INTERNATIONAL STANDARD

ISO 6363-4

Second edition
2012-07-15

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

Part 4: Drawn rectangular bars and wires — Tolerances on form and dimensions

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

Partie 4: Barres rectangulaires et fils étirés — Tolérances sur forme et dimensions

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6363-4 was prepared by Technical Committee ISO/TC 79, *Light metals and their alloys*, Subcommittee SC 6, *Wrought aluminium and aluminium alloys*.

This second edition cancels and replaces the first edition (ISO 6363-4:1991), which has been technically revised.

ISO 6363 consists of the following parts, under the general title *Wrought aluminium and aluminium alloys — Cold-drawn rods/bars, tubes and wires*:

— *Part 1: Technical conditions for inspection and delivery*

— *Part 2: Mechanical properties*

— *Part 3: Drawn round bars and wires — Tolerances on form and dimensions (symmetric plus and minus tolerances on diameter)*

— *Part 4: Drawn rectangular bars and wires — Tolerances on form and dimensions*

— *Part 5: Drawn square and hexagonal bars and wires — Tolerances on form and dimensions*

— *Part 6: Drawn round tubes — Tolerances on form and dimensions*

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

Part 4: Drawn rectangular bars and wires — Tolerances on form and dimensions

1 Scope

This part of ISO 6363 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 part of ISO 6363 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 referenced documents are indispensable for the application 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.

4 Materials

For the purposes of this part of ISO 6363, wrought aluminium and aluminium alloys are divided into two groups, which correspond to varying difficulty whenever manufacturing the products.

The division into group I and group II of the most commonly used general engineering alloys is specified in Table 1. 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 the purchaser and supplier.

Table 1 — Alloy group

Group I	1050, 1050A, 1070, 1100, 1200, 1350 3003, 3102, 3103, 3203 5005, 5005A, 5050, 5051, 5051A 6005, 6005A, 6005C, 6008, 6012, 6014, 6018, 6056, 6060, 6061, 6063, 6063A, 6065, 6081, 6082, 6101, 6101A, 6101B, 6110A, 6181, 6261, 6262, 6262A, 6351, 6360, 6463
Group II	2007, 2011, 2011A, 2014, 2014A, 2017, 2017A, 2024, 2030, 2219 5019, 5041, 5049, 5052, 5056, 5083, 5086, 5154, 5154A, 5251, 5454, 5754 7003, 7005, 7020, 7021, 7022, 7049A, 7050, 7075, 7108, 7108A, 7204
NOTE The four-digit numbers listed in this table are taken from the Registration of International Alloy Designations and Chemical Composition Limits for Wrought Aluminium Alloys (also known as “Teal sheets”)[1].	

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 2 and 3.

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

Table 2 — Tolerances on width and thickness for alloy group I

Dimensions in millimetres

Width[a] b		**Thickness a tolerances for thickness ranges**[a]					
Range	**Tolerances**	**$2 \leq a \leq 6$**	**$6 < a \leq 10$**	**$10 < a \leq 18$**	**$18 < a \leq 30$**	**$30 < a \leq 40$**	**$40 < a \leq 60$**
$b \leq 10$	±0,08	±0,06	±0,08	–	–	–	–
$10 < b \leq 18$	±0,10	±0,06	±0,08	±0,10	–	–	–
$18 < b \leq 30$	±0,15	±0,06	±0,08	±0,10	±0,15	–	–
$30 < b \leq 50$	±0,20	±0,08	±0,10	±0,12	±0,15	±0,20	–
$50 < b \leq 80$	±0,25	±0,10	±0,10	±0,12	±0,15	±0,20	±0,25
$80 < b \leq 120$	±0,28	–	±0,12	±0,15	±0,20	±0,25	±0,30
$120 < b \leq 160$	±0,32	–	–	±0,15	±0,20	±0,30	±0,35
$160 < b \leq 200$	±0,35	–	–	±0,20	±0,25	±0,35	±0,40
[a] If $b/a > 10$, the permissible tolerances shall be agreed upon.							

Table 3 — Tolerances on width and thickness for alloy group II

Dimensions in millimetres

Width[a] b		Thickness a tolerances for thickness ranges[a]					
Range	Tolerances	$2 \leq a \leq 6$	$6 < a \leq 10$	$10 < a \leq 18$	$18 < a \leq 30$	$30 < a \leq 40$	$40 < a \leq 60$
$b \leq 10$	±0,12	±0,09	±0,12	–	–	–	–
$10 < b \leq 18$	±0,15	±0,09	±0,12	±0,15	–	–	–
$18 < b \leq 30$	±0,23	±0,09	±0,12	±0,15	±0,23	–	–
$30 < b \leq 50$	±0,30	±0,12	±0,15	±0,18	±0,23	±0,30	–
$50 < b \leq 80$	±0,38	±0,15	±0,15	±0,18	±0,23	±0,30	±0,38
$80 < b \leq 120$	±0,42	–	±0,18	±0,23	±0,30	±0,38	±0,45
$120 < b \leq 160$	±0,48	–	–	±0,23	±0,30	±0,45	±0,53
$160 < b \leq 200$	±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 4.

Table 4 — Fixed-length tolerances

Dimensions in millimetres

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

5.3 Squareness of cut ends

Squareness of cut ends shall be within half of the fixed length tolerance range (Table 4) 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 5.

Table 5 — 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.

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

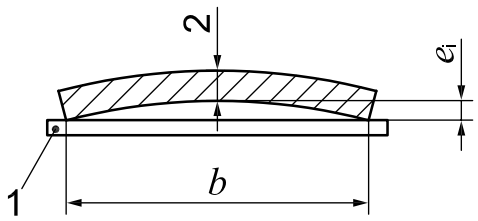
5.5.2 Flatness tolerances

The maximum allowable flatness tolerances, e, shall be in accordance with Table 6. The deviation from flatness, e_i, shall be measured in accordance with Figure 1.

Table 6 — 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

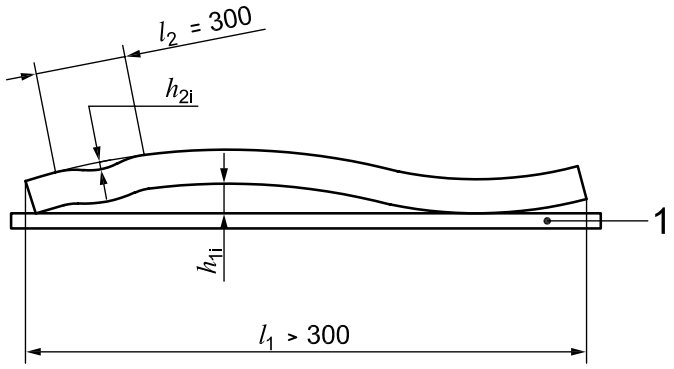
1 base plate
2 thickness
b width
e_i deviation from flatness

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 7.

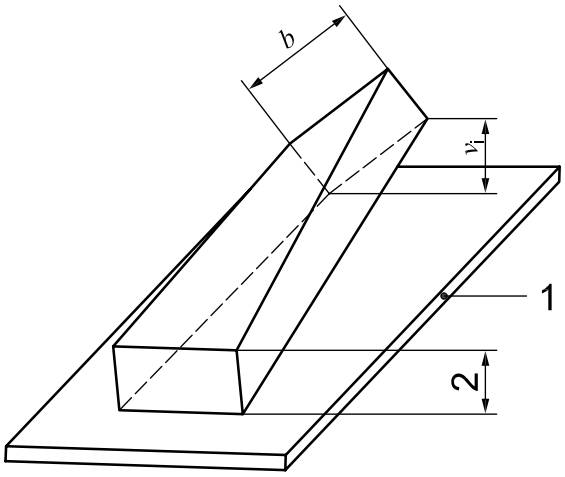
The twist, v_i, shall be measured as shown in Figure 3.

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

Table 7 — Twist tolerances

Dimensions in millimetres

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



Key

1 base plate
2 thickness
b width
v_i twist

Figure 3 — Measurement of twist

5.5.5 Squareness tolerances

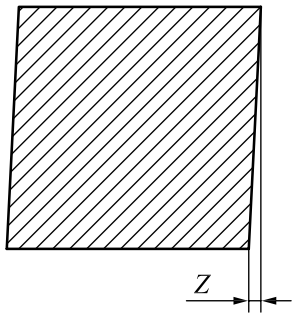
Squareness tolerances are specified in Table 8.

The deviation from square shall be measured as shown in Figure 4.

Table 8 — Squareness tolerances

Dimensions in millimetres

Thickness a	Maximum deviation from square Z
$2 \leq a \leq 60$	$0{,}005 \times a$



Key

Z maximum deviation from square

Figure 4 — Measurement of deviation from square

Bibliography

[1] *Registration of International Alloy Designations and Chemical Composition Limits for Wrought Aluminium Alloys* (also known as “Teal sheets”). The Aluminum Association, Arlington, VA. Available at: http://www.aluminum.org/tealsheets

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