



**SLOVENSKI STANDARD**  
**SIST EN 10277-1:2008**

**01-maj-2008**

**Nadomešča:**  
**SIST EN 10277-1:2000**

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**Svetli jekleni izdelki - Tehnični dobavni pogoji - 1. del: Splošno**

Bright steel products - Technical delivery conditions - Part 1: General

Blankstahlerzeugnisse - Technische Lieferbedingungen - Teil 1: Allgemeines

Produits en acier transformés à froid - Conditions techniques de livraison - Partie 1: Généralités

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**Ta slovenski standard je istoveten z: EN 10277-1:2008**

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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

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English Version

## Bright steel products - Technical delivery conditions - Part 1: General

Produits en acier transformés à froid - Conditions  
techniques de livraison - Partie 1: Généralités

Blankstahlerzeugnisse - Technische Lieferbedingungen -  
Teil 1: Allgemeines

This European Standard was approved by CEN on 4 February 2008.

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## Foreword

This document (EN 10277-1:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 10277-1:1999.

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 the United Kingdom.

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.

During the preparation of the first edition of this European Standard there were not enough statistical data available concerning mechanical properties of bright bar products. Since then it has been recognized that the proof strength values in the cold drawn condition were too high. In addition, cyclic stresses that occur during straightening can reduce the proof strength (Bauschinger's effect), which was not taken into account when drafting the first edition of this standard. In this second edition the proof strength values of non-alloy and alloy grades in condition +QT+C in parts 3 and 5 have been adjusted downwards compared to the first edition.

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**EN 10277-1:2008 (E)****1 Scope**

This part of EN 10277 specifies the general technical delivery conditions for bright steel bars in the drawn, turned or ground condition, in straight lengths and of the following steel types:

- a) steels for general engineering purposes as specified in EN 10277-2;
- b) free-cutting steels as specified in EN 10277-3;
- c) case hardening steels as specified in EN 10277-4;
- d) steels for quenching and tempering as specified in EN 10277-5.

It does not cover cold rolled products and cut lengths produced from strip or sheet by cutting.

In special cases variations in these technical delivery requirements or additions to them may form the subject of an agreement at the time of enquiry and order (see Annex B).

In addition to the specifications of this European Standard, the general technical delivery requirements of EN 10021 are applicable, unless otherwise specified.

**2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 606, *Bar coding - Transport and handling labels for steel products*

<https://standards.iteh.ai/catalog/standards/sist/214ad7b4-f890-4021-b45b-a49661-7b931/sist-en-10277-1-2008>

EN 10002-1, *Metallic materials - Tensile testing - Part 1: Method of test at ambient temperature*

EN 10020:2000, *Definition and classification of grades of steel*

EN 10021, *General technical delivery conditions for steel products*

EN 10027-1, *Designation systems for steels - Part 1: Steel names*

EN 10027-2, *Designation systems for steels - Part 2: Numerical system*

EN 10052, *Vocabulary of heat treatment terms for ferrous products*

EN 10079:2007, *Definition of steel products*

EN 10083-2, *Steels for quenching and tempering – Part 2: Technical delivery conditions for non alloy steels*

EN 10083-3, *Steels for quenching and tempering – Part 3: Technical delivery conditions for alloy steels*

EN 10084, *Case hardening steels – Technical delivery conditions*

EN 10204, *Metallic products - Types of inspection documents*

prCEN/TR 10261, *Iron and steel - Review of available methods of chemical analysis*

EN 10277-2, *Bright steel products - Technical delivery conditions - Part 2: Steels for general engineering purposes*

EN 10277-3, *Bright steel products - Technical delivery conditions - Part 3: Free-cutting steels*

EN 10277-4, *Bright steel products - Technical delivery conditions - Part 4: Case-hardening steels*

EN 10277-5, *Bright steel products - Technical delivery conditions - Part 5: Steels for quenching and tempering*

EN 10278, *Dimensions and tolerances of bright steel products*

EN ISO 377, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997)*

EN ISO 643, *Steels - Micrographic determination of the apparent grain size (ISO 643:2003)*

EN ISO 3887, *Steels - Determination of depth of decarburization (ISO 3887:2003)*

EN ISO 6506-1, *Metallic materials - Brinell hardness test - Part 1: Test method (ISO 6506-1:2005)*

EN ISO 14284, *Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 10021:2006, EN ISO 377:1997, EN ISO 14284:2002 and the following apply.

#### 3.1

**non-alloy and alloy steel; quality and special steel**

see the terms and definitions in EN 10020:2000

#### 3.2

**steel products**

steel products are defined according to their shape and dimensions in EN 10079. In particular the following definitions are reproduced

##### 3.2.1

**drawn products** (3.4.5.1, EN 10079:2007)

products of various cross section shapes obtained, after descaling, by drawing of hot rolled bars or rod on a draw bench (cold deformation without removing material)

NOTE This operation gives the product special features with respect to shape, dimensional accuracy and surface finish. In addition, the process causes cold working of the product, which can be eliminated by subsequent heat treatment. Products in lengths are delivered straightened regardless of size.

##### 3.2.2

**turned products** (3.4.5.2, EN 10079:2007)

round bars produced by turning on a lathe where the product can be further processed by straightening and polishing

NOTE 1 This operation gives the bar special features with respect to shape, dimensional accuracy and surface finish. The removal of metal is carried out in such a way that the bright product is generally free from rolling defects and surface decarburization.

NOTE 2 For technical reasons some bars ordered as hot rolled products may be delivered roughly turned (peeled), nevertheless such products are treated as hot rolled products and not as bright products.

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### 3.2.3

**ground products** (3.4.5.3, EN 10079:2007)

drawn or turned round bars given an improved surface quality and dimensional accuracy by grinding or grinding and polishing

### 3.3

**heat treatment terms**

terms used in the heat treatment of steel are defined in EN 10052

### 3.4

**ruling section for heat treatment**

ruling section for heat treatment of a product is the section for which the mechanical properties have been specified (see Annex A).

Whatever the actual shape and dimensions of the cross section of the product, the size of its ruling section is expressed as a diameter. This corresponds to the diameter of an "equivalent round bar" which, at the position of its cross section specified for taking test pieces for mechanical tests, will, when being cooled from the austenitising temperature, show the same cooling rate as the actual ruling section of the product concerned at its position for taking test pieces

NOTE The term "ruling section" should not be confused with the term "equivalent diameter" as defined in EN 10052.

## 4 Classification and designation

### 4.1 Classification

The classification of the relevant steel grades according to EN 10020 is indicated in EN 10277-2 to EN 10277-5.

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### 4.2 Designation

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#### 4.2.1 Steel names

For the steel grades covered by this European Standard, the steel names as given in the relevant tables of EN 10277-2 to EN 10277-5 are assigned in accordance with EN 10027-1.

#### 4.2.2 Steel numbers

For the steel grades covered by this European Standard, the steel numbers as given in the relevant tables of EN 10277-2 to EN 10277-5 are allocated in accordance with EN 10027-2.

## 5 Information to be supplied by the purchaser

### 5.1 Mandatory information

The following information shall be supplied by the purchaser at the time of enquiry and order:

- a) quantity (mass, number of bars) to be delivered;
- b) shape of the product (e.g. round, hexagon, square, flat);
- c) number of the dimensional standard (EN 10278);
- d) dimensions and tolerances on dimensions;



- e) reference to this European Standard including the number of the part (e.g. EN 10277-3);
- f) steel name or steel number (see 4.2);
- g) delivery condition (see 6.3);
- h) class of surface quality (see 7.7 and Table 1);

## 5.2 Options

The following options may be supplied by the purchaser and as agreed with the manufacturer:

- a) reference testing for products used in the quenched and tempered condition (see B.1);
- b) any fine grain requirement and verification of fine grain size (see 7.4 and B.2);
- c) any requirement for the verification of non-metallic inclusions (see 7.5 and B.3);
- d) depth of decarburization (see 7.6 and B.4);
- e) additional requirements to the tolerances on shape according to EN 10278;
- f) temporary corrosion protection (see B.5);
- g) non-destructive testing (see 7.8 and B.6);
- h) product analysis (see 7.1.2 and B.7);
- i) special marking (see 9 and B.8);
- j) hardenability requirements for grades of EN 10277-4 and EN 10277-5 (see 7.1.1.2 and 7.3 of EN 10277-4 and EN 10277-5);
- k) type of inspection document in accordance with EN 10204 (see 8.1).

### EXAMPLE

2 t round bars with nominal diameter 20 mm, tolerance h9, stock length 6000 mm according to EN 10278 made of steel grade 38SMn28 (1.0760) according to EN 10277-3 in the delivery condition +C, surface quality class 3 and a test report 2.2 as specified in EN 10204.

2t round bars EN 10278 - 20 h9 x stock 6000  
 EN 10277-3-38SMn28+C - class 3  
 EN 10204 – 2.2

or

2t round bars EN 10278 - 20 h9 x stock 6000  
 EN 10277-3-1.0760+C - class 3  
 EN 10204 – 2.2

## 6 Manufacturing process

### 6.1 Steel making process

The steelmaking process shall be at the manufacturer's discretion.

**EN 10277-1:2008 (E)****6.2 Manufacture of the product**

The manufacturing process route of the steel product shall be at the manufacturer's discretion.

**6.3 Delivery conditions****6.3.1 Finished condition**

The steel product shall be delivered in one or a combination of the following finished conditions with or without heat treatment:

- a) drawn, symbol +C;
- b) turned, symbol +SH;
- c) ground, symbol +SL.

**6.3.2 Cast separation**

The products shall be delivered separated by cast.

**7 Requirements****7.1 Chemical composition**

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**7.1.1 Cast analysis**

**7.1.1.1** The chemical composition determined by cast analysis shall be as specified in Table 1 of EN 10277-2 to EN 10277-5. <https://standards.iteh.ai/catalog/standards/sist/214ad7b4-f890-4021-b45b-a49661edb931/sist-en-10277-1-2008>

**7.1.1.2** In cases where steels for case hardening (see EN 10277-4) or for quenching and tempering (see EN 10277-5) are ordered with hardenability requirements, such hardenability requirements shall be considered as the governing criterion for acceptance.

In such cases a deviation of the cast analysis with respect to the values indicated in Table 1 of EN 10277-4 and EN 10277-5 is admissible taking into account footnote b of those tables.

**7.1.2 Product analysis**

The permissible deviations in the product analysis in relation to the specified limits for the cast analysis (see 7.1.1) are specified in Table 2 of EN 10277-2 to EN 10277-5.

The purchaser may specify at the time of enquiry and order that the chemical composition on product analysis shall be verified. In this case reference should be made to B.7.

**7.2 Mechanical properties**

The mechanical properties of products covered by this European Standard shall meet the specifications stated in 7.2 of EN 10277-2 to EN 10277-5.

**7.3 Hardenability**

See 7.3 of EN 10277-4 and EN 10277-5 of this European Standard.

## 7.4 Grain size

Unless otherwise specified by the purchaser at the time of enquiry and order, the grain size of the steel shall be at the discretion of the manufacturer, except for case hardening steels according to EN 10277-4 and for alloy steels for quenching and tempering according to EN 10277-5. Case hardening steels according to EN 10277-4 and alloy steels for quenching and tempering according to EN 10277-5 shall be supplied with fine grain, unless otherwise agreed at the time of enquiry and order.

Where specified by the purchaser at the time of enquiry and order, verification of fine grain size shall be in accordance with B.2.

## 7.5 Non-metallic inclusions

### 7.5.1 Microscopic inclusions

Where specified by the purchaser at the time of enquiry and order, microscopic non-metallic inclusions of case hardening steels and of steels for quenching and tempering (see EN 10277-4 and EN 10277-5) shall be verified in accordance with B.3.1.

### 7.5.2 Macroscopic inclusions

Freedom of macroscopic inclusions cannot be insured in any steel. If agreed at the time of enquiry and order macroscopic inclusions of case hardening steels and of steels for quenching and tempering (see EN 10277-4 and EN 10277-5) shall to be verified in accordance with B.3.2

## 7.6 Decarburization

Where specified by the purchaser at the time of enquiry and order, for steels for quenching and tempering of EN 10277-5, the permissible depth of decarburization and the method of determination shall be in accordance with B.4.

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## 7.7 Surface condition

Drawn products shall have a smooth, scale free surface. Products in the final heat treated condition shall be free from loose surface scale; their surface might be discoloured or darker. For hexagons, squares, flats and profiles with special cross sections one cannot achieve – for manufacturing reasons – the same quality of surface finish as for round cross sections.

Since surface discontinuities (cracks, overlapping, scale, isolated pores, pits, grooves, etc.) can not be completely avoided during manufacturing (hot and cold formation, heat treatments, handling and storage) and since they are retained when drawing, agreements shall be made regarding surface quality. The surface quality of the products shall be one of the classes according to Table 1. Cold drawn products are normally delivered in class 1, while turned and peeled bars as well as ground bars are delivered in class 3. Different classes may be agreed at the time of enquiry and order.

For flats, squares in sizes greater than 20 mm and hexagons in sizes greater than 50 mm, the maximum possible depth of surface discontinuities shall be agreed at the time of enquiry and order.

NOTE Where automatic testing of the surface is applied, 50 mm of each end of the bar is not normally covered.

Surface defects cannot be eliminated without removal of material. Products in the 'technically crack free by manufacture' condition are only available in the turned and peeled and/or ground conditions.