SLOVENSKI STANDARD
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Mere in tolerance svetlih nerjavnih in drugih hladno vlečenih jeklenih izdelkov

Dimensions and tolerances of bright stainless and other cold drawn steel products

Maße und Grenzabmaße von nichtrostenden Blankstahlerzeugnissen und anderen kaltgezogenen Stahlerzeugnissen

Dimensions et tolérances des produits en acier inoxydable et autre produits en acier transformé à froid

Ta slovenski standard je istoveten z: **prEN 10278**

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English Version

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Maße und Grenzabmaße von nichtrostenden Blankstahlerzeugnissen und anderen kaltgezogenen Stahlerzeugnissen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 5.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 10278:2022) has been prepared by Technical Committee CEN/TC 459 "ECISS – European Committee for Iron and Steel Standardization"[1], the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 10278:1999.

In comparison with the previous edition, the following technical modifications have been made:

— bright steels of EN 10277 are excluded from the scope of this document and its application is restricted to stainless steels and special steels which can be delivered as bright products, e.g. tool steels, roller bearing steels, etc.;

— surface condition and tolerance classes revised;

— this document can now also be used for cold heading steels both in form of bars and wire;

— deviation from straightness revised;

— editorially revised.

[1] Through its sub-committee SC 5 “Steels for heat treatment, alloy steels, free-cutting steels and stainless steels” (secretariat: DIN).

1 Scope

This document applies to bright steel products in the drawn, turned or ground condition delivered in straight lengths. This document is mainly applied to stainless steels of EN 10088-3 and other product standards, e.g. tool steels, roller bearing steels. This document can also be used for cold heading steels both in the form of bars and wire.

The non-alloy and alloy steels of EN 10277 are no longer included.

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10079, *Definition of steel products*

EN 10088-3:2014, *Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*

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

EN ISO 9443, *Surface quality classes for hot-rolled bars and wire rod (ISO 9443)*

ISO 286-2, *Geometrical product specifications (GPS) - ISO code system for tolerances on linear sizes - Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

ISO 10474, *Steel and steel products - Inspection documents*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10079 (for drawn products) and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
thickness
nominal dimension of the product

Note 1 to entry: That means:

a) the diameter in the case of rounds;

b) the lateral length in the case of squares;

c) the width over flats in the case of hexagons;

d) the shorter lateral length in the case of flats (rectangular bars) and wide-flats.

For special sections, 'thickness' has to be defined at the time of enquiry and order.

3.2
ovality
difference between the smallest and largest dimension measured across the pairs of opposing points at a common cross-section

3.3
out-of shape
any deviation for the nominal section profile

4 Information to be supplied by the purchaser

4.1 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) reference to this document, i.e. EN 10278;

d) the nominal dimensions and tolerances on dimensions and shape;

e) reference to the material standard including the number of the part (e.g. EN 10088-3);

f) steel name or steel number;

g) the finished condition (see 5.1);

h) the class of surface quality (see EN ISO 9443) where appropriate (not for EN 10088-3).

4.2 Options

Several options are specified in this document and listed below. If the purchaser does not indicate any of these options, the products will be supplied in accordance with the basic specifications (see 4.1).

1. Straightness (see 5.3);
2. Condition of bar ends (see 5.4);
3. Disposition of tolerances (see 5.5);
4. The type of inspection document in accordance with EN 10204 or ISO 10474.

4.3 Examples

EXAMPLE 1
10t rounds EN 10278 – 50 h8 x stock 3000
EN 10088-3-X5CrNi18-10+2P
EN 10204 – 3.1
or
10t rounds EN 10278 – 50 h8 x stock 3000
EN 10088-3-1.4301+2P
EN 10204 – 3.1

EXAMPLE 2
2 t rounds EN 10278 – 20 h9 x stock 6000
EN ISO 4957-32CrMoV12-28 –
EN ISO 9443 - class B
ISO 10474 – 3.1
or
2t rounds EN 10278 – 20 h9 x stock 6000
EN ISO 4957-1.2365+C
EN ISO 9443 – class B
ISO 10474 – 3.1

5 Requirements

5.1 Shape, dimensions and tolerances

The tolerance class on thickness (and width for flats) shall comply with the requirements agreed at the time of enquiry and order and shall be in accordance with Table 1. If there is no agreement on the tolerance class, the bright products are delivered with the standard tolerance class given in Table 1. The tolerance class and the corresponding tolerances are given in Table 2 for rounds, squares and hexagons and in Table 3 for drawn flats. Where specified by the purchaser at the time of enquiry and order, the disposition tolerances specified in Table 2 shall be in accordance with 5.5.

Unless otherwise agreed at the time of enquiry and order, the length and the tolerance on length shall be as specified in Table 4.

The maximum admitted ovality shall be not more than half the specified tolerance range, in any case never above the upper limit of the tolerance. Any other requirements concerning out of shape may be agreed at the time of enquiry and order.

Non-round bars (i.e. square, hexagon and flat) in widths ≤ 150 mm may have an undefined profile within a distance of 0,2 mm of the hypothetical edge, flats in widths > 150 mm within a distance of 0,5 mm, unless otherwise agreed. For widths > 150 mm, sharp corners can be ordered.

5.2 Surface quality

Bright products shall have a smooth, scale free surface. Bright 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.) cannot be completely avoided during manufacturing (hot and cold forming, heat treatments, handling and storage) and since they are retained after drawing, agreements shall be made regarding surface quality. The surface quality of stainless steels shall be according to EN 10088-3:2014, Table 1. The surface quality of other bright steels shall be one of the classes according to EN ISO 9443, where cold drawn products are normally delivered in EN ISO 9443, class B, while turned and peeled bars as well as ground round bars are delivered in EN ISO 9443, class C unless otherwise 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 peeled/turned and/or ground/polished condition.

5.3 Straightness tolerance

Where specified at the time of enquiry and order and in cases of dispute, an agreed number of bars shall be evaluated for straightness in accordance with one of the methods specified in Annex A and the tolerances specified in Tables 5 and 6 shall apply.

5.4 Condition of bar ends

The ends of the product shall be as specified by the purchaser at the time of enquiry and order, e.g. chamfering, facing.

5.5 Disposition of tolerances

The dispositions of tolerances about the nominal dimensions of the product other than specified in 5.1 shall be one of the following as specified by the purchaser at the time of enquiry and order:

a) values all positive, i.e., + and lower tolerances all zero, i.e. -0;

b) values equally disposed about the nominal dimension.

6 Visual and dimensional inspection

A sufficient number of samples shall be inspected for dimensional compliance.

Dimensional inspection shall be carried out as follows:

a) for bars in manufacturing or stock length: not less than 150 mm from the end of the bar;

b) for bars cut to length: not less than 10 mm from the end of the bar.

Table 1 — Surface condition and tolerance class at delivery

	1	2		3	4	5	6	7	8
1	Surface condition at delivery	Symbol		Tolerance class to ISO 286-2[a]					
		Stainless steels	Other steels	Rounds and Wire	Squares	Hexagons	Drawn flats	Special sections	Notes
2	Cold drawn or heat-treated and cold drawn	2H or 2B	+C	h10 (h9 to h12) see Table 2	h11 for d ≤ 80 mm, h12 for 80 mm < d ≤ 100 mm ±0,7 mm for d > 100 mm	h11 for d ≤ 75 mm , h12 for d > 75 mm	h11, h12, see Table 3	–[b]	
3	Cold drawn, heat treated	2D	+C+QT (+C+N) (+C+SR) (+C+A)	h11 see Table 2	–[b]	–[b]	–	–	
4	Peeled/ turned	2H or 2B	+SH	h10 (h9 to h12) see Table 2	–	–	–	–	
5	Ground	2G	+G	h9 (h6 to h12) see Table 2	–	–	–	–	
6	Polished	2P	+PL	h9 (h6 to h12) see Table 2	–	–	–	–	

[a] Standard tolerance classes unless otherwise specified. In brackets: other possible tolerance classes according to ISO 286-2 if required at the time of enquiry and order.

[b] To be agreed at the time of enquiry and order.