INTERNATIONAL STANDARD

ISO 6363-4

Third edition
2022-07

Wrought aluminium and aluminium alloys — Cold-drawn rods/bars, tubes and wires —

Part 4: Tolerances on form and dimensions for drawn rectangular bars and wires

Aluminium et alliages d'aluminium corroyés — Barres, tubes et fils étirés à froid —

Partie 4: Tolérances sur forme et dimensions pour barres rectangulaires et fils étirés

Reference number
ISO 6363-4:2022(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 third edition cancels and replaces the second edition (ISO 6363-4:2012), 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, alloy 6026 has 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 6363 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 — Cold-drawn rods/bars, tubes and wires —

Part 4: Tolerances on form and dimensions for drawn rectangular bars and wires

1 Scope

This document specifies the tolerances on form and dimensions of wrought aluminium and aluminium alloy drawn rectangular bars and wires with thicknesses ranging from 2 mm up to and including 60 mm and widths up to and including 200 mm.

For wires, this document does not apply to electrical, welding and aeronautical purposes.

For drawn bars, 5.1 to 5.4 apply, and only 5.1 applies to drawn wires.

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 6363-1, *Wrought aluminium and aluminium alloys — Cold-drawn rods/bars, tubes and wires — 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 6363-1 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 whenever 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	1050, 1050A, 1070, 1080A, 1098, 1100, 1200, 1350
Al-Mn system alloy	3003, 3102, 3103, 3203
Al-Mg system alloy	5005, 5005A, 5050, 5051, 5051A
Al-Mg-Si system alloy	6005, 6005A, 6005C, 6008, 6012, 6014, 6018, 6026, 6056, 6060, 6061, 6063, 6063A, 6065, 6081, 6082, 6101, 6101A, 6101B, 6110A, 6181, 6261, 6262, 6262A, 6351, 6360, 6463

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

Alloy system	Alloy number
Al-Cu-Mg system alloy	2007, 2011, 2011A, 2014, 2014A, 2017, 2017A, 2117, 2024, 2030, 2033, 2219
Al-Mg system alloy	5019, 5041, 5049, 5052, 5056, 5083, 5086, 5154, 5154A, 5251, 5454, 5754
Al-Zn-Mg system alloy	7003, 7005, 7020, 7021, 7022, 7049A, 7050, 7075, 7108, 7108A, 7204

5 Tolerances on form and dimensions

5.1 Tolerances on width and thickness

The tolerances on width and thickness shall be in accordance with Tables 3 and 4.

The dimensions shall be measured without influence from the corner radii.

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

Dimensions in millimetres

Width[a] b		Thickness a tolerances for thickness ranges[a]					
Range	**Tolerances**	$2 \le a \le 6$	$6 < a \le 10$	$10 < a \le 18$	$18 < a \le 30$	$30 < a \le 40$	$40 < a \le 60$
$b \le 10$	±0,08	±0,06	±0,08	—	—	—	—
$10 < b \le 18$	±0,10	±0,06	±0,08	±0,10	—	—	—
$18 < b \le 30$	±0,15	±0,06	±0,08	±0,10	±0,15	—	—
$30 < b \le 50$	±0,20	±0,08	±0,10	±0,12	±0,15	±0,20	—
$50 < b \le 80$	±0,25	±0,10	±0,10	±0,12	±0,15	±0,20	±0,25
$80 < b \le 120$	±0,28	—	±0,12	±0,15	±0,20	±0,25	±0,30
$120 < b \le 160$	±0,32	—	—	±0,15	±0,20	±0,30	±0,35
$160 < b \le 200$	±0,35	—	—	±0,20	±0,25	±0,35	±0,40

[a] If $b/a > 10$, the permissible tolerances shall be agreed upon.

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

Dimensions in millimetres

Width[a] b		Thickness a tolerances for thickness ranges[a]					
Range	**Tolerances**	$2 \le a \le 6$	$6 < a \le 10$	$10 < a \le 18$	$18 < a \le 30$	$30 < a \le 40$	$40 < a \le 60$
$b \le 10$	±0,12	±0,09	±0,12	—	—	—	—
$10 < b \le 18$	±0,15	±0,09	±0,12	±0,15	—	—	—
$18 < b \le 30$	±0,23	±0,09	±0,12	±0,15	±0,23	—	—
$30 < b \le 50$	±0,30	±0,12	±0,15	±0,18	±0,23	±0,30	—
$50 < b \le 80$	±0,38	±0,15	±0,15	±0,18	±0,23	±0,30	±0,38
$80 < b \le 120$	±0,42	—	±0,18	±0,23	±0,30	±0,38	±0,45
$120 < b \le 160$	±0,48	—	—	±0,23	±0,30	±0,45	±0,53
$160 < b \le 200$	±0,53	—	—	±0,30	±0,38	±0,53	±0,60

[a] If $b/a > 10$, the permissible tolerances shall be agreed upon.

5.2 Fixed-length tolerances

If fixed-length bars are ordered, their maximum permissible length tolerances shall be in accordance with Table 5.

Table 5 — Fixed-length tolerances

Dimensions in millimetres

Width b	Tolerances on fixed lengths			
	$L \le 250$	$250 < L \le 1\,000$	$1\,000 < L \le 2\,000$	$2\,000 < L \le 5\,000$
$b \le 30$	$^{+1}_{0}$	$^{+2}_{0}$	$^{+3}_{0}$	$^{+5}_{0}$
$30 < b \le 50$	$^{+2}_{0}$	$^{+3}_{0}$	$^{+4}_{0}$	$^{+6}_{0}$
$50 < b \le 120$	$^{+2,5}_{0}$	$^{+4}_{0}$	$^{+5}_{0}$	$^{+7}_{0}$
$120 < b \le 200$	$^{+3}_{0}$	$^{+5}_{0}$	$^{+6}_{0}$	$^{+8}_{0}$

5.3 Squareness of cut ends

Squareness of cut ends shall be within half of the fixed length tolerance range (see Table 5) for both fixed and random lengths. For example, for a fixed-length tolerance of $^{+2}_{0}$ mm, the squareness of cut ends shall be within 1 mm.

5.4 Corner radii

The corners of the bars shall be slightly rounded, but the corner radii shall not exceed the values specified in Table 6.

Table 6 — Maximum corner radii

Dimensions in millimetres

Thickness *a*	Maximum corner radii	
	Alloy Group I	Alloy Group II
$a \leq 10$	0,4	0,6
$10 < a \leq 40$	0,8	1,0
$40 < a \leq 60$	1,5	2,0

5.5 Form tolerances

5.5.1 General

The maximum form tolerances specified in 5.5.2 to 5.5.4 apply to all tempers, except temper O and TX51.

Form tolerances are measured by placing the bar on a horizontal plate under its own mass as shown in Figures 1 to 3.

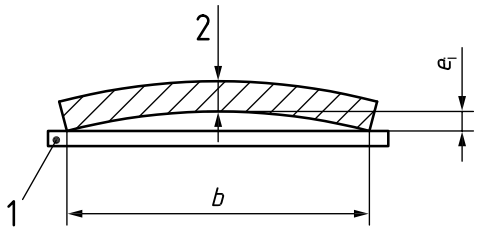
5.5.2 Flatness tolerances

The maximum allowable flatness tolerances, *e*, shall be in accordance with Table 7. The deviation from flatness, e_i, shall be measured in accordance with Figure 1.

Table 7 — Flatness tolerances

Dimensions in millimetres

Width *b*	Flatness tolerance *e*
$b \leq 30$	0,2
$30 < b \leq 50$	0,3
$50 < b \leq 80$	0,4
$80 < b \leq 120$	0,6
$120 < b \leq 200$	0,9



Key

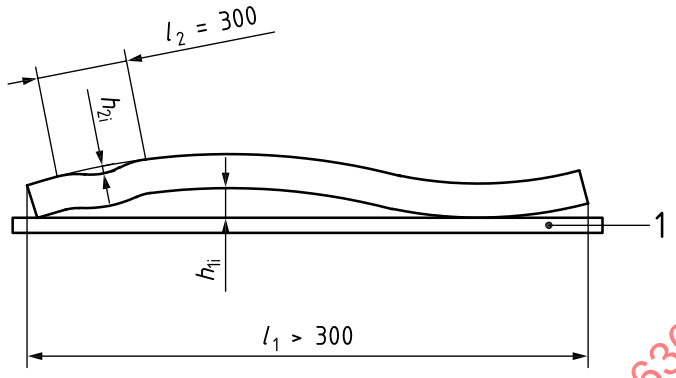
1 base plate
2 thickness
b width
e_i deviation from flatness

Figure 1 — Measurement of deviation from flatness

5.5.3 Straightness tolerances

The maximum allowable straightness tolerance, h, for the total length, l, shall be 2 mm per 1 000 mm of length (see Figure 2). In addition, h_2 shall not exceed 0,6 mm for each section of 300 mm length (l_2).

Dimensions in millimetres



Key

1 base plate

Figure 2 — Measurement of deviation from straightness

5.5.4 Twist tolerance

The maximum allowable twist tolerances shall be in accordance with Table 8.

The twist, v_i, shall be measured as shown in Figure 3.

For rectangular bars with width less than 10 mm, the twist tolerances shall be agreed between the purchaser and the supplier.

Table 8 — Twist tolerances

Dimensions in millimetres

Width b	Twist tolerances v	
	Per 1 000 mm of length	Over the total length
		$L \leq 5\,000$
$10 \leq b \leq 30$	1,5	3
$30 < b \leq 50$	2	5
$50 < b \leq 120$	3	7
$120 < b \leq 200$	4	10