
**Wrought aluminium and aluminium
alloys — Extruded rods/bars, tubes
and profiles —**

**Part 3:
Tolerances on form and dimensions
for extruded rectangular bars**

*Aluminium et alliages d'aluminium corroyés — Barres, tubes et
profilés filés —*

*Partie 3: Tolerances sur forme et dimensions pour barres
rectangulaires filées*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 79, *Light metals and their alloys*, Subcommittee SC 6, *Wrought aluminium and aluminium alloys*.

This fourth edition cancels and replaces the third edition (ISO 6362-3:2012), which has been technically revised. The main changes are as follows:

- in [Clause 4](#), Table 1 has been separated into [Table 1](#) and [Table 2](#) by alloy group;
- in [Clause 4](#), alloys 3203 and 6026 have been added to [Table 1](#) and alloy 2033 has been added to [Table 2](#);
- errors have been corrected and expressions modified throughout.

A list of all parts in the ISO 6362 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Wrought aluminium and aluminium alloys — Extruded rods/bars, tubes and profiles —

Part 3: Tolerances on form and dimensions for extruded rectangular bars

1 Scope

This document specifies the tolerances on dimensions and shape of wrought aluminium and aluminium alloy extruded rectangular bars, having thicknesses in the range from 2 mm up to 240 mm and widths in the range from 10 mm up to 600 mm.

It is applicable to extruded rectangular bars.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6362-1, *Wrought aluminium and aluminium alloys — Extruded rods/bars, tubes and profiles — Part 1: Technical conditions for inspection and delivery*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6362-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Materials

Alloys mentioned in this document are listed in ISO 6362-7.

NOTE Four-digit numerical designations are completely identical with Registration of International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys (known as “Teal sheets”)^[1].

For the purposes of this document, wrought aluminium and aluminium alloys are divided into two groups, which correspond to varying difficulty when manufacturing the products.

The division of the most commonly alloys used in general engineering into Group I and Group II is specified in [Table 1](#) and [Table 2](#), respectively.

Grouping of other alloys is subject to agreement between the purchaser and the supplier.

Table 1 — Alloy Group I

Alloy system	Alloy number
Pure aluminium	1070, 1070A, 1060, 1050, 1050A, 1350, 1100, 1200
Al-Mn system alloy	3102, 3003, 3103, 3203
Al-Mg system alloy	5005, 5005A, 5051A, 5251
Al-Mg-Si system alloy	6101, 6101A, 6101B, 6005, 6005A, 6005C, 6026, 6110A, 6012, 6018, 6023, 6351, 6060, 6360, 6061, 6261, 6262, 6262A, 6063, 6063A, 6463, 6065, 6081, 6082, 6182

Table 2 — Alloy Group II (all aluminium alloys except those given in alloy Group I)

Alloy system	Alloy number
Al-Mg system alloy	5019, 5049, 5052, 5154A, 5454, 5754, 5056, 5083, 5086
Al-Cu-Mg system alloy	2007, 2011, 2011A, 2014, 2014A, 2017, 2017A, 2024, 2030, 2033
Al-Zn-Mg system alloy	7003, 7204, 7005, 7108, 7108A, 7020, 7021, 7022, 7049A, 7050, 7075

5 Tolerances on form and dimensions

5.1 Dimensional tolerances

5.1.1 Tolerances on width and thickness

Tolerances on width and thickness shall be in accordance with [Tables 3](#) and [4](#).

Table 3 — Tolerances on width and thickness for alloy Group I

Dimensions in millimetres

Width <i>b</i>		Thickness <i>t</i> tolerances for thickness ranges								
Range	Tolerances	$2 \leq t \leq 6$	$6 < t \leq 10$	$10 < t \leq 18$	$18 < t \leq 30$	$30 < t \leq 50$	$50 < t \leq 80$	$80 < t \leq 120$	$120 < t \leq 180$	$180 < t \leq 240$
$10 \leq b \leq 18$	$\pm 0,25$	$\pm 0,20$	$\pm 0,25$	$\pm 0,25$	—	—	—	—	—	—
$18 < b \leq 30$	$\pm 0,30$	$\pm 0,20$	$\pm 0,25$	$\pm 0,30$	$\pm 0,30$	—	—	—	—	—
$30 < b \leq 50$	$\pm 0,40$	$\pm 0,25$	$\pm 0,25$	$\pm 0,30$	$\pm 0,35$	$\pm 0,40$	—	—	—	—
$50 < b \leq 80$	$\pm 0,60$	$\pm 0,25$	$\pm 0,30$	$\pm 0,35$	$\pm 0,40$	$\pm 0,50$	$\pm 0,60$	—	—	—
$80 < b \leq 120$	$\pm 0,80$	$\pm 0,30$	$\pm 0,35$	$\pm 0,40$	$\pm 0,45$	$\pm 0,60$	$\pm 0,70$	$\pm 0,80$	—	—
$120 < b \leq 180$	$\pm 1,0$	—	—	$\pm 0,50$	$\pm 0,55$	$\pm 0,60$	$\pm 0,70$	$\pm 0,90$	$\pm 1,0$	—
$180 < b \leq 240$	$\pm 1,4$	—	—	—	$\pm 0,65$	$\pm 0,70$	$\pm 0,80$	$\pm 1,0$	$\pm 1,2$	$\pm 1,4$
$240 < b \leq 350$	$\pm 1,8$	—	—	—	$\pm 0,75$	$\pm 0,80$	$\pm 0,90$	$\pm 1,1$	$\pm 1,3$	$\pm 1,5$
$350 < b \leq 450$	$\pm 2,2$	—	—	—	—	$\pm 0,90$	$\pm 1,0$	$\pm 1,2$	$\pm 1,4$	$\pm 1,6$
$450 < b \leq 600$	$\pm 3,0$	—	—	—	—	$\pm 0,90$	$\pm 1,0$	$\pm 1,4$	—	—
When the tolerance is specified either all plus or minus side, the value in this table shall be doubled.										

Table 4 — Tolerances on width and thickness for alloy Group II

Dimensions in millimetres

Width <i>b</i>		Thickness <i>t</i> tolerances for thickness ranges								
Range	Tolerances	$2 \leq t \leq 6$	$6 < t \leq 10$	$10 < t \leq 18$	$18 < t \leq 30$	$30 < t \leq 50$	$50 < t \leq 80$	$80 < t \leq 120$	$120 < t \leq 180$	$180 < t \leq 240$
$10 \leq b \leq 18$	$\pm 0,35$	$\pm 0,25$	$\pm 0,30$	$\pm 0,35$	—	—	—	—	—	—
$18 < b \leq 30$	$\pm 0,40$	$\pm 0,25$	$\pm 0,30$	$\pm 0,40$	$\pm 0,40$	—	—	—	—	—
$30 < b \leq 50$	$\pm 0,50$	$\pm 0,30$	$\pm 0,30$	$\pm 0,40$	$\pm 0,50$	$\pm 0,50$	—	—	—	—
$50 < b \leq 80$	$\pm 0,70$	$\pm 0,30$	$\pm 0,35$	$\pm 0,45$	$\pm 0,60$	$\pm 0,70$	$\pm 0,70$	—	—	—
$80 < b \leq 120$	$\pm 1,0$	$\pm 0,35$	$\pm 0,40$	$\pm 0,50$	$\pm 0,60$	$\pm 0,70$	$\pm 0,80$	$\pm 1,0$	—	—
$120 < b \leq 180$	$\pm 1,4$	—	—	$\pm 0,55$	$\pm 0,70$	$\pm 0,80$	$\pm 1,0$	$\pm 1,1$	$\pm 1,4$	—
$180 < b \leq 240$	$\pm 1,8$	—	—	—	$\pm 0,70$	$\pm 0,90$	$\pm 1,1$	$\pm 1,3$	$\pm 1,6$	$\pm 1,8$
$240 < b \leq 350$	$\pm 2,2$	—	—	—	$\pm 0,80$	$\pm 0,90$	$\pm 1,2$	$\pm 1,4$	$\pm 1,7$	$\pm 1,9$
$350 < b \leq 450$	$\pm 2,8$	—	—	—	—	$\pm 1,1$	$\pm 1,4$	$\pm 1,8$	$\pm 2,1$	$\pm 2,3$
$450 < b \leq 600$	$\pm 3,5$	—	—	—	—	$\pm 1,2$	$\pm 1,4$	$\pm 1,8$	—	—

When the tolerance is specified either all plus or minus side, the value in this table shall be doubled.

5.1.2 Corner radii

Maximum corner radii shall be in accordance with [Table 5](#).

Table 5 — Maximum value of corner radii

Dimensions in millimetres

Thickness <i>t</i>	Maximum value of corner radii	
	Alloy Group I	Alloy Group II
$2 \leq t \leq 10$	0,6	1,0
$10 < t \leq 30$	1,0	1,5
$30 < t \leq 80$	1,8	2,5
$80 < t \leq 120$	2,0	3,0
$120 < t \leq 180$	2,5	4,0
$180 < t \leq 240$	3,5	5,0

5.1.3 Fixed-length tolerances

If fixed lengths are supplied, their permissible tolerances on fixed lengths are given in [Table 6](#).

Table 6 — Fixed-length tolerances

Dimensions in millimetres

Width <i>b</i>	Tolerances on fixed length		
	$L \leq 2\,000$	$2\,000 < L \leq 5\,000$	$5\,000 < L \leq 8\,000$
$b \leq 100$	$\begin{smallmatrix} +5 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +7 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +10 \\ 0 \end{smallmatrix}$
$100 < b \leq 200$	$\begin{smallmatrix} +7 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +9 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +12 \\ 0 \end{smallmatrix}$
$200 < b \leq 450$	$\begin{smallmatrix} +8 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +11 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +14 \\ 0 \end{smallmatrix}$
$450 < b \leq 600$	$\begin{smallmatrix} +9 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +12 \\ 0 \end{smallmatrix}$	$\begin{smallmatrix} +16 \\ 0 \end{smallmatrix}$

5.1.4 Squareness of cut ends

The squareness of cut ends shall be within half of the fixed-length tolerance range specified in [Table 5](#) for both fixed and random lengths. For example, for a fixed-length tolerance of $^{+10}_0$ mm, the squareness of cut ends shall be within 5 mm.

5.2 Form tolerances

5.2.1 General

The shape tolerances specified in [5.2.2](#) to [5.2.4](#) apply to all tempers, except tempers O, H111, H112 and TX510 type tempers.

The deviation shall be measured with the bar supported on a horizontal base plate, such that the deviation is minimized by the mass of the bar.

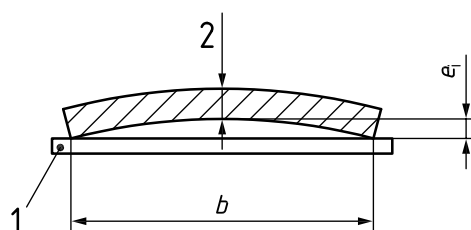
5.2.2 Flatness tolerances

Flatness tolerances shall be in accordance with [Table 7](#). The deviation from flatness e shall be measured in accordance with [Figure 1](#).

Table 7 — Flatness tolerances

Dimensions in millimetres

Width b	Tolerances for convexity or concavity e
$10 \leq b \leq 30$	0,2
$30 < b \leq 50$	0,3
$50 < b \leq 80$	0,4
$80 < b \leq 120$	0,6
$120 < b \leq 180$	0,9
$180 < b \leq 240$	1,2
$240 < b \leq 350$	1,5
$350 < b \leq 450$	2,0
$450 < b \leq 600$	2,5



Key

- 1 base plate
- 2 thickness
- b width
- e_i deviation from flatness

Figure 1 — Measurement of deviation from flatness

5.2.3 Straightness tolerances

The straightness tolerances shall be in accordance with [Table 8](#).

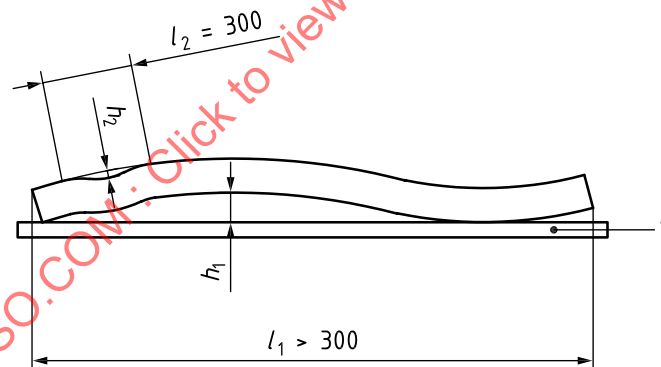
Table 8 — Straightness tolerances

Dimensions in millimetres

Width b	Thickness t	Straightness tolerances	
		Per 1 000 mm of total length (l_1) h_1	In any 300 mm (l_2) h_2
$10 \leq b \leq 80$	$10 \leq t \leq 80$	2	1
$80 < b \leq 120$	$10 \leq t \leq 50$	2	1
	$50 < t \leq 120$	3	1,5
$120 < b \leq 180$	$10 \leq t \leq 50$	3	1,5
	$50 < t \leq 180$	4	2
$180 < b \leq 350$	$10 \leq t \leq 50$	4	2
	$50 < t \leq 240$	6	4
$350 < b \leq 450$	$10 \leq t \leq 240$	6	4
$450 < b \leq 600$	$30 < t \leq 120$	6	4

The deviations from straightness h_1 and h_2 shall be measured as shown in [Figure 2](#), with the bar placed on a horizontal base plate so that its mass decreases the deviation.

Dimensions in millimetres



Key

1 base plate

Figure 2 — Measurement of deviation from straightness

5.2.4 Twist tolerances

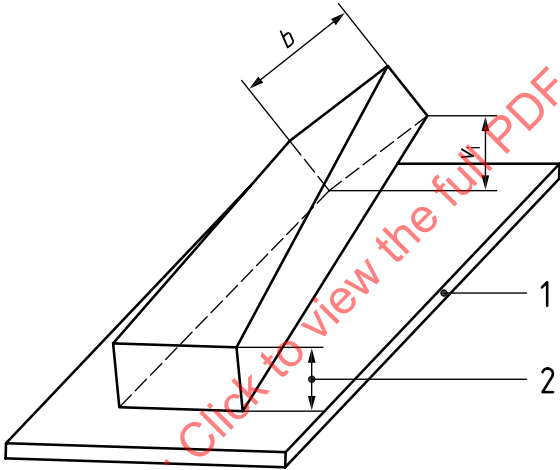
Twist tolerances shall be in accordance with [Table 9](#).

The twist v_1 shall be measured in accordance with [Figure 3](#).

Table 9 — Twist tolerances

Dimensions in millimetres

Width <i>b</i>	Tolerances on twist	
	<i>v_i</i> Per 1 000 mm of length	5 000 or less of the total length
$10 \leq b \leq 30$	1	3
$30 < b \leq 50$	1,5	4
$50 < b \leq 120$	2	5
$120 < b \leq 240$	3	8
$240 < b \leq 350$	4	10
$350 < b \leq 450$	5	12
$450 < b \leq 600$	6	14



- Key**
- 1 base plate
 - 2 thickness
 - b* width
 - v_i* twist

Figure 3 — Measurement of twist

5.2.5 Squareness tolerances

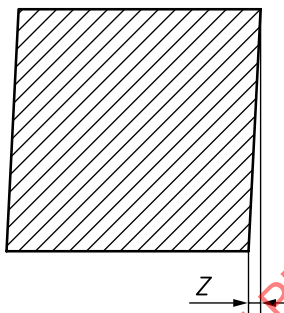
Squareness tolerances are specified in [Table 10](#).

The deviation from square shall be measured as shown in [Figure 4](#).

Table 10 — Squareness tolerances

Dimensions in millimetres

Thickness t	Maximum deviation from square Z
$2 \leq t \leq 10$	0,1
$10 < t \leq 100$	$0,01 \times t$
$100 < t \leq 180$	1,0
$180 < t \leq 240$	1,5

**Key** Z maximum deviation from square**Figure 4 — Measurement of deviation from square (cross-section)**