

# INTERNATIONAL STANDARD

ISO  
6361-4

First edition  
1988-04-01



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION  
ORGANISATION INTERNATIONALE DE NORMALISATION  
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

## Wrought aluminium and aluminium alloy sheets, strips and plates —

### Part 4 : Sheets and plates — Tolerances on shape and dimensions

(standards.iteh.ai)

*Tôles, bandes et tôles épaisses en aluminium et en alliages d'aluminium corroyés —*

ISO 6361-4:1988

*Partie 4 : Tôles et tôles épaisses — Tolérances sur forme et dimensions*

853d2207b60/iso-6361-4-1988

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6361-4 was prepared by Technical Committee ISO/TC 79, *Light metals and their alloys*.

[ISO 6361-4:1988](#)

It cancels and replaces Technical Report ISO/TR 7735 : 1982, of which it constitutes a technical revision.

<https://standards.iteh.ai/catalog/standards/sist/bb8ba299-9393-48ad-8077-83bd2207600/iso-6361-4-1988>

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

# Wrought aluminium and aluminium alloy sheets, strips and plates —

## Part 4 : Sheets and plates — Tolerances on shape and dimensions

### 1 Scope and field of application

This part of ISO 6361 specifies the tolerances on shape and dimensions for aluminium and aluminium alloy sheet — corresponding to the definition in ISO 3134-3.

By agreement between purchaser and supplier, the values of tolerances specified in this part of ISO 6361 may be differently disposed about the nominal dimension.

### 2 Reference

ISO 3134-3, *Light metals and their alloys — Terms and definitions — Part 3 : Wrought products.*

### 3 Definition

**sheet** : A flat rolled product of rectangular cross-section with uniform thickness greater than 0,20 mm, supplied in straight lengths (i.e. flat) usually with sheared or sawn edges. The thickness does not exceed one-tenth of the width.

#### NOTES

1 Corrugated, embossed (with patterns, for example grooves, ribs, chequering, tear-drops, nubs, diamonds), coated, edge-conditioned and perforated products in this general form when derived from sheet as defined above are classified as sheet.

2 In some countries, "sheet" of thickness greater than 6,3 mm or 6 mm is called "plate".

### 4 Materials

The alloys are grouped in two categories, A and B, as follows :

#### 4.1 Alloys of category A

- unalloyed aluminium;
- Al-Mn and Al-Mg alloys with a maximum of 1,8 % alloying element;
- Al-MgMn alloys with a maximum of 2,3 % alloying elements (Mg + Mn).

#### 4.2 Alloys of category B

- Al-Mn and Al-Mg alloys with more than 1,8 % alloying element;
- Al-MgMn alloys with more than 2,3 % alloying elements (Mg + Mn);
- heat-treatable wrought alloys of the 2000 (Al-CuMg, Al-CuMgSi) 6000 (Al-MgSi, Al-SiMg) and 7000 (Al-ZnMg, Al-ZnMgCu) series.

### 5 Dimensional tolerances

#### 5.1 Thickness tolerances

5.1.1 Thickness tolerances shall be in accordance with table 1.

5.1.2 Two classes of tolerance are specified for thicknesses over 3,2 mm and up to and including 25 mm.

Class 2 may be applied, for instance, to hot-rolled metal, as specified in some national standards.

The class chosen by the purchaser shall be indicated on the order.

5.1.3 For thicknesses up to and including 25 mm, different tolerances are specified for products made of alloys of category A and category B (see clause 4).

Category A tolerances may be used for special purposes or for alloys named soft alloys in some national standards, and category B may be used for general purposes or for alloys named hard alloys in some national standards, depending upon the requirements of the countries concerned.

5.1.4 The thickness tolerances for sheets of specified width over 3 000 mm shall be chosen by agreement between purchaser and supplier.

#### 5.2 Width tolerances

5.2.1 Width tolerances shall be in agreement with table 2.

These tolerances are all plus.

**5.2.2** Width tolerances may be chosen by agreement between purchaser and supplier :

- for sheets of thickness over 160 mm;
- for sheets of width equal to or less than 500 mm and for sheets of width over 3 500 mm.

**5.2.3** Two classes of tolerance are specified. Class 2 tolerances may be applied, for instance, to sheared sheet or hot-rolled material as specified in some national standards.

**5.2.4** Table 2 is based on guillotine shearing or sawing to size. When other techniques are practical, closer tolerances may be agreed between the purchaser and the supplier.

### 5.3 Length tolerances

**5.3.1** Length tolerances shall be in agreement with table 3 for lengths up to and including 15 000 mm.

These tolerances are all plus.

**5.3.2** Tolerances may be chosen by agreement between purchaser and supplier for thicknesses over 160 mm.

**5.3.3** Table 3 is based on guillotine shearing or sawing to size. Where other techniques are practical, closer tolerances may be agreed between the purchaser and the supplier.

## 6 Shape tolerances

### 6.1 Lateral curvature tolerances

When tested with the sheet resting on a flat surface, against a straight edge, the lateral curvature  $d$  shall not exceed the appropriate value given in table 4.

### 6.2 Flatness tolerances

**6.2.1** Flatness is tested with the sheet resting on a flat horizontal surface with the concave side opposite to the surface.

Deviation from flatness  $d$ , resulting from arching, buckling or edge waves, is measured as shown in figures 1 to 4, using a lightweight straight edge and a suitable measuring device such as a feeler gauge, dial gauge or scale.

**6.2.2** Deviation from flatness shall not exceed the appropriate  $d$  value in table 5.

**6.2.3** Two classes of tolerance are specified for thicknesses over 0,20 mm and up to and including 16 mm. Class 1 may be applied for alloys of category A, and class 2 for alloys of category B.

The class chosen by the purchaser shall be indicated on the order.

**6.2.4** This clause is not applicable to annealed (O) or hard temper (HX8 and over) or as fabricated (F) material.

### 6.3 Squareness tolerances

**6.3.1** The diagonal distances between opposite corners of any sheet shall not differ by more than the values shown in table 6.

**6.3.2** Two classes of tolerance are specified. Class 2 may be used, for instance, for hot-rolled material, as specified in some national standards.

STANDARD PREVIEW  
(standards.iteh.ai)  
ISO 6361-4:1988  
<https://standards.iteh.ai/catalog/standards/sist/bb8ba299-9393-48ad-8077-853d2207b60/iso-6361-4-1988>

Table 1 — Thickness tolerances (plus and minus)

Values in millimetres

Over	Specified thickness	Specified width																			
		Over 500 <sup>1)</sup> up to and including 1 000				Over 1 000 up to and including 1 500				Over 1 500 up to and including 2 000				Over 2 000 up to and including 2 500				Over 2 500 up to and including 3 000 <sup>2)</sup>			
		Class 1		Class 2 <sup>3)</sup>		Class 1		Class 2 <sup>3)</sup>		Class 1		Class 2 <sup>3)</sup>		Class 1		Class 2 <sup>3)</sup>		Class 1		Class 2 <sup>3)</sup>	
Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B	Category A	Category B		
0,20 <sup>4)</sup>	0,25	0,03	0,04	0,04	0,05	0,06	0,08	0,08	0,09	0,10	0,12	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	
0,25	0,40	0,04	0,05	0,05	0,07	0,08	0,10	0,10	0,11	0,12	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	0,42	
0,40	0,63	0,04	0,05	0,05	0,07	0,08	0,10	0,10	0,11	0,12	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	0,42	
0,63	0,80	0,05	0,06	0,06	0,08	0,09	0,10	0,10	0,11	0,12	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	0,42	
0,80	1,00	0,06	0,07	0,07	0,09	0,10	0,12	0,12	0,13	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	0,42	0,46	
1,00	1,20	0,07	0,08	0,08	0,10	0,11	0,12	0,12	0,13	0,14	0,16	0,18	0,20	0,22	0,26	0,30	0,34	0,38	0,42	0,46	
1,20	1,60	0,08	0,09	0,09	0,11	0,12	0,14	0,14	0,15	0,16	0,18	0,20	0,22	0,24	0,26	0,30	0,34	0,38	0,42	0,46	
1,60	2,00	0,09	0,10	0,10	0,12	0,13	0,15	0,15	0,16	0,17	0,19	0,21	0,23	0,25	0,27	0,30	0,34	0,38	0,42	0,46	
2,00	2,50	0,10	0,11	0,11	0,13	0,14	0,16	0,16	0,17	0,18	0,20	0,22	0,24	0,26	0,28	0,30	0,34	0,38	0,42	0,46	
2,50	3,20	0,12	0,13	0,13	0,15	0,16	0,18	0,18	0,19	0,20	0,22	0,24	0,26	0,28	0,30	0,32	0,36	0,40	0,44	0,48	
3,20	4,00	0,14	0,15	0,15	0,17	0,18	0,20	0,20	0,21	0,22	0,24	0,26	0,28	0,30	0,32	0,36	0,40	0,44	0,48	0,52	
4,00	5,00	0,18	0,19	0,19	0,21	0,22	0,24	0,24	0,25	0,26	0,28	0,30	0,32	0,34	0,36	0,40	0,44	0,48	0,52	0,56	
5,00	6,30	0,24	0,25	0,25	0,27	0,28	0,30	0,30	0,31	0,32	0,34	0,36	0,38	0,40	0,42	0,46	0,50	0,54	0,58	0,62	
6,30	8	0,32	0,33	0,33	0,35	0,36	0,38	0,38	0,39	0,40	0,42	0,44	0,46	0,48	0,50	0,54	0,58	0,62	0,66	0,70	
8	10	0,45	0,46	0,46	0,48	0,49	0,50	0,50	0,51	0,52	0,54	0,56	0,58	0,60	0,62	0,66	0,70	0,74	0,78	0,82	
10	16	0,50	0,52	0,52	0,54	0,55	0,56	0,56	0,57	0,58	0,60	0,62	0,64	0,66	0,68	0,72	0,76	0,80	0,84	0,88	
16	25	0,60	0,62	0,62	0,64	0,65	0,66	0,66	0,67	0,68	0,70	0,72	0,74	0,76	0,78	0,82	0,86	0,90	0,94	0,98	
25	40	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
40	60	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	
60	80	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	
80	100	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	
100	160	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	3,40	

1) Tolerances for widths up to and including 500 mm may be chosen by agreement between the purchaser and supplier.

2) Tolerances for widths over 3 000 mm may be chosen by agreement between purchaser and supplier.

3) Class 2 may be applied, for instance, to hot-rolled metal, as specified in some national standards.

4) Same tolerances for thicknesses over 0,15 mm and up to and including 0,20 mm by agreement between purchaser and supplier.

Table 2 – Width tolerances<sup>1)</sup> (all plus<sup>2)</sup>)

Values in millimetres

Specified thickness <sup>3)</sup>		Specified width <sup>3)</sup>							
Over	Up to and including	Over 500 up to and including 1 000		Over 1 000 up to and including 2 000		Over 2 000 up to and including 3 000		Over 3 000 up to and including 3 500	
		Class 1	Class 2 <sup>4)</sup>	Class 1	Class 2 <sup>4)</sup>	Class 1	Class 2 <sup>4)</sup>	Class 1	Class 2 <sup>4)</sup>
0,20 <sup>5)</sup>	3,20	6	6	6	6	8	8	8	9
3,20	6,30	6	6	6	7	8	9	8	10
6,30	12,50	6	8	7	9	9	11	10	12
12,50	50	6	10	7	10	9	12	10	14
50	160	6	—	7	—	9	—	10	—

- 1) Closer tolerances can be applied by agreement between the purchaser and supplier.
- 2) Tolerances may be all plus values as shown, or symmetrical plus and minus, half of values shown, by agreement between purchaser and supplier.
- 3) Tolerances may be chosen by agreement between purchaser and supplier :
  - for widths up to and including 500 mm and for widths over 3 500 mm;
  - for thicknesses up to and including 0,20 mm and for thicknesses over 160 mm.
- 4) Class 2 tolerances may be applied, for instance, to sheared sheets or hot-rolled metal as specified in some national standards.
- 5) Same tolerances for thicknesses over 0,15 mm and up to and including 0,20 mm by agreement between purchaser and supplier.

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

Table 3 – Length tolerances (all plus<sup>1)</sup>)

ISO 6361-4:1988

Values in millimetres

Specified thickness		Specified length							
Over	Up to and including	Up to and including 1 000	Over 1 000 up to and including 2 000	Over 2 000 up to and including 3 000	Over 3 000 up to and including 5 000	Over 5 000 up to and including 7 500	Over 7 500 up to and including 10 000	Over 10 000 up to and including 12 500	Over 12 500 up to and including 15 000
		0,20 <sup>2)</sup>	3,20	6	6	8	10	12	14
3,20	6,30	6	6	8	10	12	14	16	18
6,30	50	6	8	10	12	15	16	17	18
50	160	10	12	14	16	20	25	30	32

- 1) Tolerances may be all plus values as shown, or symmetrical plus and minus, half of values shown, by agreement between purchaser and supplier.
- 2) Same tolerances for thicknesses over 0,15 mm and up to and including 0,20 mm by agreement between purchaser and supplier.

**Table 4 – Lateral curvature tolerances – Maximum allowable deviation  $d$  from a straight edge**

Values in millimetres

Specified width <sup>1)</sup>		Specified length $L$					
Over	Up to and including	Up to and including 1 000	Over 1 000 up to and including 2 000	Over 2 000 up to and including 3 000	Over 3 000 up to and including 5 000	Over 5 000 up to and including 7 500	Over 7 500 up to and including 15 000
	100	3	11	25	2)	2)	2)
100	300	3	6	10			
300	700	2	4	6			
700	1 000	2	4	0,2 % $L$	0,2 % $L$	0,2 % $L$	0,2 % $L$
1 000	1 500	2)	3				
1 500	2 000		3				
2 000	3 500		2)				

1) For thicknesses over 6,30 mm and up to and including 160 mm, the tolerances shall be chosen by agreement between purchaser and supplier for widths up to and including 250 mm.

2) Tolerances chosen by agreement between purchaser and supplier.

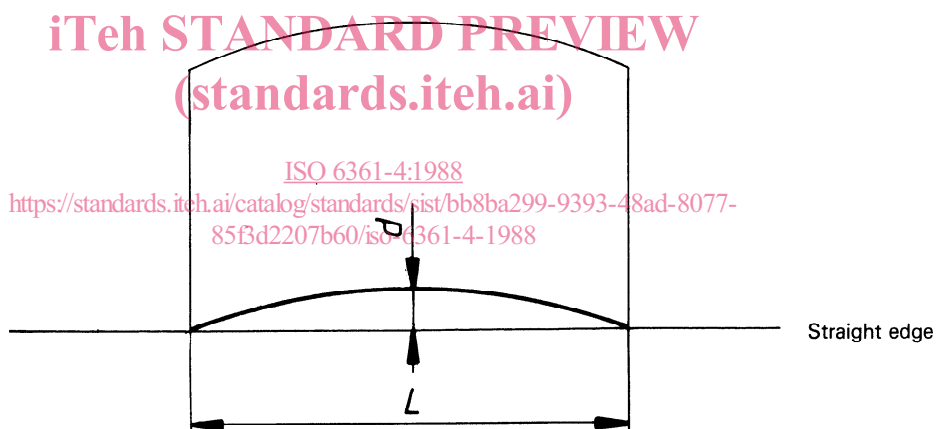


Table 5 — Flatness tolerances<sup>1)</sup> — Maximum allowable deviation  $d$ <sup>2)</sup>

Values in millimetres

Specified thickness		Wave length									
Over	Up to and including	Up to and including 500		Over 500 up to and including 1 000		Over 1 000 up to and including 1 500		Over 1 500 up to and including 2 000		Over 2 000	
		Class 1 <sup>3)</sup>	Class 2 <sup>3)</sup>	Class 1 <sup>3)</sup>	Class 2 <sup>3)</sup>	Class 1 <sup>3)</sup>	Class 2 <sup>3)</sup>	Class 1 <sup>3)</sup>	Class 2 <sup>3)</sup>	Class 1 <sup>3)</sup>	Class 2 <sup>3)</sup>
0,20 <sup>4)</sup>	3,20	2	4	4	6	6	9	8	11	5)	
3,20	6,30	3	5	5	7	8	10	10	12	0,8 % $L$	
6,30	16	4	5	7	7	8	10	10	13	0,7 % $L$	
16	40	4		6		8		10		0,6 % $L$	
40	80	—		5		7,5		9		0,5 % $L$	
80	160	—		4		6		8		0,4 % $L$	

1) These tolerances are not applicable in the following cases :

- cut-length sheets;
- O, F and HX8 and harder tempers;
- end or corner turn-up.

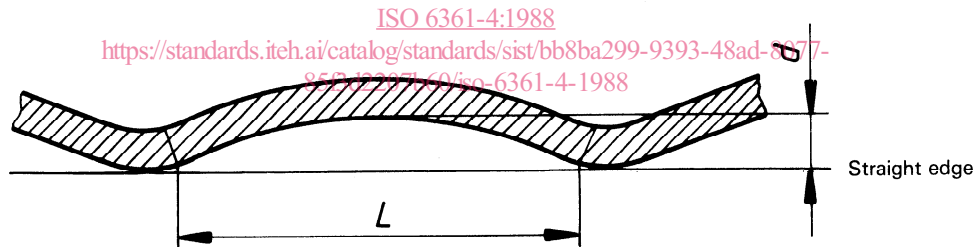
2) For an area of unflatness which extends over less than the width or the length of the sheet (i.e. buckle, short wave, edge wave), the deviation  $d$  should not exceed 1 % of the wave or buckle length. In any case, the tolerance shown in table 5 should not be exceeded.

3) Class 1 may be applied to alloys in category A, and class 2 to alloys in category B.

4) Same tolerances for thicknesses over 0,15 mm and up to and including 0,20 mm by agreement between purchaser and supplier.

5) Tolerances chosen by agreement between purchaser and supplier.

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)





**Table 6 – Squareness tolerances – Maximum values of the difference in length of the diagonals AA and BB**

Values in millimetres

Specified length		Specified thickness	Class 1				Class 2 <sup>1)</sup>		
Over	Up to and including		Specified width				Specified width		
			Up to and including 1 000	Over 1 000 up to and including 1 500	Over 1 500 up to and including 2 000	Over 2 000 up to and including 3 500	Over 1 000 up to and including 1 500	Over 1 500 up to and including 2 000	Over 2 000 up to and including 3 500
	1 000	≤ 6,30	4						
		> 6,30	5						
1 000	2 000	≤ 6,30	4	5	6		11	14	
		> 6,30	6	7	8				
2 000	3 000	≤ 6,30	5	5	7	8	11	14	25
		> 6,30	7	7	9	10			
3 000	3 500	≤ 6,30	6	6	7	8	11	14	25
		> 6,30	7	8	10	10			
3 500	5 000	≤ 6,30	6	8	8	10	15	20	30
		> 6,30	8	10	10	12			
5 000			2)	2)	2)	2)	2)	2)	2)

1) In some countries, class 2 may be used for hot-rolled sheet for instance.

2) Tolerances may be chosen by agreement between purchaser and supplier.

iteh STANDARD PREVIEW  
(standards.iteh.ai)

