

Cold-rolled stainless steel wide strip and plate/sheet — Tolerances on dimensions and shape

The European Standard EN 10259 : 1996 has the status of a British Standard

ICS 77.140.50

National foreword

This British Standard is the English language version of EN 10259 : 1997. It supersedes the requirements for tolerances on dimensions and shape of cold-rolled wide strip and plate/sheet in BS 1449 : Part 2 : 1983 and in BS 1501 : Part 3 : 1990. Both of these British Standards have been amended.

The UK participation in its preparation was entrusted to Technical Committee ISE/30, Stainless steels, which has the responsibility to:

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- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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English version

Cold-rolled stainless steel wide strip and plate/sheet — Tolerances on dimensions and shape

Larges bandes et tôles en acier inoxydable
laminées à froid — Tolérances sur les dimensions
et la forme

Kaltbreitband und Blech aus nichtrostendem
Stahl — Grenzabmaße und Formtoleranzen

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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

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

Foreword

This European Standard has been prepared by Technical Committee ECISS/TC 23 Steels for heat treatment, alloy steels and free-cutting steels — Qualities, 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of an identical text or by endorsement, at the latest by November 1997, and conflicting national standards shall be withdrawn at the latest by November 1997.

It is the first edition of a European Standard for tolerances on dimensions and shape for cold rolled stainless steel wide strip and plate/sheet.

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

This European Standard applies to cold-rolled stainless, heat resisting and creep resisting steel flat products in thicknesses up to 6,5 mm and rolled widths of 600 mm up to 2100 mm, delivered as:

- a) wide strip (coils with a rolled width ≥ 600 mm);
- b) sheet or plate cut from wide strip;
- c) slit cold-rolled wide strip;
- d) cut lengths obtained from slit cold-rolled wide strip or sheet.

It does not apply to cold-rolled stainless, heat resisting and creep resisting steel narrow strip and cut lengths (rolled width < 600 mm, see EN 10258), or to cold-rolled products for which there is a specific standard.

For cold-rolled sheets, manufactured sheet by sheet, the tolerances on thickness, width and length shall be agreed at the time of enquiry and order.

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 publications referred to applies.

EN 10079 *Definition of steel products*

3 Definitions

For the purposes of this European Standard, the definitions given in EN 10079 shall apply.

4 Designation

4.1 Products conforming to this European Standard shall be designated in the following order (see also clause 5):

- a) type of product (wide strip, sheet/plate or cut length);
- b) the number of this European Standard (EN 10259);
- c) nominal thickness in millimetres;
- d) the letter S for products ordered with special tolerances on thickness;
- e) nominal width in millimetres;
- f) the letter S for products ordered with special tolerances on width;
- g) nominal length in millimetres (sheets/plates and cut lengths only);
- h) the letter S for products ordered with special tolerances on length;
- i) the letters FS for strip, sheets/plates or cut lengths ordered with special tolerances on flatness.

4.2 The product designation in accordance with 4.1 shall be followed by the complete designation of the steel ordered (according to EN 10088-2 for example).

Examples of designation are as follows:

Example 1

Wide strip according to this European Standard of nominal thickness 1,2 mm, nominal width of 1500 mm in steel X5CrNi18-10 (1.4301), process route 2B, as specified in EN 10088-2:

Wide strip EN 10259-1,20×1500

Steel EN 10088-2-X5CrNi18-10+2B

or

Wide strip EN 10259-1,20×1500

Steel EN 10088-2-1.4301+2B

Example 2

Sheet according to this European Standard of nominal thickness 0,80 mm ordered with special thickness tolerance (S), nominal width of 1200 mm with special tolerances on width (S), nominal length of 2500 mm with special length tolerance (S) and with special tolerances on flatness (FS) in steel X5CrNi18-10 (1.4301), process route 2B, as specified in EN 10088-2:

Sheet EN 10259-0,80S×1200S×2500S-FS

Steel EN 10088-2-X5CrNi18-10+2B

or

Sheet EN 10259-0,80S×1200S×2500S-FS

Steel EN 10088-2-1.4301+2B

5 Condition of delivery

- 5.1 Flat products according to this European Standard may be delivered as follows:
- a) with normal or special thickness tolerances (see table 1);
 - b) with normal or special width tolerances (see table 2);
 - c) with normal or special length tolerances for sheets/plates or cut lengths (see table 3);
 - d) with normal or special flatness tolerances for strip, sheets/plates or cut lengths (see clause 10).
- 5.2 In the absence of information on the order in respect of the condition of delivery given in 5.1 the flat products shall be delivered with normal tolerances on thickness, width, length and flatness.
- 5.3 The products are delivered, unless otherwise agreed, with slit edges; they may have burrs. If, as a special agreement, mill edge coils are delivered, width tolerance should be agreed between manufacturer and customer.

6 Preferred thicknesses and tolerances on thickness

- 6.1 Preferred thicknesses
- The preferred thicknesses are:
- 0,30 mm; 0,40 mm; 0,50 mm; 0,60 mm; 0,70 mm; 0,80 mm; 1,00 mm; 1,20 mm; 1,50 mm; 2,00 mm; 2,50 mm; 3,00 mm; 4,00 mm; 5,00 mm, 6,00 mm.
- 6.2 Tolerances
- The tolerances on thickness are given in table 1.

7 Tolerances on width

The tolerances on width are given in table 2.

8 Preferred coil inner diameters

The inside diameter of the coil should be decided by mutual agreement. Preferred inside diameters of coils are approximately 500 mm and approximately 600 mm; in the case of slit cold-rolled wide strip, approximately 400 mm may also be available.

9 Tolerances on length

The tolerances on length are given in table 3.

Table 1. Tolerances on nominal thickness							
Dimensions in millimetres							
Nominal thickness		Normal tolerances for a nominal width <i>w</i> of			Special tolerances (S) for a nominal width <i>w</i> of		
equal to and over	less than	<i>w</i> ≤ 1000	1000 < <i>w</i> ≤ 1300	1300 < <i>w</i> ≤ 2100	<i>w</i> ≤ 1000	1000 < <i>w</i> ≤ 1300	1300 < <i>w</i> ≤ 2100
—	0,30	±0,03	—	—	±0,020	—	—
0,30	0,50	±0,04	±0,04	—	±0,025	±0,030	—
0,50	0,60	±0,045	±0,05	—	±0,030	±0,035	—
0,60	0,80	±0,05	±0,05	—	±0,035	±0,040	—
0,80	1,00	±0,055	±0,06	±0,06	±0,040	±0,045	±0,050
1,00	1,20	±0,06	±0,07	±0,07	±0,045	±0,045	±0,050
1,20	1,50	±0,07	±0,08	±0,08	±0,050	±0,055	±0,06
1,50	2,00	±0,08	±0,09	±0,10	±0,055	±0,06	±0,07
2,00	2,50	±0,09	±0,10	±0,11	—	—	—
2,50	3,00	±0,11	±0,12	±0,12	—	—	—
3,00	4,00	±0,13	±0,14	±0,14	—	—	—
4,00	5,00	±0,14	±0,15	±0,15	—	—	—
5,00	6,50 ¹⁾	±0,15	±0,15	±0,16	—	—	—
¹⁾ Including 6,50 mm.							

Table 2. Tolerances on nominal width									
Dimensions in millimetres									
Nominal thickness		Normal tolerances ¹⁾ for a nominal width <i>w</i> of					Special tolerances (S) ¹⁾ for a nominal width <i>w</i> of		
equal to and over	less than	<i>w</i> ≤ 125 ²⁾	125 < <i>w</i> ≤ 250 ²⁾	250 < <i>w</i> ≤ 600 ²⁾	600 < <i>w</i> ≤ 1000 ²⁾	1000 < <i>w</i> ≤ 2100 ²⁾	<i>w</i> ≤ 125	125 < <i>w</i> ≤ 250	250 < <i>w</i> ≤ 600
—	1,00	+ 0,5 0	+ 0,5 0	+ 0,7 0	+ 1,5 0	+ 2,0 0	+ 0,3 0	+ 0,3 0	+ 0,6 0
1,00	1,50	+ 0,7 0	+ 0,7 0	+ 1,0 0	+ 1,5 0	+ 2,0 0	+ 0,4 0	+ 0,5 0	+ 0,7 0
1,50	2,50	+ 1,0 0	+ 1,0 0	+ 1,2 0	+ 2,0 0	+ 2,5 0	+ 0,6 0	+ 0,7 0	+ 0,9 0
2,50	3,50	+ 1,2 0	+ 1,2 0	+ 1,5 0	+ 3,0 0	+ 3,0 0	+ 0,8 0	+ 0,9 0	+ 1,0 0
3,50	6,50 ³⁾	+ 2,0 0	+ 2,0 0	+ 2,0 0	+ 4,0 0	+ 4,0 0	—	—	—
¹⁾ By special agreement, products can be supplied with permissible undersizes on the nominal width. In this case, the values in this table apply as the oversize plus undersize range.									
²⁾ For material with edges re-cut by shearing, the tolerances on width may by agreement be increased to 5 mm									
³⁾ Including 6,50 mm.									

Table 3. Tolerances on nominal length		
Dimensions in millimetres		
Nominal length <i>l</i>	Tolerances	
	Normal	Special (S)
<i>l</i> ≤ 2000	+ 5 0	+ 3 0
2000 < <i>l</i>	+ 0,0025 × <i>l</i> 0	+ 0,0015 × <i>l</i> 0

10 Flatness and edge waviness tolerances

10.1 The flatness tolerance of strip, sheet/plate and cut length shall not exceed 10 mm for normal cases and 7 mm where a special tolerance (FS) is required for length ≤ 3000 mm and 12 mm for normal cases and 8 mm where a special tolerance (FS) is required for length > 3000 mm.

10.2 For strip, the waviness of the edges, i.e., the ratio of wave height (*h*) to wave length (*l*) shall be max. 0,03 for all thicknesses (see figure 1).

10.3 The requirements of 10.1 and 10.2 do not apply to material supplied in the work-hardened condition, for which any requirement must be agreed between manufacturer and customer.

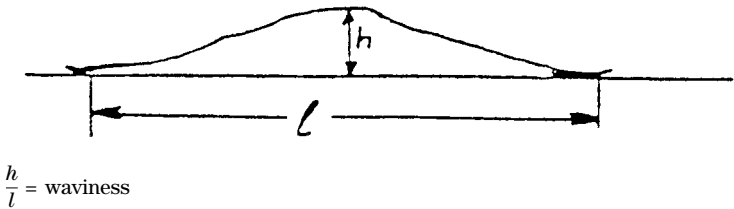


Figure 1 Edge waviness tolerance for strip

11 Tolerances on out-of-squareness

The out-of-squareness of sheets/plates and cut lengths shall not exceed 0,5 % of the width of the product, or alternatively, shall not exceed the values in table 4.

Table 4. Tolerances on out-of-squareness, in terms of the difference between the diagonal lengths of the sheet/plate or cut length	
Dimensions in millimetres	
Sheet/plate/cut lengths	Maximum difference in diagonal lengths
$l \leq 3000$	6
$3000 < l \leq 6000$	10
$l > 6000$	15

12 Tolerances on edge camber

The edge camber tolerances are given in table 5. These tolerances do not apply to material supplied in the work-hardened condition, for which any requirement must be agreed between manufacturer and customer.
NOTE. This requirement can be verified on sheets/plates and cut lengths only. However, products cut from strip should also fulfil this requirement.

Table 5. Tolerances on edge camber			
Dimensions in millimetres			
Specified width		Edge camber tolerances for measuring length	
equal to and over	less than	1000	2000
10	25	4	16
25	40	3	12
40	125	2	8
125	500	1,5	6
500	2100 ¹⁾	1	4
¹⁾ Including 2100 mm width.			

13 Ordered format (for sheet/plate)

When ordering sheet/plate, an agreement may be made that the ordered format must be contained in every piece supplied. In this case, the tolerances on width, length, edge camber and out-of-square shall be agreed at the time of enquiry and order.

14 Measurement

14.1 Thickness

The thickness may be measured at any point located more than 20 mm from the edges.
In the case of slit cold-rolled wide strip and cut lengths having a width of 40 mm or below, the position of measurement shall be at the middle axis.

14.2 Width

Width is measured perpendicularly to the rolling direction of the product.

14.3 Length

The length is measured along the rolling direction of the sheet/plate or cut length.

14.4 Flatness

14.4.1 Flatness tolerances can be measured in the following ways:

- a) Maximum deviation from a flat horizontal surface. With the product lying under its own mass on a flat surface, the maximum deviation from flatness is the maximum distance between the lower surface of the product and the flat horizontal surface.
- b) To measure the flatness, the product shall be laid on an approximately flat surface. Deviation with respect to flatness shall be taken as the greatest distance between the product and a straight edge placed upon it. The straight edge should be either 1000 mm or 2000 mm long. It may be placed on the product at any position and in any direction. Only the position of the points of contact of product and straight edge shall be taken into account..

Unless otherwise agreed, the choice of measurement is left to the manufacturer.

14.4.2 The measurement of waviness is only made on edges.

14.4.3 Flatness and waviness are not normally measured by the manufacturer, unless compliance is in doubt.

14.5 Out-of-squareness

14.5.1 Out-of-square is the greatest deviation of an end edge from a straight edge of a square placed at right angles to a side and touching one corner (see figure 2).

14.5.2 Out-of-squareness may alternatively be measured by the difference between the diagonal lengths.

14.5.3 The out-of-squareness is not normally measured by the manufacturer, unless compliance is in doubt.

14.6 Edge camber

14.6.1 Edge camber is the greatest deviation of a side edge from a straight line, the measurement being taken on the concave side with a straight edge (see figure 3).

14.6.2 Edge camber is not normally measured by the manufacturer, unless compliance is in doubt.

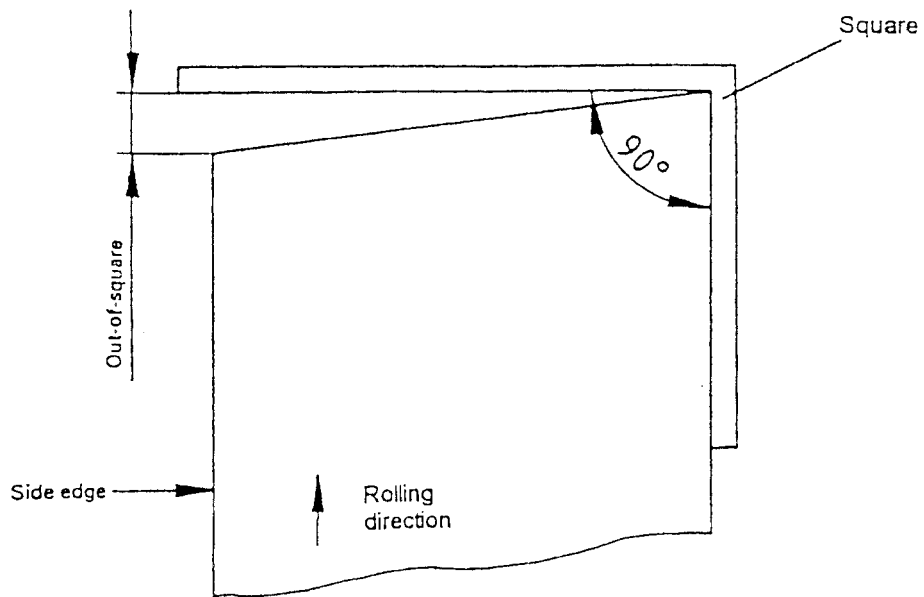


Figure 2. Measurement of out-of-squareness

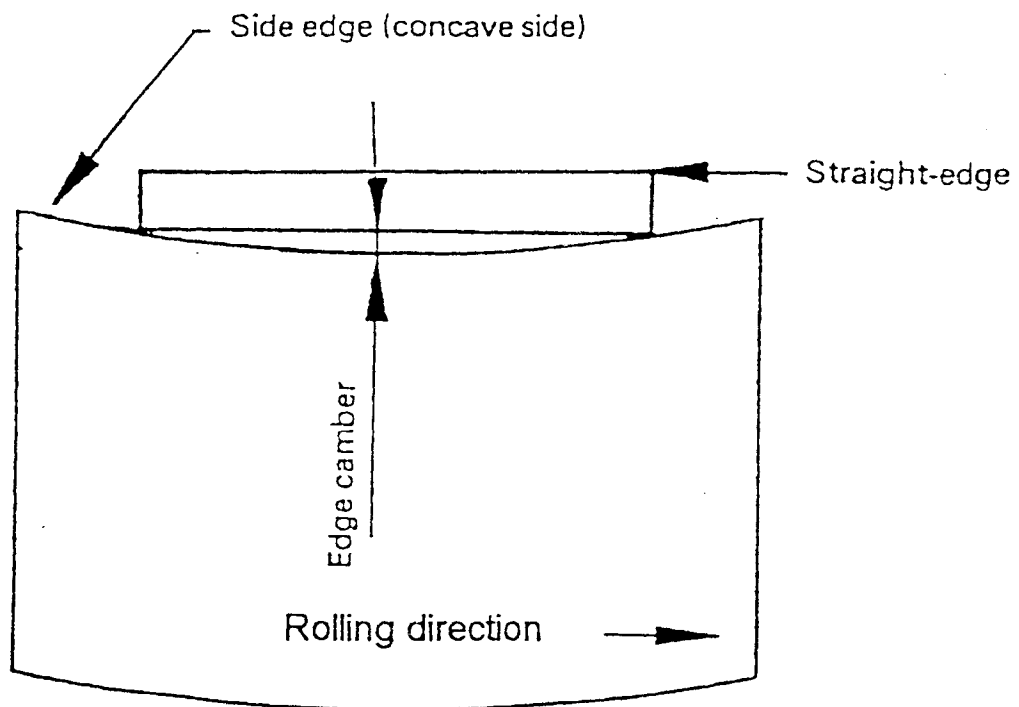


Figure 3. Measurement of edge camber

Annex A (informative)

Bibliography

- | | |
|------------|--|
| EN 10088-2 | <i>Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip for general purposes</i> |
| EN 10258 | <i>Cold-rolled stainless steel narrow strip and cut lengths — Tolerances on dimensions and shape</i> |

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