SLOVENSKI STANDARD
SIST EN 485-4:1998

01-april-1998

Aluminij in aluminijeve zlitine - Pločevine, trakovi in plošče - 4. del: Tolerance oblik in odstopki mer hladno valjanih izdelkov

Aluminium and aluminium alloys - Sheet, strip and plate - Part 4: Tolerances on shape and dimensions for cold-rolled products

Aluminium und Aluminiumlegierungen - Bänder, Bleche und Platten - Teil 4: Grenzabmaße und Formtoleranzen für kaltgewalzte Erzeugnisse

Aluminium et alliages d'aluminium - Tôles, bandes et tôles épaisses - Partie 4: Tolérances sur forme et dimensions des produits laminés a froid

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English version

Aluminium and aluminium alloys - Sheet, strip and plate - Part 4: Tolerances on shape and dimensions for cold-rolled products

Aluminium et alliages d'aluminium - Tôles, bandes et tôles épaisses - Partie 4: Tolérances sur forme et dimensions des produits laminés à froid

Aluminium und Aluminiumlegierungen - Bänder, Bleche und Platten - Teil 4: Grenzabmaße und Formtoleranzen für kaltgewalzte Erzeugnisse

This European Standard was approved by CEN on 1993-10-08. 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.

The European Standards exist 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.

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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

Contents list

Foreword

This draft European Standard has been drawn up by CEN/TC 132 "Aluminium and aluminium alloys", whose Secretariat is held by the Association Française de Normalisation (AFNOR).

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 7 "Sheet, strip and plate" to work out the following standard :

EN 485-4 "Aluminium and aluminium alloys - Sheet, strip and plate - Part 4 : Tolerances on dimensions and form for cold-rolled products".

This standard is part of a set of four standards. The other standards deal with :

EN 485-1 "Aluminium and aluminium alloys - Sheet, strip and plate - Part 1 : Technical conditions for inspection and delivery".

EN 485-2 "Aluminium and aluminium alloys - Sheet, strip and plate - Part 2 : Mechanical properties".

EN 485-3 "Aluminium and aluminium alloys - Sheet, strip and plate - Part 3 : Tolerances on dimensions and form for hot-rolled products".

This European Standard was prepared by CEN/TC 132 "Aluminium and aluminium alloys", the secretariat of which is held by AFNOR.

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 April 1994, and conflicting national standards shall be withdrawn at the latest by April 1994.

The Standard was approved and in accordance with the CEN/CENELEC Internal Regulations, the following countires are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

This part of EN 485 specifies the tolerances on shape and dimensions for wrought aluminium and aluminium alloy sheet, strip and plate obtained by cold-rolling, for general engineering applications.

It applies to products with a thickness over 0,20 mm up to and including 50 mm.

It does not apply to semi-finished rolled products in coiled form to be subjected to further rolling (reroll stock) or to special products such as corrugated, embossed, etc. sheet and strip or to special applications such as aerospace, can stock, etc. which are dealt with in separate European Standards.

Technical conditions for inspection and delivery of products covered by this standard are specified in EN 485-1.

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 485-1 Aluminium and aluminium alloys - Sheet, strip and plate - Part 1 : Technical conditions for inspection and delivery.

EN 573-3 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3 : Chemical composition.

3 Dimensional tolerances

3.1 Thickness

3.1.1 For the purpose of this European Standard the alloys are distributed into two groups which correspond to varying difficulty when manufacturing the products. Tighter thickness tolerances apply to Group I alloys (soft alloys).

The grouping is carried out according to the specified chemical composition limits of the alloys (see EN 573-3) as follows :

- Group I alloys :
  - 1000 series alloys ;
  - non heat-treatable 7000 and 8000 series alloys ;
  - 4000 series alloys with less than 2% maximum specified silicon content ;
  - 3000 and 5000 series alloys for which the maximum specified magnesium and manganese contents are each no greater than 1,8% and their sum no greater than 2,3%.
- Group II alloys :
  - all alloys which do not belong to Group I.

The split into Group I and Group II of the most commonly used general engineering alloys is given in

annex A (see table A1).

3.1.2 Thickness tolerances for sheet, strip and plate are specified in table 1

3.1.3 Other thickness tolerances may be agreed between supplier and purchaser. They are specified in annex B.

3.2 Width

3.2.1 Width tolerances for strip are specified in table 2.

3.2.2 Width tolerances for sheet and plate are specified in table 3.

3.3 Length

3.3.1 Length tolerances for strip are not specified.

3.3.2 Length tolerances for sheet and plate are specified in table 4.

4 Shape tolerances

4.1 Lateral curvature

4.1.1 Lateral curvature tolerances for strip with width up to and including 3500 mm are specified in table 5.

The deviation from straightness, *d*, is measured as indicated in figure 1, for a length *L* of 2000 mm, from one end of the strip, while the strip is resting on an horizontal base plate.

4.1.2 Lateral curvature tolerances for sheet and plate are specified in table 6.

The deviation from straightness, *d*, is measured as indicated in figure 1, while the sheet or plate is resting on an horizontal base plate.

4.2 Flatness

4.2.1 Flatness tolerances for strip are not specified.

4.2.2 Flatness tolerances for sheet and plate are specified in table 7 and are expressed as a percentage of the length *L* and /or the width *W* and /or the measured chord length *l*.

Deviation from flatness, *d*, resulting from arching, buckling or edge waves, is measured as shown in figures 2 to 5, using a lightweight straightedge and a feeler gauge, dial gauge or scale, while the sheet or plate is resting on an horizontal base plate concave side upwards.

These tolerances do not apply to sheet and plate supplied in the O(annealed) or F (as fabricated) tempers or to bright sheet.

These tolerances do not include end or corner turnup.

4.3 Squareness

4.3.1 Squareness tolerances for strip are not specified.

4.3.2 Squareness tolerances for sheet and plate are specified in table 8.

The squareness tolerance is expressed as the maximum allowable difference in length of diagonals *AA* and *BB* as shown in figure 6.

Table 1 - Thickness tolerances

Dimensions in millimetres

Specified thickness		Thickness tolerance for specified width															
		Up to and including 1000		Over 1000 up to and including 1250		Over 1250 up to and including 1600		Over 1600 up to and including 2000		Over 2000 up to and including 2500		Over 2500 up to and including 3000		Over 3000 up to and including 3500	
Over	Up to and including	Alloy Group		Alloy Group		Alloy Group		Alloy Group		Alloy Group		Alloy Group		Alloy Group	
		I	II	I	II	I	II	I	II	I and II		I and II		I and II	
0,20	0,4	±0,02	±0,03	±0,04	±0,05	±0,05	±0,06	–	–	–		–		–	
0,4	0,5	±0,03	±0,03	±0,04	±0,05	±0,05	±0,06	±0,06	±0,07	±0,10		–		–	
0,5	0,6	±0,03	±0,04	±0,05	±0,06	±0,06	±0,07	±0,07	±0,08	±0,11		–		–	
0,6	0,8	±0,03	±0,04	±0,06	±0,07	±0,07	±0,08	±0,08	±0,09	±0,12		–		–	
0,8	1,0	±0,04	±0,05	±0,06	±0,08	±0,08	±0,09	±0,09	±0,10	±0,13		–		–	
1,0	1,2	±0,04	±0,05	±0,07	±0,09	±0,09	±0,10	±0,10	±0,12	±0,14		–		–	
1,2	1,5	±0,05	±0,07	±0,09	±0,11	±0,10	±0,12	±0,11	±0,14	±0,16		–		–	
1,5	1,8	±0,06	±0,08	±0,10	±0,12	±0,11	±0,13	±0,12	±0,15	±0,17		–		–	
1,8	2	±0,06	±0,09	±0,11	±0,13	±0,12	±0,14	±0,14	±0,16	±0,19		–		–	
2	2,5	±0,07	±0,10	±0,12	±0,14	±0,13	±0,15	±0,15	±0,17	±0,20		–		–	
2,5	3,0	±0,08	±0,11	±0,13	±0,15	±0,15	±0,17	±0,17	±0,19	±0,23		–		–	
3,0	3,5	±0,10	±0,12	±0,15	±0,17	±0,17	±0,19	±0,18	±0,20	±0,24		–		–	
3,5	4,0	±0,15		±0,20		±0,22		±0,23		±0,25		±0,34		±0,38	
4,0	5,0	±0,18		±0,22		±0,24		±0,25		±0,29		±0,36		±0,42	
5,0	6,0	±0,20		±0,24		±0,25		±0,26		±0,32		±0,40		±0,46	
6,0	8,0	±0,24		±0,30		±0,31		±0,32		±0,38		±0,44		±0,50	
8,0	10	±0,27		±0,33		±0,36		±0,38		±0,44		±0,50		±0,56	
10	12	±0,32		±0,38		±0,40		±0,41		±0,47		±0,53		±0,59	
12	15	±0,36		±0,42		±0,43		±0,45		±0,51		±0,57		±0,63	
15	20	±0,38		±0,44		±0,46		±0,48		±0,54		±0,60		±0,66	
20	25	±0,40		±0,46		±0,48		±0,50		±0,56		±0,62		±0,68	
25	30	±0,45		±0,50		±0,53		±0,55		±0,60		±0,65		±0,70	
30	40	±0,50		±0,55		±0,58		±0,60		±0,65		±0,70		±0,75	
40	50	±0,55		±0,60		±0,63		±0,65		±0,70		±0,75		±0,80	

When measuring the thickness, a zone 10 mm wide from the edges of the product shall be disregarded

Table 2 - Width tolerances for strip

Dimensions in millimetres

Specified thickness		Width tolerance for specified width					
Over	Up to and including	Up to and including 100	Over 100 up to and including 300	Over 300 up to and including 500	Over 500 up to and including 1250	Over 1250 up to and including 1650	Over 1650 up to and including 2600
0,20	0,6	+0,3 0	+0,4 0	+0,6 0	+1,5 0	+2,5 0	+3 0
0,6	1,0	+0,3 0	+0,5 0	+1 0	+1,5 0	+2,5 0	+3 0
1,0	2,0	+0,4 0	+0,7 0	+1,2 0	+2 0	+2,5 0	+3 0
2,0	3,0	+1 0	+1 0	+1,5 0	+2 0	+2,5 0	+4 0
3,0	5,0	-	+1,5 0	+2 0	+3 0	+3 0	+5 0

Table 3 - Width tolerances for sheet and plate

Dimensions in millimetres

Specified thickness		Width tolerance for specified width				
Over	Up to and including	Up to and including 500	Over 500 up to and including 1250	Over 1250 up to and including 2000	Over 2000 up to and including 3000	Over 3000 up to and including 3500
0,20	3,0	+1,5 0	+3 0	+4 0	+5 0	-
3,0	6,0	+3 0	+4 0	+5 0	+8 0	+8 0
6,0	50	+4 0	+5 0	+5 0	+8 0	+8 0

Table 4 - Length tolerances for sheet and plate

Dimensions in millimetres

Specified thickness		Length tolerance for specified length				
Over	Up to and including	Up to and including 1000	Over 1000 up to and including 2000	Over 2000 up to and including 3000	Over 3000 up to and including 5000	Over 5000
0,20	3,0	+3 0	+4 0	+6 0	+8 0	+0,2 % of specified length
3,0	6,0	+4 0	+6 0	+8 0	+10 0	
6,0	50	+6 0	+8 0	+10 0	+10 0	