INTERNATIONAL STANDARD

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

Part 5: Tolerances on form and dimensions for drawn square and hexagonal bars and wires

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

Partie 5: Tolérances sur forme et dimensions pour barres carrées et hexagonales et fils étirés

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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 6363-5:2012), which has been technically revised. The main changes are as follows:

— 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 5: Tolerances on form and dimensions for drawn square and hexagonal bars and wires

1 Scope

This document specifies the tolerances on form and dimensions of wrought aluminium and aluminium alloy drawn square and hexagonal bars and wires with widths across flats up to and including 100 mm.

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

For drawn bars, 4.1 to 4.5 apply, and only 4.1 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 Tolerances on form and dimensions

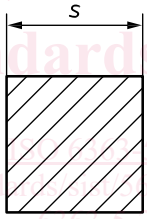
4.1 Tolerances on width across flats

Tolerances on width across flats shall be in accordance with the plus and minus tolerances or the minus tolerance given in Table 1. The choice of tolerances depends on the agreement between the purchaser and the supplier.

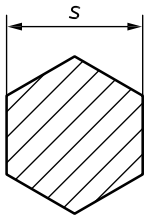
Table 1 — Tolerances on width across flats

Dimensions in millimetres

Width across flats s	Plus and minus tolerances	Maximum allowable deviation
$s \leq 3$	±0,05	$^{0}_{-0,06}$
$3 < s \leq 6$	±0,05	$^{0}_{-0,08}$
$6 < s \leq 10$	±0,05	$^{0}_{-0,09}$
$10 < s \leq 18$	±0,06	$^{0}_{-0,11}$
$18 < s \leq 30$	±0,08	$^{0}_{-0,13}$
$30 < s \leq 50$	±0,13	$^{0}_{-0,16}$
$50 < s \leq 65$	±0,16	$^{0}_{-0,20}$
$65 < s \leq 80$	±0,20	$^{0}_{-0,30}$
$80 < s \leq 100$	±0,30	$^{0}_{-0,35}$



a) Square bar



b) Hexagonal bar

Key

s width across flats

Figure 1 — Widths across flats

4.2 Fixed-length tolerances

If fixed-length bars are ordered, their length tolerances shall be in accordance with Table 2.

Table 2 — Fixed-length tolerances

Dimensions in millimetres

Width across flats s	Tolerances on fixed lengths			
	$L \leq 250$	$250 < L \leq 1\,000$	$1\,000 < L \leq 2\,000$	$2\,000 < L \leq 5\,000$
$s \leq 30$	$^{+1}_{0}$	$^{+2}_{0}$	$^{+3}_{0}$	$^{+5}_{0}$
$30 < s \leq 50$	$^{+2}_{0}$	$^{+3}_{0}$	$^{+4}_{0}$	$^{+6}_{0}$
$50 < s \leq 100$	$^{+2,5}_{0}$	$^{+4}_{0}$	$^{+5}_{0}$	$^{+7}_{0}$

4.3 Squareness of cut ends

The squareness of cut ends shall be within half of the fixed length tolerance range (see Table 2) 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.

4.4 Corner radii

The corners of the bars shall be slightly rounded, but the corner radii shall not exceed the values specified in Table 3.

Table 3 — Maximum corner radii

Dimensions in millimetres

Width across flats s	Maximum corner radii
$s \leq 10$	0,4
$10 < s \leq 40$	0,8
$40 < s \leq 80$	1,2
$80 < s \leq 100$	2,0

4.5 Form tolerances

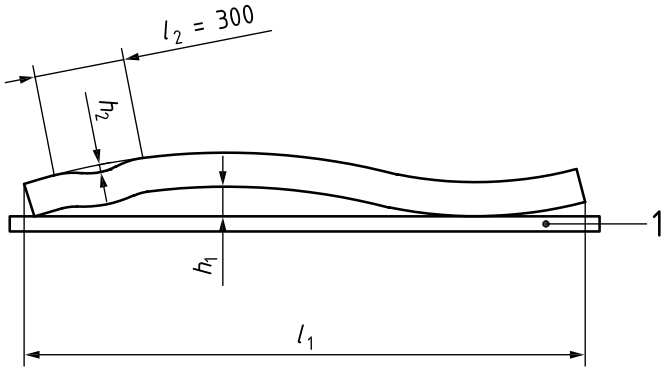
4.5.1 General

The maximum tolerance values specified in 4.5.2 and 4.5.3 apply to all tempers, except temper O, H111 and TX51.

Form tolerances are measured by placing the bar on a horizontal plate under its own mass, as shown in Figures 2 and 3.

4.5.2 Straightness tolerances

The maximum allowable straightness tolerance, h_1, for the total length l_1, 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).



Key

1 base plate

Figure 2 — Measurement of deviation from straightness

4.5.3 Convexity-concavity

The convexity-concavity tolerance for square and hexagonal bars shall be included within the width across flats tolerances as given in Table 1.

4.5.4 Twist tolerances

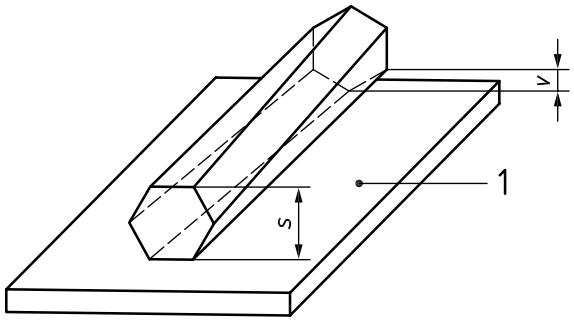
The maximum allowable twist tolerances, v, shall be in accordance with Table 4.

The twist shall be measured as shown in Figure 3.

Table 4 — Twist tolerances

Dimensions in millimetres

Width across flats s	Twist tolerances v	
	Per 1 000 mm of length	Over the total length
		$L \leq 5\,000$
$s \leq 50$	1,5	3
$50 < s \leq 100$	2	5



Key

1 base plate

s width across flats

v twist

Figure 3 — Measurement of twist

4.5.5 Squareness tolerances

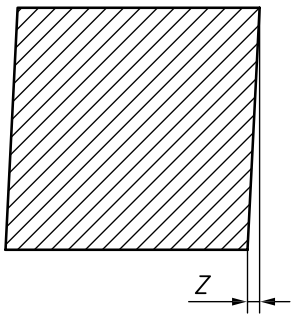
Squareness tolerances are specified in Table 5.

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

Table 5 — Squareness tolerances

Dimensions in millimetres

Width across flats *s*	Maximum deviation from square *Z*
$2 \leq s \leq 100$	$0{,}005 \times s$



Key

Z deviation from square

Figure 4 — Measurement of deviation from square

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