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<p style="text-align: center;">Flat Steel Products <b>Cold Rolled Wide Strip and Sheet of Stainless Steels</b> Dimensions, Permissible Variations on Dimensions and Form</p>	<p style="text-align: center;"><b>DIN</b> <b>59 382</b></p>
<p>Flachzeug aus Stahl; Kaltgewalztes Breitband und Blech aus nichtrostenden Stählen; Maße, zulässige Maß- und Formabweichungen</p>	
<p style="text-align: center;">Dimensions in mm</p>	
<p><b>1 Scope</b></p> <p><b>1.1</b> This Standard applies to cold rolled flat products <math>\geq 0.40 \leq 6.0</math> mm thick, and in particular to wide strip and sheet cut from such strip in rolling widths <math>&gt; 650 \leq 1600</math> mm and strip prepared from wide strip by longitudinal slitting and sheared strip cut to length from such strip <math>\geq 10 \leq 650</math> mm width in the steels stated in Section 5.</p> <p><b>1.2</b> For cold rolled flat products of stainless steels in rolling widths <math>\leq 650</math> mm, DIN 59 381 applies.</p>	<p><b>3.1.1</b> Where an order is placed without special requirements as to permissible variations on dimensions (i.e. where delivery is required with normal variations), no code letters should be used in the designation.</p> <p><b>3.1.2</b> Instead of the denomination "strip" or "sheet", the abbreviation "Bd" or „Bl" according to DIN 1353 Part 2 may be used.</p> <p><b>3.2</b> Designation of 0.80 mm thick cold rolled strip with normal variations for nominal thickness, 1000 mm wide, of steel X 5 CrNi 18 9 (material number 1.4301) descaled (f), cold worked (K 80), not heat-treated:</p> <p style="padding-left: 40px;">Strip 0.80 x 1000 DIN 59 382 – X 5 CrNi 18 9 f (K 80)</p> <p>or Strip 0.80 x 1000 DIN 59 382 – 1.4301 f (K 80)</p> <p>Designation of 1.20 mm thick cold rolled sheet with close variations (F) for nominal thickness, 1250 mm wide, 3000 mm long, with close variations (F) for length, of steel X 5 CrNiMo 18 10 (material number 1.4401), polished (p):</p> <p style="padding-left: 40px;">Sheet 1.20 F x 1250 x 3000 F DIN 59 382 – X5 CrNiMo 18 10 p</p> <p>or Sheet 1.20 F x 1250 x 3000 F DIN 59 383 – 1.4401 p.</p>
<p><b>2 Definitions</b></p> <p><b>2.1 Flat products</b> See DIN 1623 Part 1.</p> <p><b>2.2 Strip</b> See DIN 1623 Part 1. Strip also includes sheared strip <math>&lt; 600</math> mm width, prepared by shearing strip to length.</p> <p><b>2.3 Sheet</b> See DIN 1623 Part 1.</p> <p><b>2.4 Cold rolled</b> See DIN 1623 Part 1.</p>	
<p><b>3 Designations</b></p> <p><b>3.1</b> For complete designation, the following should be stated in the sequence given:</p> <p>Denomination (strip or sheet),</p> <p>Thickness in mm (if necessary exactly to 2 decimal places),</p> <p>Code letter F where close variation is required for the thickness (see Sections 4.3. a) and 6.1.2),</p> <p>Width in mm,</p> <p>Length in mm (for sheet or sheared strip sheared from strip),</p> <p>Code letter F where close variation is required for the length (see Sections 4.3 b) and 6.4.2),</p> <p>DIN number of the dimension standard,</p> <p>Code number or material number of the steel grade and any identification symbol for the surface condition as given in the quality standards.</p>	<p><b>4 Mode of delivery</b></p> <p><b>4.1</b> Cold rolled flat products according to this Standard can be supplied as</p> <ol style="list-style-type: none"> <li>Wide strip in coils in rolling widths <math>&gt; 650 \leq 1600</math> mm (see Section 6.3),</li> <li>Sheet, cut from strip according to Section 4.1 a),</li> <li>Strip slit longitudinally in coils <math>\geq 10 \leq 650</math> mm wide, manufactured from strip according to Section 4.1 a) and</li> <li>Sheared strip sheared to length from strip according to Section 4.1. c).</li> </ol> <p><b>4.2</b> The products listed in Section 4.1 are supplied with cut edges; they may have a burr.</p>
<p style="text-align: right;">Continued on pages 2 and 3 Explanations on page 4</p>	

Table 1. Preferred nominal thicknesses and permissible variations from thickness

Preferred nominal thicknesses 1)	Permissible variations from thickness 2)				
	at a nominal thickness		Normal variation at nominal widths $\geq 10 \leq 1600$	Close variation (F)	
	$\geq$	$<$		$\geq 10 < 1000$	$\geq 1000 \leq 1600$
0,40	0,40	0,50	$\pm 0,04$	$\pm 0,025$	$\pm 0,03$
0,50; 0,60	0,50	0,70	$\pm 0,05$	$\pm 0,035$	$\pm 0,04$
0,70; 0,80; 0,90; 1,00	0,70	1,10	$\pm 0,06$	$\pm 0,045$	$\pm 0,05$
1,20;	1,10	1,50	$\pm 0,08$	$\pm 0,055$	$\pm 0,06$
1,50; 2,00	1,50	2,50	$\pm 0,10$	$\pm 0,07$	$\pm 0,075$
2,50; 3,00	2,50	3,50	$\pm 0,12$	$\pm 0,085$	$\pm 0,09$
3,50; 4,00	3,50	4,50	$\pm 0,14$	$\pm 0,10$	$\pm 0,11$
4,50; 5,00; 6,00	4,50	6,00 <sup>3)</sup>	$\pm 0,15$	$\pm 0,12$	$\pm 0,13$

1) See Section 6.1.1  
2) See Section 8.1  
3) Including 6.00 mm

4.3 Cold rolled flat products according to Sections 4.1 and 4.2 can also be supplied

- With normal variations or with close variations (F) for thickness (see Section 6.1.2),
- With normal variations or close variations (F) for length for sheet and sheared strip (see Section 6.4.2).

Where delivery with close variation is required, the code letter F should be stated in the designation (see Section 3).

## 5 Material

Cold rolled flat products according to this Standard are manufactured from ferritic, martensitic and austenitic stainless steels, preferably according to DIN 17 440 and Stahl-Eisen-Werkstoffblatt 400 (Steel-Iron-Data Sheet).

The required grade of steel should be stated in the designation.

## 6 Dimensions and permissible dimensional and form variations

### 6.1 Thickness

6.1.1 The preferred nominal thicknesses are given in Table 1. All other thicknesses in the range  $\geq 0,40 \leq 6,0$  mm may however also be supplied.

6.1.2 The permissible thickness variations in the case of normal variations and close variations (F) are given in Table 1 (see also Section 8.1).

### 6.2 Width

6.2.1 The preferred nominal widths are

- For wide strip and sheet cut from such strip: 1000, 1250 and 1500 mm,
- For strip slit longitudinally and sheared strip cut to length from this: 20, 30, 40, 50, 60, 80, 100, 125, 150, 200, 300, 400, 500, 600 and 650 mm.

6.2.2 The values for the permissible oversize on nominal widths are given in Table 2. No undersize on nominal widths is permitted (see Sections 6.2.3 and 6.8).

6.2.3 By special agreement, products can be supplied with permissible undersizes only on the nominal width. In this case also the values in Table 2 apply.

Table 2. Permissible oversize on nominal width

Nominal thickness		Permissible oversize on nominal width 1), at nominal widths			
$\geq$	$<$	$< 100$	$\geq 100 < 300$	$\geq 300 < 750$	$\geq 750 \leq 1600$
0,40	1,00	0,5	0,8	1,0	1,5
1,00	1,75	0,7	1,0	1,5	1,5
1,75	3,00	1,0	1,5	1,5	2,0
3,00	6,00 <sup>2)</sup>	-	-	2,0	2,0

1) See Section 6.2.3  
2) Including 6.00 mm

### 6.3 Diameter of coils

For wide strip, the inside diameter of coils is normally  $\approx 600$  mm; if required, coils can also be supplied with an inside diameter of  $\approx 500$  mm.

### 6.4 Length (in the case of sheet and sheared strip)

6.4.1 Preference shall be given to nominal lengths 2000, 2500 and 3000 mm.

6.4.2 The values given in Table 3 apply for permissible oversizes on nominal lengths in the case of normal and close variations. No undersize on nominal length is permitted (see also Section 6.8).

Table 3. Permissible oversize on nominal length in the case of sheet and sheared strip

Nominal length $l$	Permissible oversize on nominal length	
	Normal variation	Close variation (F)
$\leq 2000$	5	3
$> 2000$	$0,0025 \cdot l$	$0,0015 \cdot l$

### 6.5 Straightness of longitudinal edges

The permissible variation from straightness of the longitudinal edges is 5 mm (see Sections 6.8 and 8.2).

### 6.6 Flatness

6.6.1 For strip, the waviness of the edges, i. e. the ratio of wave height to wave length shall be 3% at the maximum (see Sections 6.6.3 and 8.3).

6.6.2 The permissible variation from flatness with sheet and sheared strip shall be 10 mm (see Sections 6.6.3 and 8.4).

6.6.3 The stipulations in Sections 6.6.1 and 6.6.2 do not apply to work hardened products (type of condition f according to DIN 17 440); for this type of condition, special agreements must be made.

### 6.7 Rectangularity (for sheet and sheared strip)

The variations from rectangularity (see Section 8.5) must not exceed 1% of the width of the product (see also Section 6.8).

### 6.8 Ordered format (for sheet)

When ordering sheet, an agreement may be made that the ordered format must be contained in every piece supplied. In this case, special agreements must be reached concerning the permissible variations from width, length, straightness of the longitudinal edges and rectangularity.

## 7 Weight

The density values given in the quality standards should be used as a basis for determining the theoretical weight of products.

## 8 Testing of dimensional accuracy

8.1 The thickness may be measured at any arbitrarily chosen point on the product at least 20 mm distant from the edges. For widths  $\leq 40$  mm, it shall be measured in the centre of the product width.

8.2 The variation from straightness is taken as the maximum distance between the longitudinal edge and the straight line joining both ends of the measured length. It shall be measured on the concave side of the product.

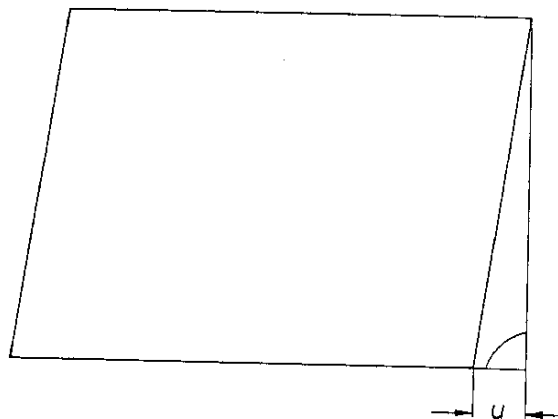
8.2.1 In the case of sheet, the measured length shall be 2500 mm. Testing shall be carried out at a minimum distance of 5000 mm from the beginning or end of the strip.

8.2.2 In the case of sheet and sheared strip  $\leq 2500$  mm long, the measured length shall be the same as the product length. For longer lengths, the measured length shall be 2500 mm.

8.3 For testing the waviness, the wave length shall be taken as the distance between two points at which the product touches a straight edge, and the wave height as the maximum distance between the product and the straight edge.

8.4 The variation from flatness shall be taken as the maximum distance between the product and a flat horizontal surface on which it freely lies.

8.5 The variation from rectangularity  $u$  shall be taken as the vertical projection of a transverse edge on a longitudinal edge (see Figure).



### *Explanations*

This present first issue of a dimension standard for cold rolled flat products of stainless steels covers strip in rolling widths  $> 650$  mm and sheet cut from this. The Standard also serves as a basis for ordering products of smaller width obtained by longitudinal slitting from wide strip and, where applicable, by shearing strip to length. For flat products of stainless steels in rolling widths  $\leq 650$  mm DIN 59 381 applies.

The wording and arrangement of DIN 59 382 has been largely based on the new issue of DIN 1541 now in force for wide strip and sheet of unalloyed steels. In accordance

with normal practice in ordering stainless steels and the manufacturing facilities available however, the scope has been extended on the one hand to cover thicknesses  $\leq 6$  mm and on the other restricted to widths  $\leq 1600$  mm. The values for permissible dimensional variations are in all cases less than those for flat products of unalloyed steels. Attention should be drawn to the information on preferred dimensions for nominal thickness (Table 1), nominal width (Section 6.2.1) and for the length in the case of sheet and sheared strip (Section 6.4.1), which should be taken into account when ordering.