



**SLOVENSKI STANDARD**  
**kSIST FprEN 12020-2:2015**  
**01-november-2015**

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**Aluminij in aluminijeve zlitine - Precizni iztiskani profili v zlitinah EN AW-6060 in EN AW-6063 - 2. del: Tolerance mer in oblike**

Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form

Aluminium und Aluminiumlegierungen - Stranggepresste Präzisionsprofile aus Legierungen EN AW-6060 und EN AW-6063 - Teil 2: Grenzabmaße und Formtoleranzen

Aluminium et alliages d'aluminium - Profilés de précision filés en alliages EN AW-6060 et EN AW-6063 - Partie 2 : Tolérances sur dimensions et forme

**Ta slovenski standard je istoveten z: FprEN 12020-2**

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**ICS:**

77.150.10      Alumijski izdelki      Aluminium products

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**FINAL DRAFT**  
**FprEN 12020-2**

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ICS 77.150.10

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English Version

## Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form

Aluminium et alliages d'aluminium - Profilés de précision filés en alliages EN AW-6060 et EN AW-6063 - Partie 2 : Tolérances sur dimensions et forme

Aluminium und Aluminiumlegierungen - Stranggepresste Präzisionsprofile aus Legierungen EN AW-6060 und EN AW-6063 - Teil 2: Grenzabmaße und Formtoleranzen

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 132.

If this draft becomes a European Standard, 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.

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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  
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## European foreword

This document (FprEN 12020-2:2015) has been prepared by Technical Committee CEN/TC 132 “Aluminium and aluminium alloys”, the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12020-2:2008.

The following technical modifications have been introduced during the revision:

- subclause 4.1, Plane Parallelism;
- subclause 4.2, Straightness;
- subclause 4.5, Twist.

EN 12020 comprises the following parts under the general title "*Aluminium and aluminium alloys — Extruded precision profiles in alloys EN AW-6060 and EN AW-6063*”:

- *Part 1: Technical conditions for inspection and delivery*
- *Part 2: Tolerances on dimensions and form*

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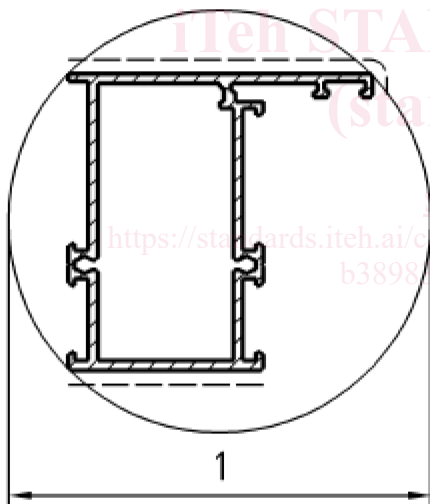
## 1 Scope

This European Standard specifies tolerances on dimensions and form of extruded precision profiles, in alloys EN AW-6060 and EN AW-6063 manufactured with and without a thermal barrier (see Figures 1 and 2). It applies to extruded products supplied without further surface treatment. Precision profiles covered in this standard are distinguished from extruded profiles for general applications covered in EN 755-9 by the following characteristics:

- they are mainly for architectural applications;
- they meet more stringent requirements regarding the surface condition of visible surfaces;
- the maximum diameter of the circumscribing circle  $CD$  is 350 mm;
- they are made to closer tolerances on dimensions and form.

In the case of profiles which, due to the complexity of their design, are difficult to manufacture and specify, then special agreements between supplier and purchaser may need to be reached.

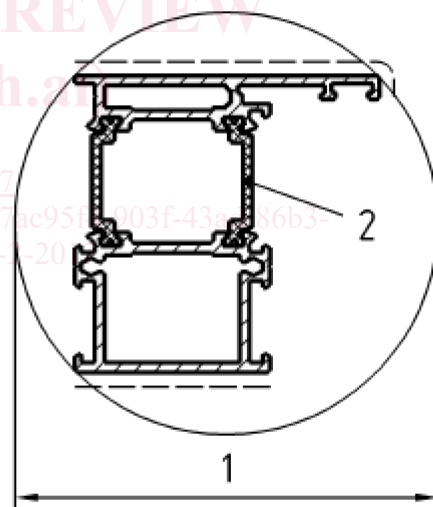
NOTE The effect of the thermal barrier material on the dimensional tolerances is covered by this document although the actual thermal barrier material itself is not (see EN 14024).



### Key

1  $CD$  maximum 350 mm

Figure 1 — Profile without thermal barrier



### Key

1  $CD$  maximum 350 mm  
2 thermal barriers

Figure 2 — Profile containing thermal barrier

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 1101, *Geometrical product specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out (ISO 1101)*

## 3 Tolerances on dimensions

### 3.1 General

If, for compelling reasons, tolerances closer than those specified in 3.2.1 and 3.2.2 are required, these shall only be specified for dimensions that are critical to the function, subject to specific agreement between supplier and purchaser. Any such reduction shall not exceed two-thirds of the values specified in this standard and is subject to a minimum tolerance band of 0,3 mm.

### 3.2 Cross-sectional dimensions

#### 3.2.1 General

The tolerances of the following dimensions (see Figure 3) are specified in Tables 1 and 2.

- *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, including open ends.

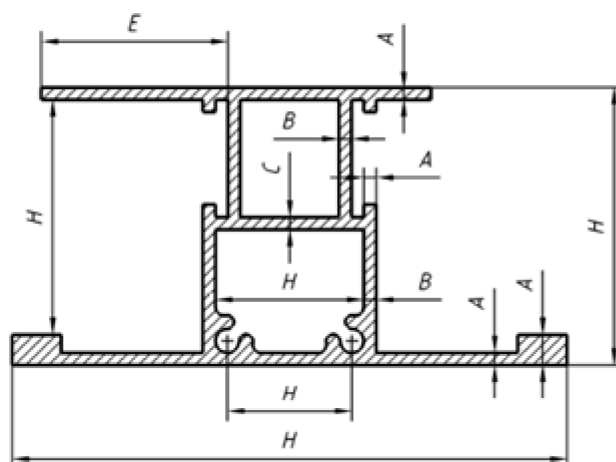


Figure 3 — Definition of dimensions *A*, *B*, *C*, *E*, *H*

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## 3.2.2 Tolerances on dimensions other than wall thickness

The tolerances for dimension  $H$  shall be as specified in Table 1.

**Table 1 — Tolerances on cross-sectional dimensions**

Dimensions in millimetres

Dimension $H$		Tolerances on $H$ (except open ends)	Tolerances on $H$ (open ends)	
Over	Up to and including		$E \leq 60$	$60 < E \leq 120^a$
-	10	$\pm 0,15$	$\pm 0,15$	b
10	15	$\pm 0,20$	$\pm 0,20$	b
15	30	$\pm 0,25$	$\pm 0,25$	b
30	45	$\pm 0,30$	$\pm 0,30$	$\pm 0,45$
45	60	$\pm 0,40$	$\pm 0,40$	$\pm 0,55$
60	90	$\pm 0,45$	$\pm 0,45$	$\pm 0,65$
90	120	$\pm 0,60$	$\pm 0,60$	$\pm 0,80$
120	150	$\pm 0,80$	$\pm 0,80$	$\pm 1,0$
150	180	$\pm 1,0$	$\pm 1,0$	$\pm 1,3$
180	240	$\pm 1,2$	$\pm 1,2$	$\pm 1,5$
240	300	$\pm 1,5$	$\pm 1,5$	$\pm 1,8$
300	350	$\pm 1,8$	$\pm 1,8$	$\pm 2,1$

NOTE Tolerances given in Table 1 do not cover dimensions from a given point inside a closed hollow chamber to any other point outside the chamber.

<sup>a</sup> Tolerances for values of dimension  $E$  over 120 mm shall be subject to agreement between supplier and purchaser.

<sup>b</sup> Shall be subject to agreement between purchaser and supplier.

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

The tolerances on wall thickness (see Figure 3) of solid and hollow profiles shall be as specified in Table 2.



**Table 2 — Tolerances on wall thickness of solid and hollow profiles**

Dimensions in millimetres

Nominal wall thickness <i>A</i> , <i>B</i> or <i>C</i>		Tolerances on:			
		Wall thickness <i>A</i>		Wall thickness <i>B</i> and <i>C</i>	
Over	Up to and including	Circumscribing circle $CD \leq 100$	Circumscribing circle $100 < CD \leq 350$	Circumscribing circle $CD \leq 100$	Circumscribing circle $100 < CD \leq 350$
-	2	± 0,15	± 0,20	± 0,20	± 0,30
2	3	± 0,15	± 0,25	± 0,25	± 0,40
3	6	± 0,20	± 0,30	± 0,40	± 0,60
6	10	± 0,25	± 0,35	± 0,60	± 0,80
10	15	± 0,30	± 0,40	± 0,80	± 1,0
15	20	± 0,35	± 0,45	± 1,2	± 1,5
20	30	± 0,40	± 0,50	a	a
30	40	± 0,45	± 0,60	a	a

<sup>a</sup> Shall be subject to agreement between supplier and purchaser.

When, for functional reasons, tolerances are specified for both the outside and inside dimensions of hollow sections, then the deviations given in Table 2 shall not apply as a wall thickness tolerance, but as a tolerance on the difference in wall thickness. This difference shall be determined by measuring the maximum and minimum wall thickness in the same plane.

### 3.3 Length

If fixed lengths are to be supplied, this shall be stated on the order. The fixed length tolerances shall be as specified in Table 3.

**Table 3 — Tolerances on fixed length**

Dimensions in millimetres

Circumscribing circle <i>CD</i>		Tolerances on fixed length <i>L</i>			
Over	Up to and including	$L \leq 2\ 000$	$2\ 000 < L \leq 5\ 000$	$5\ 000 < L \leq 10\ 000$	$L > 10\ 000$
-	100	+5 0	+7 0	+10 0	Subject to agreement between supplier and purchaser
100	200	+7 0	+9 0	+12 0	
200	350	+8 0	+11 0	+14 0	

If no fixed or minimum length is specified in the order, profiles may be delivered in random lengths. The length range and the tolerances on the random lengths shall be subject to agreement between supplier and purchaser.

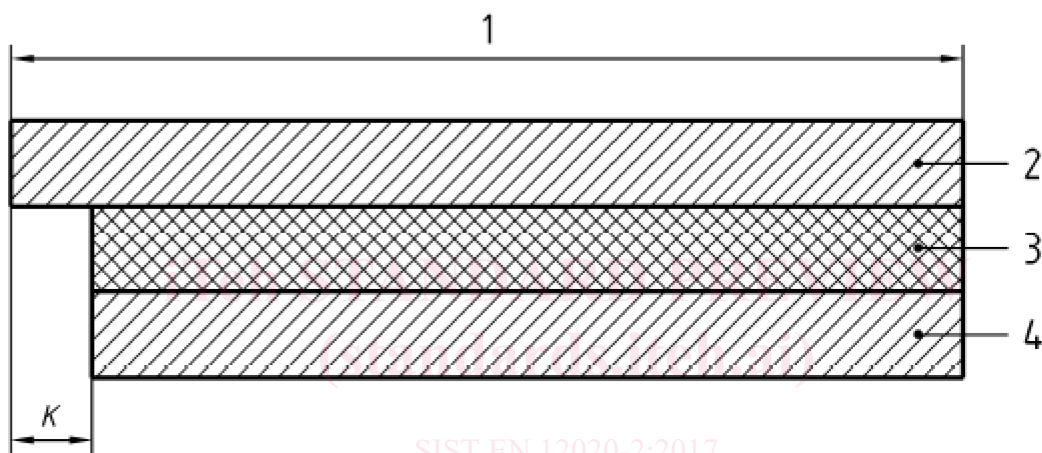
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### 3.4 Squareness of cut ends

The squareness of cut ends shall be within half of the fixed length tolerance range specified in Table 3 for both fixed and random lengths, e.g. for a fixed length tolerance of  $+_{0}^{10}$  mm the deviation from squareness of cut ends shall be within 5 mm measured over all the complete cross sectional width of the profile.

### 3.5 Length offset for profiles with a thermal barrier

Length offset  $K$ , see Figure 4, for profiles with a thermal barrier shall be within the tolerance range for the fixed length specified in Table 2, e.g. for a fixed length tolerance of  $+_{0}^{10}$  mm the length offset shall be within 10 mm.



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#### Key

- 1 length of profile
- 2 profile 1
- 3 thermal barrier
- 4 profile 2

Figure 4 — Length offset  $K$

## 4 Tolerances on form

### 4.1 Plane parallelism

Requirements on plane parallelism // of opposite outer planes shall be subject of agreement between supplier and purchaser and shall be specified on the drawing.

Plane parallelism shall be marked on the drawing as specified in Figure 5, using the // symbol as in EN ISO 1101.

Tolerances on plane parallelism shall not increase tolerances on dimensions, i.e. shall always lie within dimensional tolerances or tolerance ranges.

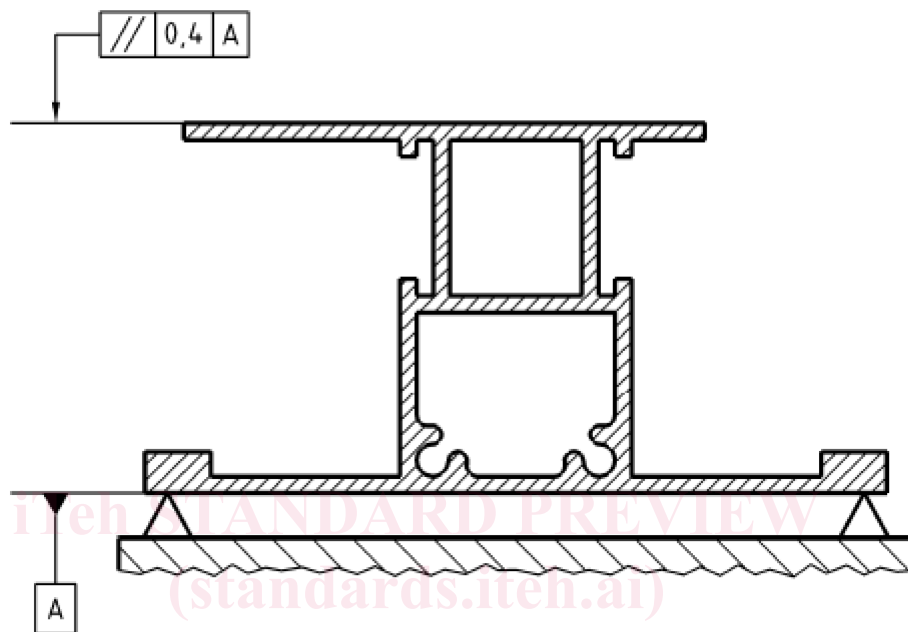
Where outer planes are of unequal length, the longer one shall be taken as contact reference.

Two clearly defined reference points shall specify the width of the plane parallelism measurement.

The tolerance on plane parallelism // for outer parallel dimension H apply for cross sectional measurements in a single plane. The value for parallelism may be selected in accordance with the tolerance range given in Table 1 (including those for open ends).

Example Dimension  $H = 50 \pm 0,4$ , i.e. possible plane parallelism //0,8.

Requirements in Figure 5 (//, 0,4) is an example only. Tolerances to be according to Table 1:



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**Figure 5 — Marking plane parallelism for convex and concave surfaces**

## 4.2 Straightness

Deviations from straightness,  $h_s$  and  $h_t$  shall be measured as shown in Figure 7 a) and b), with the profile placed on a horizontal base plate so that its mass decreases the deviation.

The straightness tolerance  $h_t$  shall be as specified in Table 4.

The local deviation from straightness  $h_s$  shall not exceed 0,3 mm per 300 mm length.