



# SLOVENSKI STANDARD

## SIST EN 10277-3:2000

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### Svetli jekleni izdelki - Tehnični dobavni pogoji - 3. del: Avtomatna jekla

Bright steel products - Technical delivery conditions - Part 3: Free-cutting steels

Blankstahlerzeugnisse - Technische Lieferbedingungen - Teil 3: Automatenstähle

Produits en acier transformés a froid - Conditions techniques de livraison - Partie 3:  
Aciers de décolletage

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Ta slovenski standard je istoveten z: **EN 10277-3:1999**

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#### ICS:

77.140.01	Železni in jekleni izdelki na splošno	Iron and steel products in general
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 10277-3**

July 1999

ICS 77.140.10; 77.140.60

English version

## Bright steel products - Technical delivery conditions - Part 3: Free-cutting steels

Produits en acier transformés à froid - Conditions  
techniques de livraison - Partie 3: Aciers de décolletage

Blankstahlerzeugnisse - Technische Lieferbedingungen -  
Teil 3: Automatenstähle

This European Standard was approved by CEN on 11 June 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.

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

**Central Secretariat: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This European Standard has been prepared by Technical Committee ECISS/TC 23 "Steels for heat treatment, alloy steels and free-cutting steels - Qualities and dimensions", the secretariat of which is held by DIN.

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 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

This European Standard EN 10277 "Bright steel products - Technical delivery conditions" is subdivided as follows:

- Part 1: General;
- part 2: Steels for general engineering purposes;
- part 3: Free-cutting steels;
- part 4: Case hardening steels;
- part 5: Steels for quenching and tempering.

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.

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## 1 Scope

**1.1** This part of EN 10277 applies to bright steel bars in the drawn, turned or ground condition, in straight lengths of free-cutting steels.

**1.2** This EN 10277-3 is complemented by EN 10277-1.

## 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 10087:1998	Free-cutting steels - Technical delivery conditions for semi-finished products, hot-rolled bars and rods
EN 10277-1	Bright steel products - Technical delivery conditions - Part 1: General

## 3 Definitions

See EN 10277-1.

## 4 Classification and designation

### 4.1 Classification

All steels specified in this European Standard are classified as non-alloy quality steels.

### 4.2 Designation

See EN 10277-1.

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## 5 Information to be supplied by the purchaser

See EN 10277-1.

## 6 Manufacturing process

See EN 10277-1.

## 7 Requirements

### 7.1 Chemical composition

#### 7.1.1 Cast analysis

The chemical composition of the steel according to the cast analysis shall be as specified in table 1.

#### 7.1.2 Product analysis

The permissible deviations from the chemical composition as specified in table 1 for cast analysis and the product analysis of the steel shall be as specified in table 2.

### 7.2 Mechanical properties

The mechanical properties shall be as specified

- in table 3 for steels not intended for heat treatment,
- in table 4 for case-hardening steels,
- in table 5 for direct-hardening steels

### 7.3 Supplementary or special requirements

See annex B of EN 10277-1.

## 8 Inspection and testing

See EN 10277-1.

## 9 Marking

See EN 10277-1.

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**Table: 1: Types of steel, chemical composition (applicable to cast analysis)<sup>1)</sup>**

Designation		Steel grade according to	Chemical composition (% by mass)					
Steel name	Steel number		C	Si max.	Mn	P max.	S	Pb
<b>Steels not intended for heat treatment</b>								
11SMn30	1.0715	EN 10087:1998	≤ 0,14	0,05 <sup>2)</sup>	0,90 to 1,30	0,11	0,27 to 0,33	-
11SMnPb30	1.0718	EN 10087:1998	≤ 0,14	0,05	0,90 to 1,30	0,11	0,27 to 0,33	0,20 to 0,35
11SMn37	1.0736	EN 10087:1998	≤ 0,14	0,05 <sup>2)</sup>	1,00 to 1,50	0,11	0,34 to 0,40	-
11SMnPb37	1.0737	EN 10087:1998	≤ 0,14	0,05	1,00 to 1,50	0,11	0,34 to 0,40	0,20 to 0,35
<b>Case-hardening steels</b>								
10S20	1.0721	EN 10087:1998	0,07 to 0,13	0,40	0,70 to 1,10	0,06	0,15 to 0,25	-
10SPb20	1.0722	EN 10087:1998	0,07 to 0,13	0,40	0,70 to 1,10	0,06	0,15 to 0,25	0,20 to 0,35
15SMn13	1.0725	EN 10087:1998	0,12 to 0,18	0,40	0,90 to 1,30	0,06	0,08 to 0,18	-
<b>Direct-hardening steels</b>								
35S20	1.0726	EN 10087:1998	0,32 to 0,39	0,40	0,70 to 1,10	0,06	0,15 to 0,25	-
35SPb20	1.0756	EN 10087:1998	0,32 to 0,39	0,40	0,70 to 1,10	0,06	0,15 to 0,25	0,15 to 0,35
36SMn14	1.0764	EN 10087:1998	0,32 to 0,39	0,40	1,30 to 1,70	0,06	0,10 to 0,18	-
36SMnPb14	1.0765	EN 10087:1998	0,32 to 0,39	0,40	1,30 to 1,70	0,06	0,10 to 0,18	0,15 to 0,35
38SMn28	1.0760	EN 10087:1998	0,35 to 0,40	0,40	1,20 to 1,50	0,06	0,24 to 0,33	-
38SMnPb28	1.0761	EN 10087:1998	0,35 to 0,40	0,40	1,20 to 1,50	0,06	0,24 to 0,33	0,15 to 0,35
44SMn28	1.0762	EN 10087:1998	0,40 to 0,48	0,40	1,30 to 1,70	0,06	0,24 to 0,33	-
44SMnPb28	1.0763	EN 10087:1998	0,40 to 0,48	0,40	1,30 to 1,70	0,06	0,24 to 0,33	0,15 to 0,35
46S20	1.0727	EN 10087:1998	0,42 to 0,50	0,40	0,70 to 1,10	0,06	0,15 to 0,25	-
46SPb20	1.0757	EN 10087:1998	0,42 to 0,50	0,40	0,70 to 1,10	0,06	0,15 to 0,25	0,15 to 0,35
<sup>1)</sup> Elements not quoted in this table shall not be intentionally added to the steel without the agreement of the purchaser, other than for the purpose of finishing the heat. However, elements such as Te, Bi etc., may be added by the manufacturer for improving the machinability, if this has been agreed at the time of enquiry and order.								
<sup>2)</sup> If, by metallurgical techniques, the formation of special oxides is guaranteed, a Si-content of 0,10 to 0,40% can be agreed.								

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**Table 2: Permissible deviations between the product analysis and the limiting values given in table 1 for cast analysis**

Element	Permissible maximum content according to cast analysis % by mass	Permissible deviations <sup>1)</sup> % by mass
C	≤ 0,30 > 0,30 ≤ 0,50	± 0,02 ± 0,03
Si	≤ 0,05 > 0,05 ≤ 0,40	+ 0,01 + 0,03
Mn	≤ 1,00 > 1,00 ≤ 1,70	± 0,04 ± 0,06
P	≤ 0,06 > 0,06 ≤ 0,11	+ 0,008 + 0,02
S	≤ 0,33 > 0,33 ≤ 0,40	± 0,03 ± 0,04
Pb	≤ 0,35	+ 0,03 - 0,02

<sup>1)</sup> ± means that in one cast the deviation may occur over the upper value or under the lower value of the specified range in table 1, but not both at the same time.

**Table 3: Mechanical properties of free-cutting steels not intended for heat treatment**

Designation		Thickness <sup>1)</sup>	Mechanical properties <sup>1)</sup>				
Steel name	Steel number	mm	As rolled + turned (+SH)		Cold drawn (+C)		
			Hardness <sup>2)</sup> HB	R <sub>m</sub> N/mm <sup>2</sup>	R <sub>p0,2</sub> <sup>3)</sup> N/mm <sup>2</sup> min.	R <sub>m</sub> <sup>3)</sup> N/mm <sup>2</sup>	A <sub>5</sub> % min.
11SMn30	1.0715	5 - 10	112 to 169	370 to 570	440	510 to 810	6
11SMnPb30	1.0718	>10 - 16	112 to 169	370 to 570	410	490 to 760	7
11SMn37	1.0736	>16 - 40	112 to 169	370 to 570	375	460 to 710	8
11SMnPb37	1.0737	>40 - 63	112 to 169	370 to 570	305	400 to 650	9
		>63 - 100	107 to 154	360 to 520	245	360 to 630	9

<sup>1)</sup> For thicknesses < 5 mm the mechanical properties may be agreed at the time of enquiry and order.  
<sup>2)</sup> Only for information.  
<sup>3)</sup> For flats the proof strength (R<sub>p0,2</sub>) may deviate by -10% and the tensile strength (R<sub>m</sub>) by ± 10%.