

BS EN 755-9:2016



BSI Standards Publication

# Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles

Part 9: Profiles, tolerances on dimensions and form

**National foreword**

This British Standard is the UK implementation of EN 755-9:2016. It supersedes BS EN 755-9:2008 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee NFE/35, Light metals and their alloys.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Date	Text affected
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## Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 9: Profiles, tolerances on dimensions and form

Aluminium et alliages d'aluminium - Barres, tubes et profilés filés - Partie 9 : Profilés, tolérances sur dimensions et forme

Aluminium und Aluminiumlegierungen - Stranggepresste Stangen, Rohre und Profile - Teil 9: Profile, Grenzabmaße und Formtoleranzen

This European Standard was approved by CEN on 11 April 2016.

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## European foreword

This document (EN 755-9:2016) has been prepared by Technical Committee 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of an identical text or by endorsement, at the latest by December 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

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 755-9:2008.

The following technical modifications have been introduced during the revision:

- Subclause 4.2, Straightness;
- Subclause 4.3, Convexity-Concavity;
- Table 10;
- Subclause 4.4 Contour;
- Table 11;
- Subclause 4.5, Twist.

EN 755 comprises the following parts under the general title *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles*:

- *Part 1: Technical conditions for inspection and delivery;*
- *Part 2: Mechanical properties;*
- *Part 3: Round bars, tolerances on dimensions and form;*
- *Part 4: Square bars, tolerances on dimensions and form;*
- *Part 5: Rectangular bars, tolerances on dimensions and form;*
- *Part 6: Hexagonal bars, tolerances on dimensions and form;*
- *Part 7: Seamless tubes, tolerances on dimensions and form;*
- *Part 8: Porthole tubes, tolerances on dimensions and form;*
- *Part 9: Profiles, tolerances on dimensions and form.*

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia,

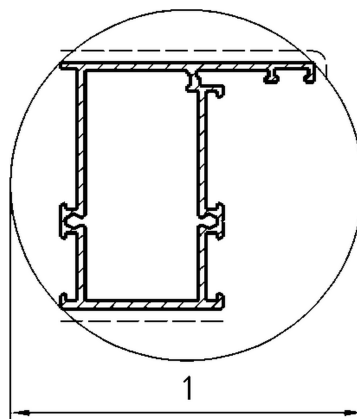
France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 1 Scope

This European Standard specifies the tolerances on dimensions and form for aluminium and aluminium alloy extruded profile with a cross section contained within a circumscribing circle not greater than 800 mm (see Figure 1).

The temper designations used in this part are according to EN 515.

This European Standard applies to extruded profiles for general engineering applications only.



### Key

1 circumscribing circle  $CD \leq 800$  mm

Figure 1 — Circumscribing circle

## 2 Alloy groups

For the purpose of this document, the alloys are distributed into two groups which correspond to varying degrees of difficulty when manufacturing the products.

The division into group I and group II of the most commonly used general engineering alloys is specified in Table 1. Grouping of other alloys is subject to agreement between supplier and purchaser.

Table 1 — Alloy groups

Group I	EN AW-1050A, EN AW-1070A, EN AW-1200, EN AW-1350 EN AW-3102, EN AW-3003, EN AW-3103 EN AW-5005, EN AW-5005A EN AW-6101A, EN AW-6101B, EN AW-6005, EN AW-6005A, EN AW-6106, EN AW-6008, EN AW-6010A, EN AW-6023, EN AW-6060, EN AW-6360, EN AW-6063, EN AW-6063A, EN AW-6463
Group II	EN AW-2007, EN AW-2011, EN AW-2011A, EN AW-2014, EN AW-2014A, EN AW-2017A, EN AW-2024, EN AW-2030 EN AW-5019, EN AW-5049, EN AW-5051A, EN AW-5251, EN AW-5052, EN AW-5154A, EN AW-5454, EN AW-5754, EN AW-5083, EN AW-5086 EN AW-6012, EN AW-6014, EN AW-6018, EN AW-6351, EN AW-6061, EN AW-6261, EN AW-6262, EN AW-6262A, EN AW-6065, EN AW-6081, EN AW-6082, EN AW-6182 EN AW-7003, EN AW-7005, EN AW-7108, EN AW-7108A, EN AW-7020, EN AW-7021, EN AW-7022, EN AW-7049A, EN AW-7075

### 3 Tolerances on dimensions

#### 3.1 Cross-sectional dimensions

##### 3.1.1 General

The tolerances on the dimensions listed below (see Figures 2, 3 and 4) are specified in the relevant Tables 2 to 9.

- *A*: wall thicknesses except those enclosing the hollow spaces in hollow profiles;
- *B*: wall thicknesses enclosing the hollow spaces in hollow profiles except those between two hollow spaces;
- *C*: wall thicknesses between two hollow spaces in hollow profiles;
- *E*: the length of the shorter leg of profiles with open ends;
- *H*: all dimensions (except wall thickness) between points on the cross section of the profile or the centres of open screw holes. Between points on the outer contour to points inside a hollow chamber so long as they are not identical to wall thickness *B*. Alternatively from the inside of a hollow chamber to the inside of another hollow chamber so long as they are not identical to wall thickness *C* and are not within the definition of dimension *H*. Such dimensions shall be replaced by dimension *H* plus wall thickness *B* or *C* or shall be subject to agreement between supplier and purchaser.

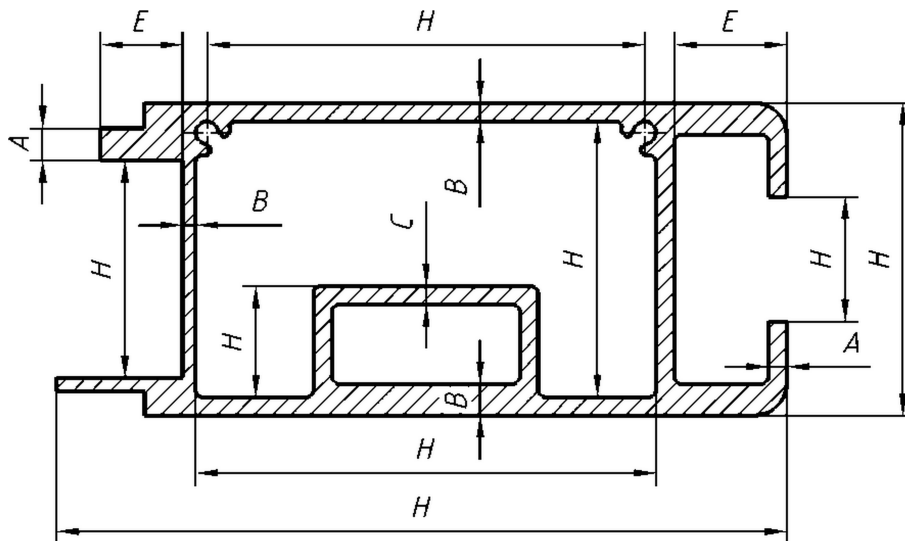


Figure 2 — Definition of dimensions *A*, *B*, *C*, *E*, *H*

##### 3.1.2 Tolerances on dimensions other than wall thickness

The tolerances on dimensions shall be as specified in Tables 2 and 3. For profiles with open ends (see Figures 3, 4 and the relevant examples) the tolerances specified in Table 4 shall be added to those of Tables 2 and 3 for dimension *H* across open ended legs in order to obtain the tolerances on the gap between any opposite points on these ends.



**Table 2 — Tolerances on cross-sectional dimensions of solid and hollow profiles - Alloy group I**

Dimensions in millimetres

Dimension $H$		Tolerances on $H$ for circumscribing circle $CD$ <sup>a, b</sup>				
Over	Up to and including	$CD \leq 100$	$100 < CD \leq 200$	$200 < CD \leq 300$	$300 < CD \leq 500$	$500 < CD \leq 800$
-	10	±0,25	±0,30	±0,35	±0,40	±0,50
10	25	±0,30	±0,40	±0,50	±0,60	±0,70
25	50	±0,50	±0,60	±0,80	±0,90	±1,0
50	100	±0,70	±0,90	±1,1	±1,3	±1,5
100	150	-	±1,1	±1,3	±1,5	±1,7
150	200	-	±1,3	±1,5	±1,8	±2,0
200	300	-	-	±1,7	±2,1	±2,4
300	450	-	-	-	±2,8	±3,0
450	600	-	-	-	±3,8	±4,2
600	800	-	-	-	-	±5,0

<sup>a</sup> These tolerances do not apply to tempers O and Tx510. For these tempers, the tolerances shall be subject to agreement between supplier and purchaser.

<sup>b</sup> For profiles with open ends, see Figures 3 and 4, the tolerances for  $H$  in the area of the open ends shall be increased by the values specified in Table 4.

**Table 3 — Tolerances on cross-sectional dimensions of solid and hollow profiles - Alloy group II**

Dimensions in millimetres

Dimension $H$		Tolerances on $H$ for circumscribing circle $CD$ <sup>a, b</sup>				
Over	Up to and including	$CD \leq 100$	$100 < CD \leq 200$	$200 < CD \leq 300$	$300 < CD \leq 500$	$500 < CD \leq 800$
-	10	±0,40	±0,50	±0,55	±0,60	±0,70
10	25	±0,50	±0,70	±0,80	±0,90	±1,1
25	50	±0,80	±0,90	±1,0	±1,2	±1,3
50	100	±1,0	±1,2	±1,3	±1,6	±1,8
100	150	-	±1,5	±1,7	±1,8	±2,0
150	200	-	±1,9	±2,2	±2,4	±2,7
200	300	-	-	±2,5	±2,8	±3,1
300	450	-	-	-	±3,5	±3,8
450	600	-	-	-	±4,5	±5,0
600	800	-	-	-	-	±6,0

<sup>a</sup> These tolerances do not apply to tempers O and Tx510. For these tempers, the tolerances shall be subject to agreement between supplier and purchaser.

<sup>b</sup> For profiles with open ends, see Figures 3 and 4, the tolerances for  $H$  in the area of the open ends shall be increased by the values specified in Table 4.

**Table 4 — Additions to the tolerances on cross-sectional dimensions  $H$  of solid and hollow profiles with open ends - Alloy groups I and II**

Dimensions in millimetres

Dimension $E$		Additions to the tolerances on $H$ in Tables 2 and 3 for dimensions across the ends of open ended profiles
Over	Up to and including	
-	20	-
20	30	$\pm 0,15$
30	40	$\pm 0,25$
40	60	$\pm 0,40$
60	80	$\pm 0,50$
80	100	$\pm 0,60$
100	125	$\pm 0,80$
125	150	$\pm 1,0$
150	180	$\pm 1,2$
180	210	$\pm 1,4$
210	250	$\pm 1,6$
250	-	$\pm 1,8$

Figures 3 and 4 below show open ends on hollow and solid profiles. The determination of tolerances on cross-sectional dimensions  $H$  is shown in the following calculation examples 1 and 2.

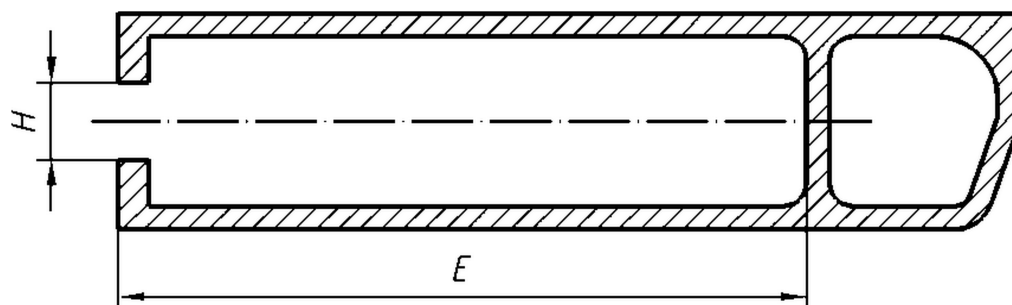
Examples of tolerance calculations across open ended profiles.

**EXAMPLE 1**

Dimension  $H$ : 20 mm

Dimension  $E$ : 100 mm Circumscribing circle  $CD$  100 mm to 200 mm Alloy Group I

The tolerance on  $H$  according to Table 2 is  $\pm 0,40$  mm; plus the additional tolerance according to Table 4 which is  $\pm 0,60$  mm; total tolerance on  $H$  is  $\pm 1,0$  mm.



**Figure 3 — Hollow profile with open end**

EXAMPLE 2

Dimension  $H$ : 40 mm

Dimension  $E$ : 50 mm Circumscribing circle  $CD$  100 mm to 200 mm Alloy group II

The tolerance on  $H$  according to Table 3 is  $\pm 0,90$  mm; plus the additional tolerance according to Table 4 which is  $\pm 0,40$  mm; total tolerance on  $H$  is  $\pm 1,3$  mm.

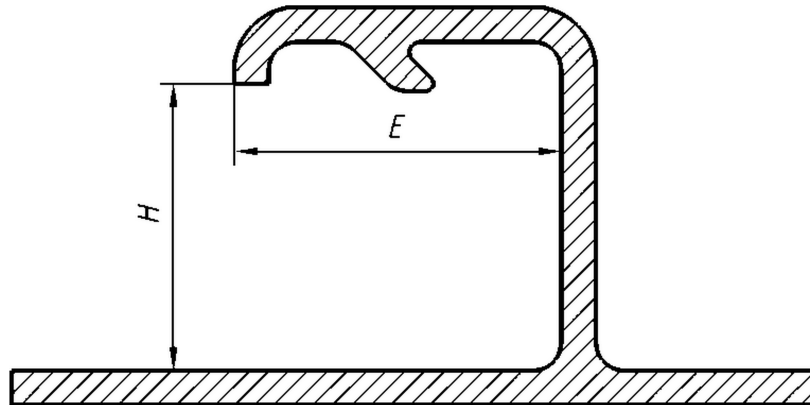


Figure 4 — Solid profile with open end

### 3.1.3 Tolerances on wall thickness of solid and hollow profiles

The tolerances on wall thickness of solid and hollow profiles shall be as specified in Tables 5, 6, 7 and 8.

**Table 5 — Tolerances on wall thickness for profiles with a circumscribing circle up to and including 300 mm - Alloy group I**

Dimensions in millimetres

Nominal wall thickness $A, B$ or $C$		Tolerances on wall thickness					
		Wall thickness $A$ Circumscribing circle		Wall thickness $B^a$ Circumscribing circle		Wall thickness $C$ Circumscribing circle	
Over	Up to and including	$CD \leq 100$	$100 < CD \leq 300$	$CD \leq 100$	$100 < CD \leq 300$	$CD \leq 100$	$100 < CD \leq 300$
-	1,5	$\pm 0,15$	$\pm 0,20$	$\pm 0,20$	$\pm 0,30$	$\pm 0,25$	$\pm 0,35$
1,5	3	$\pm 0,15$	$\pm 0,25$	$\pm 0,25$	$\pm 0,40$	$\pm 0,30$	$\pm 0,50$
3	6	$\pm 0,20$	$\pm 0,30$	$\pm 0,40$	$\pm 0,60$	$\pm 0,50$	$\pm 0,75$
6	10	$\pm 0,25$	$\pm 0,35$	$\pm 0,60$	$\pm 0,80$	$\pm 0,75$	$\pm 1,0$
10	15	$\pm 0,30$	$\pm 0,40$	$\pm 0,80$	$\pm 1,0$	$\pm 1,0$	$\pm 1,2$
15	20	$\pm 0,35$	$\pm 0,45$	$\pm 1,2$	$\pm 1,5$	$\pm 1,5$	$\pm 1,9$
20	30	$\pm 0,40$	$\pm 0,50$	$\pm 1,5$	$\pm 1,8$	$\pm 1,9$	$\pm 2,2$
30	40	$\pm 0,45$	$\pm 0,60$	-	$\pm 2,0$	-	$\pm 2,5$
40	50	-	$\pm 0,70$	-	-	-	-

<sup>a</sup> For seamless hollow profiles the tolerances given for wall thickness  $C$  shall apply.

**Table 6 — Tolerances on wall thickness for profiles with a circumscribing circle over 300 mm - Alloy group I**

Dimensions in millimetres

Nominal wall thickness <i>A, B or C</i>		Tolerances on wall thickness					
		Wall thickness <i>A</i> Circumscribing circle		Wall thickness <i>B</i> <sup>a</sup> Circumscribing circle		Wall thickness <i>C</i> Circumscribing circle	
Over	Up to and including	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800
-	1,5	±0,25	-	-	-	-	-
1,5	3	±0,35	±0,40	±0,60	±0,80	±0,75	±1,0
3	6	±0,40	±0,50	±0,80	±1,0	±1,0	±1,2
6	10	±0,45	±0,55	±1,0	±1,2	±1,2	±1,5
10	15	±0,50	±0,60	±1,2	±1,5	±1,5	±1,9
15	20	±0,55	±0,65	±1,7	±2,0	±2,0	±2,5
20	30	±0,60	±0,70	±2,0	±2,5	±2,5	±3,0
30	40	±0,70	±0,80	±2,2	±2,7	±2,7	±3,3
40	50	±0,80	±0,90	-	-	-	-

<sup>a</sup> For seamless hollow profiles the tolerances given for wall thickness *C* shall apply.

**Table 7 — Tolerances on wall thickness for profiles with a circumscribing circle up to and including 300 mm - Alloy group II**

Dimensions in millimetres

Nominal wall thickness <i>A, B or C</i>		Tolerances on wall thickness					
		Wall thickness <i>A</i> Circumscribing circle		Wall thickness <i>B</i> <sup>a</sup> Circumscribing circle		Wall thickness <i>C</i> Circumscribing circle	
Over	Up to and including	<i>CD</i> ≤ 100	100 < <i>CD</i> ≤ 300	<i>CD</i> ≤ 100	100 < <i>CD</i> ≤ 300	<i>CD</i> ≤ 100	100 < <i>CD</i> ≤ 300
-	1,5	±0,20	±0,25	±0,30	±0,40	±0,35	±0,50
1,5	3	±0,25	±0,30	±0,35	±0,50	±0,45	±0,65
3	6	±0,30	±0,35	±0,55	±0,70	±0,60	±0,90
6	10	±0,35	±0,45	±0,75	±1,0	±1,0	±1,3
10	15	±0,40	±0,50	±1,0	±1,3	±1,3	±1,7
15	20	±0,45	±0,55	±1,5	±1,8	±1,9	±2,2
20	30	±0,50	±0,60	±1,8	±2,2	±2,2	±2,7
30	40	±0,60	±0,70	-	±2,5	-	-
40	50	-	±0,80	-	-	-	-

<sup>a</sup> For seamless hollow profiles the tolerances given for wall thickness *C* shall apply.

**Table 8 — Tolerances on wall thickness for profiles with a circumscribing circle over 300 mm – Alloy group II**

Dimensions in millimetres

Nominal wall thickness <i>A, B or C</i>		Tolerances on wall thickness					
		Wall thickness <i>A</i> Circumscribing circle		Wall thickness <i>B</i> <sup>a</sup> Circumscribing circle		Wall thickness <i>C</i> Circumscribing circle	
Over	Up to and including	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800	300 < <i>CD</i> ≤ 500	500 < <i>CD</i> ≤ 800
-	1,5	±0,35	-	-	-	-	-
1,5	3	±0,45	±0,50	±0,70	±0,90	±0,90	±1,2
3	6	±0,60	±0,60	±0,90	±1,0	±1,2	±1,3
6	10	±0,65	±0,70	±1,2	±1,5	±1,5	±1,9
10	15	±0,70	±0,80	±1,5	±1,8	±1,9	±2,3
15	20	±0,75	±0,85	±2,0	±2,5	±2,3	±3,1
20	30	±0,80	±0,90	±2,5	±3,0	±3,1	±3,7
30	40	±0,90	±1,0	±3,0	±3,2	-	-
40	50	±1,0	±1,1	-	-	-	-

<sup>a</sup> For seamless hollow profiles the tolerances given for wall thickness *C* shall apply.

### 3.2 Length

If fixed lengths are to be supplied, this shall be stated in the order document. The tolerances on fixed length shall be as specified in Table 9.

**Table 9 — Tolerances on fixed length**

Dimensions in millimetres

Circumscribing circle diameter <i>CD</i>		Tolerances on fixed length <i>L</i>				
Over	Up to and including	<i>L</i> ≤ 2 000	2 000 < <i>L</i> ≤ 5 000	5 000 < <i>L</i> ≤ 10 000	10 000 < <i>L</i> ≤ 15 000	15 000 < <i>L</i> ≤ 25 000
-	100	+5 0	+7 0	+10 0	+16 0	+22 0
100	200	+7 0	+9 0	+12 0	+18 0	+24 0
200	450	+8 0	+11 0	+14 0	+20 0	+28 0
450	800	+9 0	+14 0	+16 0	+22 0	+30 0

If no fixed length is specified in the order document, profiles may be delivered in random lengths.

The length range and the tolerances on the random length shall be subject to agreement between supplier and purchaser.

### 3.3 Squareness of cut ends

The squareness of cut ends shall be within half of the fixed length tolerance range specified in Table 9 for both fixed and random length (e.g. for a fixed length tolerance of  $^{+10}_0$  mm, the squareness of cut ends shall be within 5 mm).

## 4 Tolerances on form

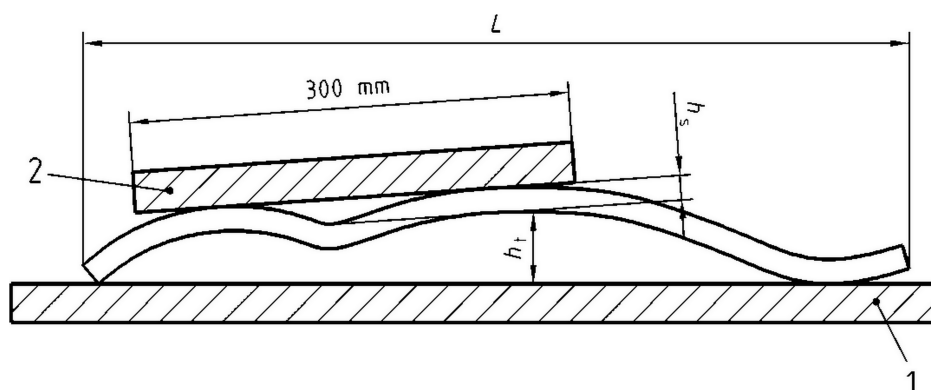
### 4.1 General

Tolerances on form for O and Tx510 tempers shall be subject to agreement between supplier and purchaser.

### 4.2 Straightness

Deviations from straightness,  $h_s$  and  $h_t$ , shall be measured as shown in Figure 5 with the profile placed on a horizontal base plate so that its own mass decreases the deviation.

The straightness tolerance  $h_t$  shall not exceed  $1,5 \text{ mm/m} \times L$  where  $L$  is the length of the profile (e.g. Nine mm maximum deviation for a 6 m length  $L$ ). Local deviations  $h_s$  from straightness shall not exceed  $0,6 \text{ mm}/300 \text{ mm}$  length.



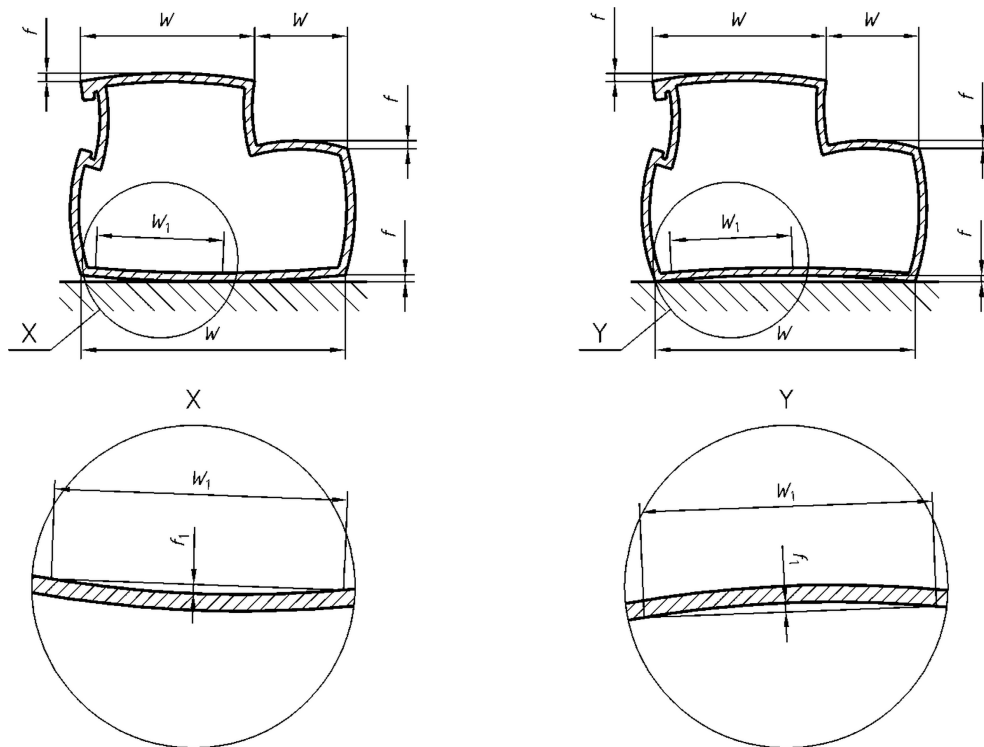
#### Key

- 1 base plate
- 2 straight edge

Figure 5 — Measurement of deviation from straightness

### 4.3 Convexity-Concavity

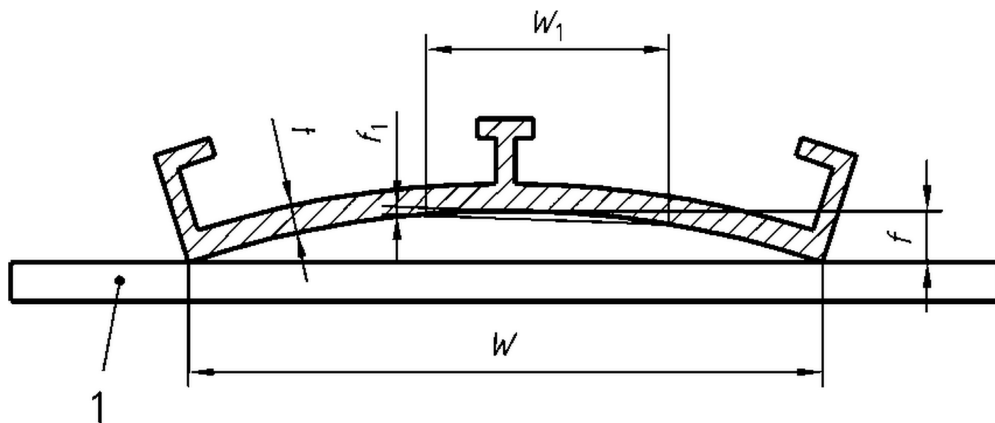
The convexity-concavity shall be measured as shown in Figures 6 and 7. For Alloy Group I the maximum allowable deviation on convexity-concavity for solid and hollow profiles shall be as specified in Table 10 as a function of profile width  $W$  and thickness  $t$ . For alloys in Alloy Group II, the tolerances given in Table 10 shall be multiplied by a factor of 1,4.



**Key**

- $W$  width
- $f$  deviation
- $W_1$  100 mm
- $f_1$  local deviation per any 100 mm

**Figure 6 — Measurement of convexity - concavity for hollow sections**



**Key**

- 1 base plate
- $W$  width
- $f$  deviation
- $W_1$  100 mm
- $f_1$  local deviation per any 100 mm

**Figure 7 — Measurement of convexity - concavity for open section**

**Table 10 — Convexity - concavity tolerances**

Dimensions in millimetres

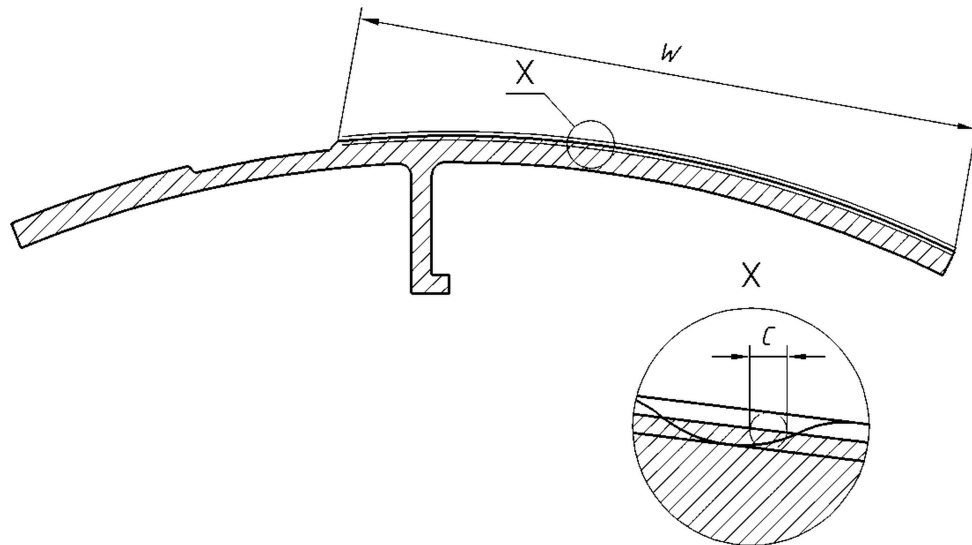
Width $W$		Deviation $f$		
		Hollow profiles <sup>a</sup>		Solid profiles
Over	Up to and including	Wall thickness $t \leq 5$	Wall thickness $t > 5$	
-	30	0,30	0,20	0,20
30	60	0,40	0,30	0,30
60	100	0,60	0,40	0,40
100	150	0,90	0,60	0,60
150	200	1,2	0,80	0,80
200	300	1,8	1,2	1,2
300	400	2,4	1,6	1,6
400	500	3,0	2,0	2,0
500	600	3,6	2,4	2,4
600	800	4,0	3,0	3,0
For alloys in Group II, the specified tolerances shall be multiplied by a factor of 1,4.				
<sup>a</sup> If the profile has varying wall thicknesses in the measurement range, the thinnest wall thickness shall be used.				

In the case of solid and hollow profiles with a width  $W$  of at least 150 mm, the local deviation  $f_1$ , shall not exceed 0,7 mm for any 100 mm of width  $W_1$ .

#### 4.4 Contour

For profiles in Alloy Group I with curved cross sections, the deviation at any point of the curve from the theoretically exact line as defined by the drawing shall not be greater than the appropriate tolerance  $C$  specified in Table 11. Considering all points on the curve, a tolerance zone shall be defined as the zone between two envelopes running tangentially to all circles of diameter  $C$  which can be drawn with their centres lying along the theoretically exact line; this is shown in Figure 8.





For alloys in Alloy Group II the specified tolerances shall be multiplied by a factor of 1,4.

**Figure 8 — Definition of contour tolerances**

**Table 11 — Contour tolerances for alloys in Alloy Group I**

Dimensions in millimetres

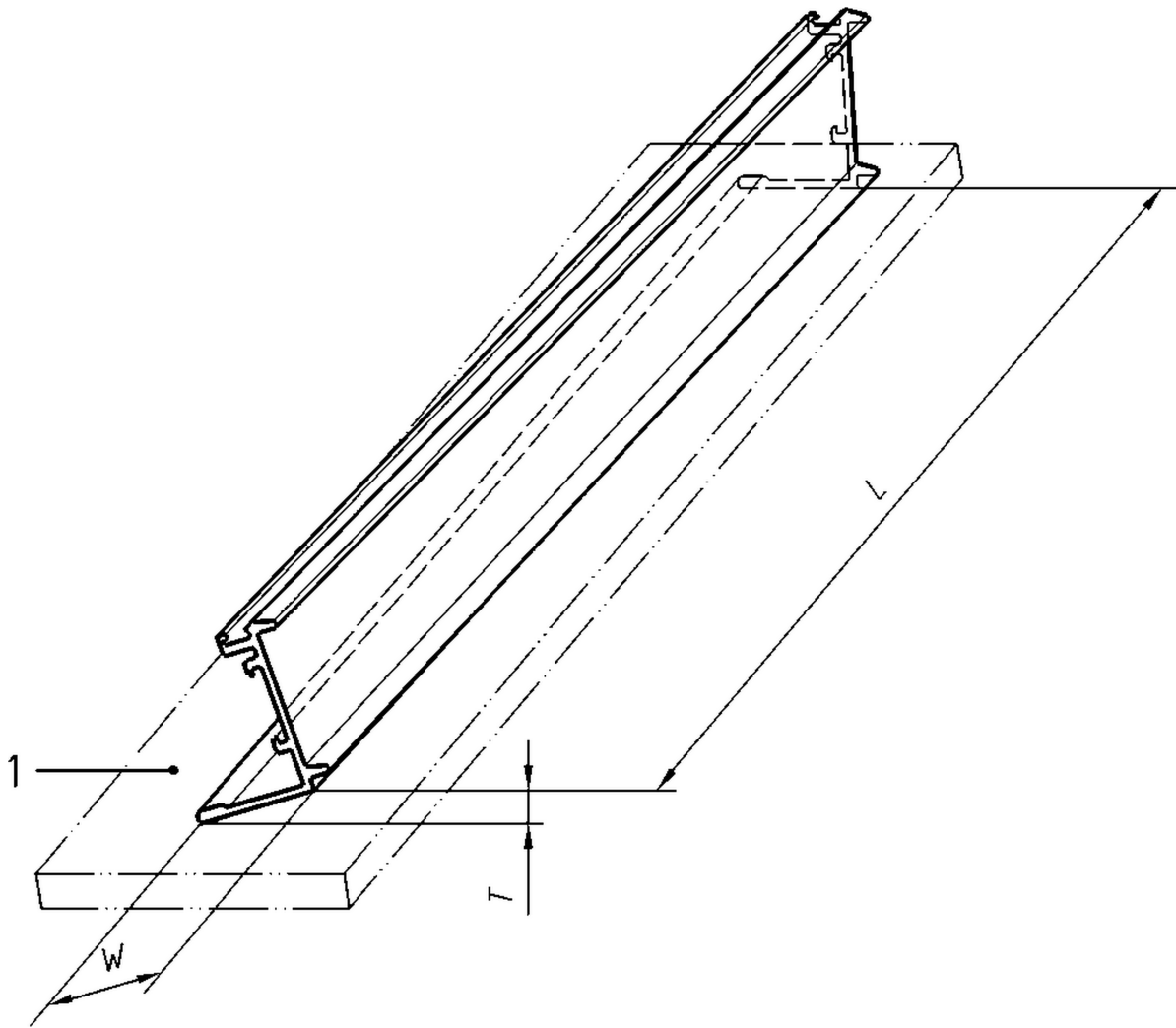
Width $W$ of the contour		Contour tolerance = diameter $C$ of the tolerance circle
Over	Up to and including	
-	30	0,30
30	60	0,50
60	90	0,70
90	120	1,0
120	150	1,2
150	200	1,5
200	250	2,0
250	300	2,5
300	400	3,0
400	500	3,5
500	800	4,0

NOTE Contour tolerances can be checked by the use of suitable gauges (min./max.).

#### 4.5 Twist

Twist  $T$  shall be measured as shown in Figure 9 by placing the profile on a flat baseplate, the profile resting under its own mass. As shown in Figure 9, twist is determined by measuring the maximum distance between the bottom surface of the profile and the surface of the base plate.

Twist tolerances are specified in Table 12 as a function of the width  $W$  and the length  $L$  of the profile.



**Key**

1 base plate

**Figure 9 — Measurement of twist**

Figure 9 shows an example of a simple case of twist. There are other possibilities where the twist shall be identified differently. Some examples are given below:

- Differing positioning of the profile on the baseplate such that the maximum twist shall be calculated as the sum of two separate measurements on the diagonal end positions.
- Discontinuous twist over the profile length such that the maximum twist is the difference between specific points along the length. The maximum twist in this case is not necessarily equal to the maximum distance to the base plate and should not be confused with planarity of the surfaces (combination of twist and straightness).
- In the case of such difficult interpretation of twist, the specific requirements and methods of measurement shall be subject to agreement between supplier and purchaser.

**Table 12 — Twist tolerances**

Dimensions in millimetres

Width $W$		Twist tolerance $T$ for length $L$		
Over	Up to and including	Per 1 000 of length <sup>a</sup>	On total profile length $L$	
			Over 1 000 and including 6 000	Over 6 000
-	30	1,2	2,5	3,0
30	50	1,5	3,0	4,0
50	100	2,0	3,5	5,0
100	200	2,5	5,0	7,0
200	300	2,5	6,0	8,0
300	450	3,0	8,0	1,5 x $L$ ( $L$ in metres)
450	600	3,5	9,5	
600	800	4,5	10,0	

<sup>a</sup> Twist tolerances for lengths less than 1 000 mm shall be subject to agreement between supplier and purchaser.

#### 4.6 Angularity

The deviation from a specified angle shall be measured as shown in Figures 10 and 11.

The angularity tolerances for right angles shall be as specified in Table 13 as a function of profile width  $W$ .

The maximum allowable deviation  $\alpha$  in an angle other than a right angle shall be  $\pm 1^\circ$ .

In the case of unequal side lengths the tolerance on angularity shall apply to the shorter side of the angle, i.e. it is measured starting from the longer side.

**Table 13 — Angularity tolerances for right angles**

Dimensions in millimetres

Width $W$		Maximum allowable deviation, $Z$ from a right angle
Over	Up to and including	
-	30	0,4
30	50	0,7
50	80	1,0
80	120	1,4
120	180	2,0
180	240	2,6
240	300	3,1
300	400	3,5

For profiles with  $W$  which exceeds 400 mm, the tolerances shall be subject to agreement between the supplier and purchaser.

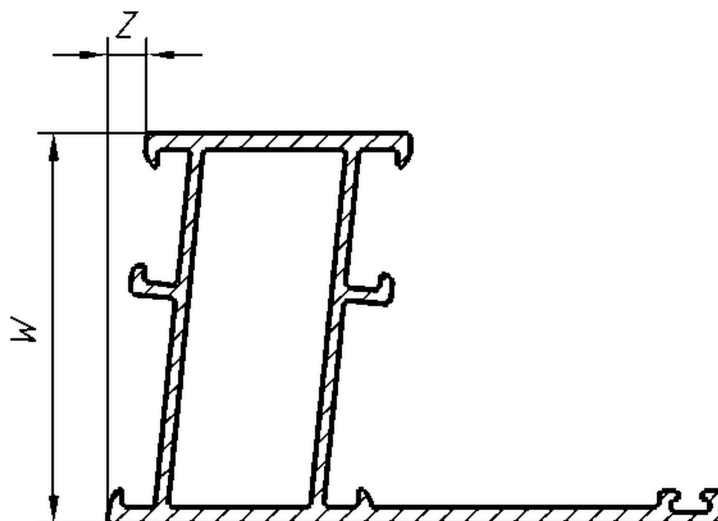


Figure 10 — Measurement of angularity in a right angle

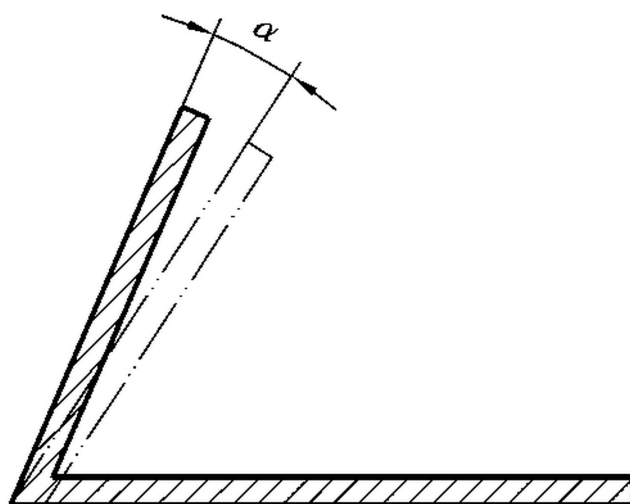


Figure 11 — Measurement of angularity in an angle other than a right angle

#### 4.7 Corner and fillet radii

Sharp corners and fillets may be slightly rounded unless otherwise indicated on the drawing. The maximum allowable corner and fillet radii shall be as specified in Table 14.

When a corner or fillet radius is specified, the maximum allowable deviation from this radius shall be as specified in Table 15.

**Table 14 — Maximum allowable corner and fillet radii**

Dimensions in millimetres

Wall thickness <i>A, B or C</i> <sup>a</sup>	Maximum allowable radius	
	Alloy group I	Alloy group II <sup>b</sup>
≤ 5	0,6	0,8
> 5	1,0	1,5

<sup>a</sup> Where varying wall thicknesses are involved, the maximum allowable radius in the transition zone is a function of the greater wall thickness.

<sup>b</sup> These tolerances only apply to 6xxx series alloys in group II. The maximum allowable radii for the other alloys in group II shall be subject to agreement between supplier and purchaser.

**Table 15 — Maximum allowable deviation from specified corner and fillet radii**

Specified radius mm	Maximum allowable deviation from specified radius
≤ 5	±0,5 mm
> 5	±10 %

## Bibliography

- [1] EN 515, *Aluminium and aluminium alloys — Wrought products — Temper designations*



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