1991	Safety of machinery - Basic concepts - General principles for design Part 2: Technical principles and specifications
EN 292-2: 1991 /A1:1995	Safety of machinery - Basic concepts - General principles for design Part 2: Technical principles and specifications
EN 818-1	Short link chain for lifting purposes - Safety Part 1: General conditions of acceptance
prEN 818-6	Short link chain for lifting purposes - Safety Part 6: Chain slings - Instructions for use and maintenance
prEN 1050	Safety of machinery - Risk assessment

### **3 Definitions**

For the purposes of this Part of EN 818 the definitions given in EN 818-1 apply.

### **4 Hazards**

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

In order to provide the necessary strength and durability of lifting accessories this Part of EN 818 lays down requirements for the design, selection of materials of construction and testing to ensure that specified levels of performance are met.

Fatigue failure has not been identified as a hazard when chain having the specified levels of performance given in this Part of EN 818 is used in general lifting service.

Since failure can be caused by the incorrect choice of grade and specification of lifting accessories this Part of EN 818 also gives the requirements for marking and the manufacturers certificate.

Those aspects of safe use associated with good practice are given in prEN 818-6.

Table 1 contains all the hazards, which require action to reduce risk identified by risk assessment as being specific and significant for short link chain (medium tolerance) grade 8 for lifting purposes.

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**Table 1: Hazards and associated requirements**

Hazards identified in annex A of prEN 1050		Relevant clause of annex A of EN 292-2: 1991/A1: 1995	Relevant clause/ sub-clause of this standard
1.1.5	Mechanical hazard due to inadequacy of strength	1.3.2 }	5
		4.1.2.3 }	
		4.1.2.4 }	
		4.2.4	6
		1.7.3 }	7
4.3.1 }			

## 5 Safety requirements

### 5.1 General

The chain shall also comply with the appropriate requirements of EN 818-1.

### 5.2 Dimensions

#### 5.2.1 Nominal size of chain, $d_n$

The nominal size of chain shall be one of the sizes listed in table 2 column 1.

#### 5.2.2 Tolerance on material diameter (except at the weld)

The tolerance on material diameter for each nominal size of chain shall be in accordance with table 2 column 2.

#### 5.2.3 Weld diameter

The maximum diameter at the weld for each nominal size of chain shall be in accordance with table 2 column 3. The thickness of the steel at the weld shall nowhere be less than the actual diameter of the steel adjacent to the weld.

#### 5.2.4 Length dimensionally affected by welding

The length dimensionally affected by welding (e) shall not extend by more than  $0,6 d_n$  to either side of the centre of the link.

#### 5.2.5 Pitch and widths

The dimensions of the pitch and widths of the individual links and chain shall be as specified in table 2 columns 4 to 8, and illustrated in figure 1 of EN 818-1.

**Table 2: Dimensions**

Dimensions in millimetres							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nominal Size  $d_n$	Material diameter tolerance	Weld diameter  $d_s$ max	Pitch			Internal width away from weld  $w_1$ min	External width over the weld  $w_2$ max
			$p_n$	$p$ max	$p$ min		
4	± 0,16	4,4	12	12,4	11,6	5,2	14,8
5	± 0,2	5,5	15	15,5	14,6	6,5	18,5
6	± 0,24	6,6	18	18,5	17,5	7,8	22,2
7	± 0,28	7,7	21	21,6	20,4	9,1	25,9
8	± 0,32	8,8	24	24,7	23,3	10,4	29,6
10	± 0,4	11	30	30,9	29,1	13	37
13	± 0,52	14,3	39	40,2	37,8	16,9	48,1
16	± 0,64	17,6	48	49,4	46,6	20,8	59,2
18	± 0,9	19,8	54	55,6	52,4	23,4	66,6
19	± 1	20,9	57	58,7	55,3	24,7	70,3
20	± 1	22	60	61,8	58,2	26	74
22	± 1,1	24,2	66	68	64	28,6	81,4
23	± 1,2	25,3	69	71,1	66,9	29,9	85,1
25	± 1,3	27,5	75	77,3	72,8	32,5	92,5
26	± 1,3	28,6	78	80,3	75,7	33,8	96,2
28	± 1,4	30,8	84	86,5	81,5	36,4	104
32	± 1,6	35,2	96	98,9	93,1	41,6	118
36	± 1,8	39,6	108	111	105	46,8	133
40	± 2	44	120	124	116	52	148
45	± 2,3	49,5	135	139	131	58,5	167

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### 5.3 Materials and heat treatment

#### 5.3.1 Quality of material

##### 5.3.1.1 General

Within the limitations given in 5.3.1.2 to 5.3.1.4 it is the responsibility of the chain manufacturer to select the type of steel to be used so that the finished chain, when suitably heat-treated meets the mechanical properties specified in this Part of EN 818.

##### 5.3.1.2 Type of steel

The steel used shall be produced by an electric process or by an oxygen blown process.

##### 5.3.1.3 Deoxidation

The steel shall be fully killed, be stabilized against strain age embrittlement and have an austenitic grain size of 5 or finer when tested in accordance with ISO 643.

##### 5.3.1.4 Chemical composition

The steel shall contain alloying elements in sufficient quantities so that the finished chain, when heat treated in accordance with 5.3.2, complies not only with the mechanical properties specified in this Part of EN 818 but also possesses adequate low temperature ductility and toughness to provide resistance to impact loading.

The steel shall contain nickel and at least one of the other elements in the minimum percentages shown in table 3.

**Table 3: Chemical composition-alloying elements**

Element	Minimum mass content % as determined by cast analysis
Nickel	0,40
Chromium	SIST EN 818-2:1999 0,40
Molybdenum	0,15

To ensure that chain is stabilized against strain-age embrittlement during service, the steel shall contain at least 0,025 % aluminium.

The steel shall contain no more sulfur and phosphorus content than the limits given in table 4.