



**International
Standard**

ISO 6362-6

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

**Part 6:
Tolerances on form and dimensions
for round, square, rectangular and
hexagonal tubes**

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

*Partie 6: Tubes ronds, carrés, rectangulaires et hexagonaux —
Tolérances sur forme et dimensions*

**Second edition
2025-03**

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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 document 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).

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This document 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 6362-6:2012), which has been technically revised.

The main changes compared with the previous edition are as follows:

- correction of errors and modification of expressions throughout the document;
- modification of the title in accordance with the other parts;
- addition of an editorial clarification in the Scope;
- addition of alloy 3021 in [Clause 4](#);
- dimensional tolerance increased in [Table 3](#).

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 6: Tolerances on form and dimensions for round, square, rectangular and hexagonal tubes

1 Scope

This document specifies the tolerances on form and dimensions of the following:

- wrought aluminium and aluminium alloy extruded round tubes, having diameters from 13 mm up to 450 mm.
- wrought aluminium and aluminium alloy extruded square, rectangular and hexagonal tubes, having circumscribing circle up to 350 mm in diameter.

This document is applicable to extruded round, square, rectangular and hexagonal tubes.

Four-digit numerical designations are in line with the Registration of International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys (known as "Teal sheets").^[1]

2 Normative references

The following documents are referred to in 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 terminological 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

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 into Group I and Group II of the most commonly used general engineering alloys is specified in [Table 1](#) for seamless tubes and [Table 2](#) for porthole tubes. Grouping of other alloys is subject to agreement between the purchaser and the supplier.

Table 1 — Alloys for seamless tubes

Grouping	Alloy system	Alloy number
Group I	Pure aluminium	1070, 1050, 1050A, 1350, 1100, 1200
	Al-Mn system alloy	3102, 3003, 3103, 3203, 3021
	Al-Mg system alloy	5005, 5005A, 5051A
	Al-Mg-Si system alloy	6101, 6101A, 6101B, 6005, 6005A, 6005C, 6008, 6014, 6060, 6360, 6063, 6063A, 6463
Group II	Al-Cu-Mg system alloy	2007, 2011, 2011A, 2014, 2014A, 2017, 2017A, 2024, 2030
	Al-Mg system alloy	5019, 5049, 5051, 5251, 5052, 5154, 5154A, 5454, 5754, 5056, 5083, 5086
	Al-Mg-Si system alloy	6110A, 6012, 6018, 6351, 6061, 6261, 6262, 6081, 6082
	Al-Zn-Mg system alloy	7003, 7204, 7005, 7108, 7108A, 7020, 7021, 7022, 7049A, 7050, 7075

Table 2 — Alloys for porthole tubes

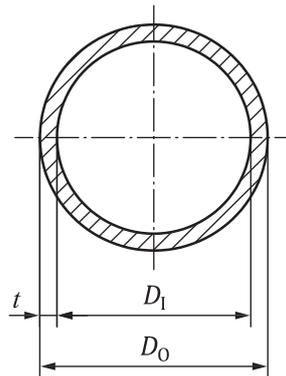
Grouping	Alloy system	Alloy number
Group I	Pure aluminium	1070, 1050, 1050A, 1350, 1100, 1200
	Al-Mn system alloy	3102, 3003, 3103, 3203, 3021
	Al-Mg system alloy	5005, 5005A
	Al-Mg-Si system alloy	6101, 6101A, 6101B, 6005, 6005A, 6005C, 6008, 6014, 6060, 6360, 6063, 6063A, 6463
Group II	Al-Mg system alloy	5051, 5049, 5251, 5052
	Al-Mg-Si system alloy	6110A, 6012, 6018, 6351, 6061, 6261, 6262, 6081, 6082
	Al-Zn-Mg system alloy	7003, 7005, 7108, 7108A, 7020

5 Tolerances on dimensions

5.1 General

When outside diameter, D_0 , inside diameter, D_1 , and wall thickness, t , are all specified, standard tolerances shall apply to any two of these dimensions, but not to all three. As a result, the purchaser shall only state two nominal dimensions on any given order.

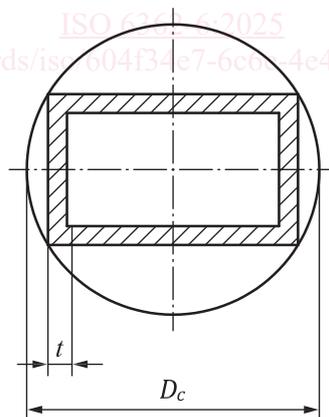
For round tubes, see [Figure 1](#). For all other tubes, see [Figure 2](#).



Key

- D_1 inside diameter
- D_0 outside diameter
- t wall thickness

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Figure 1 — Diameter of a round tube



Key

- D_c circumscribed diameter

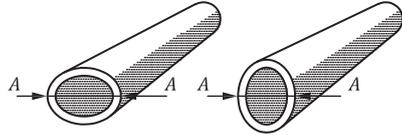
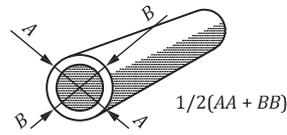
Figure 2 — Circumscribing circle for a tube that is not round

5.2 Tolerances on diameters for round tubes

Tolerances on diameters for round tubes shall be in accordance with [Table 3](#).

Table 3 — Tolerances on diameter for round tubes

Dimensions in millimetres

Diameter D_0 or D_1	Maximum allowable deviation of diameter at any point from specified diameter ^a		Maximum allowable deviation of mean diameter from specified diameter ^b	
				
	Alloy group I ^c	Alloy group II ^c	Alloy group I ^c	Alloy group II ^c
$13 \leq D_0$ or $D_1 \leq 25$	±0,51	±0,76	±0,25	±0,38
$25 < D_0$ or $D_1 \leq 50$	±0,64	±0,97	±0,30	±0,46
$50 < D_0$ or $D_1 \leq 100$	±0,76	±1,14	±0,38	±0,58
$100 < D_0$ or $D_1 \leq 150$	±1,27	±1,91	±0,64	±0,97
$150 < D_0$ or $D_1 \leq 200$	±1,91	±2,87	±0,89	±1,35
$200 < D_0$ or $D_1 \leq 250$	±2,54	±3,81	±1,14	±1,73
$250 < D_0$ or $D_1 \leq 300$	±3,18	±4,78	±1,40	±2,11
$300 < D_0$ or $D_1 \leq 350$	±3,81	±5,72	±1,65	±2,49
$350 < D_0$ or $D_1 \leq 400$	±4,45	±6,68	±1,91	±2,87
$400 < D_0$ or $D_1 \leq 450$	±5,08	±7,62	±2,16	±3,25

When the tolerance is specified only for either the plus or the minus side, the values in Table 3 shall be doubled.
Tolerances on dimensions exceeding the specified range shall be agreed upon between the purchaser and the supplier.

^a These values are not applied to the tubes of temper grade O, coiled tubes and tubes with wall thickness less than 2,5 % of specified outside diameter.

^b The mean diameter is defined as the average value of measurements made at two arbitrary points at right angles to each other.

^c Refer to Table 1 and Table 2.

5.3 Tolerances on width, depth or width across flats — squares, rectangles and hexagons

5.3.1 Seamless tubes

The tolerances on width, depth or width across flats for seamless tubes that are not round are specified in Table 4.

Table 4 — Tolerances on width, depth or width across flats for seamless tubes that are not round ^{a b}

Dimensions in millimetres

Width, depth or width across flats <i>W</i>	$D_C \leq 100$		$100 < D_C \leq 200$		$200 < D_C \leq 300$		$300 < D_C \leq 350$	
	Alloy group ^c							
	I	II	I	II	I	II	I	II
$W \leq 10$	±0,25	±0,40	±0,30	±0,50	±0,35	±0,55	±0,40	±0,60
$10 < W \leq 25$	±0,30	±0,50	±0,40	±0,70	±0,50	±0,80	±0,60	±0,90
$25 < W \leq 50$	±0,50	±0,80	±0,60	±0,90	±0,80	±1,00	±0,90	±1,20
$50 < W \leq 100$	±0,70	±1,00	±0,90	±1,20	±1,10	±1,30	±1,30	±1,60
$50 < W \leq 150$	–	–	±1,10	±1,50	±1,30	±1,70	±1,50	±1,80
$150 < W \leq 200$	–	–	±1,30	±1,90	±1,50	±2,20	±1,80	±2,40
$200 < W \leq 300$	–	–	–	–	±1,70	±2,50	±2,10	±2,80
$300 < W \leq 350$	–	–	–	–	–	–	±2,80	±3,50

^a Not applicable to tubes having a wall thickness less than 2,5 % of the specified outside width, depth or width across flats. The tolerance for tubes with wall thickness less than 2,5 % of the specified width, depth or width across flats shall be determined by multiplying the applicable tolerance as follows:

- wall thickness over 2,0 % up to and including 2,5 % of outside parameter: 1,5 × tolerance;
- wall thickness over 1,5 % up to and including 2,0 % of outside parameter: 2,0 × tolerance;
- wall thickness over 1,0 % up to and including 1,5 % of outside parameter: 3,0 × tolerance;
- wall thickness over 0,5 % up to and including 1,0 % of outside parameter: 4,0 × tolerance.

^b These tolerances do not apply to tempers O and T₅₁₀. For these tempers the tolerances shall be subject to agreement between the supplier and the purchaser.

^c Refer to [Table 1](#).

5.3.2 Porthole tubes

The tolerances on width, depth or width across flats for porthole tubes that are other than round are specified in [Table 5](#).

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Table 5 — Tolerances on width, depth or width across flats for porthole tubes that are not round^{a b}

Dimensions in millimetres

Width, depth or width across flats <i>W</i>	$D_C \leq 100$		$100 < D_C \leq 200$		$200 < D_C \leq 300$		$300 < D_C \leq 350$	
	Alloy group ^c							
	I	II	I	II	I	II	I	II
$W \leq 10$	±0,25	±0,40	±0,30	±0,50	±0,35	±0,55	±0,40	±0,60
$10 < W \leq 25$	±0,30	±0,50	±0,40	±0,70	±0,50	±0,80	±0,60	±0,90
$25 < W \leq 50$	±0,50	±0,80	±0,60	±0,90	±0,80	±1,00	±0,90	±1,20
$50 < W \leq 100$	±0,70	±1,00	±0,90	±1,20	±1,10	±1,30	±1,30	±1,60
$50 < W \leq 150$	–	–	±1,10	±1,50	±1,30	±1,70	±1,50	±1,80
$150 < W \leq 200$	–	–	±1,30	±1,90	±1,50	±2,20	±1,80	±2,40
$200 < W \leq 300$	–	–	–	–	±1,70	±2,50	±2,10	±2,80
$300 < W \leq 350$	–	–	–	–	–	–	±2,80	±3,50

^a Not applicable to tubes having a wall thickness less than 2,5 % of the specified outside width, depth or width across flats. The tolerance for tubes with wall thickness less than 2,5 % of the specified width, depth or width across flats shall be determined by multiplying the applicable tolerance as follows:

- wall thickness over 2,0 % up to and including 2,5 % of outside parameter: 1,5 × tolerance;
- wall thickness over 1,5 % up to and including 2,0 % of outside parameter: 2,0 × tolerance;
- wall thickness over 1,0 % up to and including 1,5 % of outside parameter: 3,0 × tolerance;
- wall thickness over 0,5 % up to and including 1,0 % of outside parameter: 4,0 × tolerance.

^b These tolerances do not apply to tempers O and T₅₁₀. For these tempers the tolerances shall be subject to agreement between the supplier and the purchaser.

^c Refer to [Table 2](#).

5.4 Tolerances on wall thickness for round tubes

The tolerances on wall thickness for round tubes are specified in [Table 6](#).

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