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

**Part 2:
Mechanical properties**

*Aluminium et alliages d'aluminium corroyés — Barres, tubes et
profils filés —
Partie 2. Caractéristiques mécaniques*

ISO 6362-2:2012

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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 6362-2 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 6362-2:1990), which has been technically revised.

ISO 6362 consists of the following parts, under the general title *Wrought aluminium and aluminium alloys — Extruded rods/bars, tubes and profiles*:

- Part 1: *Technical conditions for inspection and delivery*
- Part 2: *Mechanical properties*
- Part 3: *Extruded rectangular bars — Tolerances on shape and dimensions*
- Part 4: *Profiles — Tolerances on shape and dimensions*
- Part 5: *Round, square and hexagonal bars — Tolerances on shape and dimensions*
- Part 6: *Round, square, rectangular and hexagonal tubes — Tolerances on shape and dimensions*
- Part 7: *Chemical composition*

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

Part 2: Mechanical properties

1 Scope

This part of ISO 6362 specifies the mechanical properties of wrought aluminium and aluminium alloy extruded rods/bars, tubes and profiles for general engineering applications.

It applies to extruded products.

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 6362-1, *Wrought aluminium and aluminium alloys — Extruded rods/bars, tubes and profiles — Part 1: Technical conditions for inspection and delivery*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ASTM B557M, *Standard Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6362-1 apply.

4 Tensile testing

For the selection of the specimens and tensile testing, see ISO 6892-1 or ASTM B557M.

5 Mechanical properties

Values for mechanical properties of aluminium and aluminium alloys are given in Tables 1 to 3.

For elongation two different gauge lengths are used. The choice of the gauge length for elongation measurements (A or $A_{50\text{mm}}$) is at the discretion of the producer, unless otherwise agreed.

NOTE A is the percentage elongation on a gauge length of $5,65\sqrt{S_0}$. $A_{50\text{mm}}$ is the percentage elongation on a gauge length of 50 mm.

Test results shall be rounded in accordance with the rules given in Annex A.

Table 1 — Mechanical properties of rods/bars

Alloy	Temper	Dimensions ^a	Tensile strength <i>R_m</i> MPa		0,2 % proof stress <i>R_{p0,2}</i> MPa		Elongation min.		
			min.	max.	min.	max.	<i>A</i> %	<i>A</i> _{50mm} %	
1070	H112	All	55	-	15	-	-	-	
1070A	H112	All	60	-	20	-	25	23	
1060	H112	3 ≤ <i>D</i> or <i>S</i> ≤ 30	60	-	30	-	-	25	
1050	H112	All	65	-	20	-	-	-	
1050A	H112	<i>D</i> < 35 or <i>S</i> < 30	65	-	20	-	25	23	
	O H111	All	60	95	20	-	25	23	
1350 ^b	H112	All	60	-	-	-	25	23	
1100	H112	<i>D</i> < 35 or <i>S</i> < 30	75	-	20	-	18	18	
		35 ≤ <i>D</i> or 30 ≤ <i>S</i>	75	-	20	-	-	-	
1200	H112	<i>D</i> < 35 or <i>S</i> < 30	75	-	25	-	20	18	
		35 ≤ <i>D</i> or 30 ≤ <i>S</i>	75	-	20	-	-	-	
2007	T4	<i>D</i> or <i>S</i> ≤ 80	370	-	250	-	8	6	
	T4510	80 < <i>D</i> or <i>S</i> ≤ 200	340	-	220	-	8	-	
	T4511	200 < <i>D</i> or <i>S</i> ≤ 250	330	-	210	-	7	-	
2011	T3	3 ≤ <i>D</i> or <i>S</i> ≤ 40	310	-	260	-	10	10	
		40 < <i>D</i> or <i>S</i> ≤ 50	295	-	235	-	10	12	
		50 < <i>D</i> or <i>S</i> ≤ 75	290	-	205	-	10	14	
	T4	3 ≤ <i>D</i> or <i>S</i> ≤ 200	275	-	125	-	14	16	
	T6	3 < <i>D</i> or <i>S</i> ≤ 75	310	-	230	-	8	10	
		75 < <i>D</i> or <i>S</i> ≤ 160	295	-	195	-	6	8	
2011A	T4	<i>D</i> ≤ 200, <i>S</i> ≤ 60	275	-	125	-	14	12	
	T6	<i>D</i> ≤ 75, <i>S</i> ≤ 60	310	-	230	-	8	6	
		75 < <i>D</i> ≤ 200	295	-	195	-	6	-	
2014	O ^c	All	-	250	-	135	10	12	
	T4	All	345	-	240	-	10	12	
	T4510								
	T4511								
	T42 ^d	All	345	-	205	-	-	12	
	T6	T6510 T6511	<i>D</i> or <i>S</i> ≤ 12	410	-	365	-	-	7
			12 < <i>D</i> or <i>S</i> ≤ 19	440	-	400	-	6	7
			19 < <i>D</i> or <i>S</i> , <i>A</i> ≤ 16 000	470	-	410	-	6	7
			19 < <i>D</i> or <i>S</i> , 16 000 < <i>A</i> ≤ 20 000	470	-	400	-	6	6
			19 < <i>D</i> or <i>S</i> , 20 000 < <i>A</i> ≤ 25 000	450	-	380	-	6	6
19 < <i>D</i> or <i>S</i> , 25 000 < <i>A</i> ≤ 30 000			430	-	365	-	6	6	
T62 ^e		<i>D</i> or <i>S</i> ≤ 19	410	-	365	-	-	7	
		19 < <i>D</i> or <i>S</i> , <i>A</i> ≤ 16 000	410	-	365	-	-	7	
		19 < <i>D</i> or <i>S</i> , 16 000 < <i>A</i> ≤ 20 000	410	-	365	-	-	6	

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength R_m MPa		0,2 % proof stress $R_{p0,2}$ MPa		Elongation min.	
			min.	max.	min.	max.	A %	A_{50mm} %
2014A	O	$10 < D$ or $S \leq 200$	-	250	-	135	10	12
	T4, T4510 T4511	$10 < D$ or $S \leq 200$	345	-	240	-	10	12
	T6	$12,5 < D$ or $S \leq 100$	440	-	400	-	6	-
	T6510	$100 < D$ or $S \leq 120$	430	-	350	-	6	-
	T6511	$120 < D$ or $S \leq 200$	430	-	350	-	6	-
	2017	O ^c	All	-	245	-	125	-
T4		$A \leq 70\ 000$	345	-	215	-	-	12
T42 ^d		$70\ 000 < A \leq 100\ 000$	345	-	195	-	-	12
2017A	O	$10 < D$ or $S \leq 100$	-	250	-	150	10	-
	T4	$10 < D$ or $S \leq 80$	390	-	265	-	10	-
	T4510	$80 < D$ or $S \leq 200$	360	-	220	-	7	-
	T4511							
2024	O ^c	All		245	-	125	10	12
	T3510 T3511	D or $S \leq 6$	390	-	295	-	-	12
		$6 < D$ or $S \leq 19$	410	-	300	-	10	12
		$19 < D$ or $S \leq 38$	450	-	310	-	8	10
		$38 < D$ or S , $A \leq 16\ 000$	480	-	365	-	7	10
		$38 < D$ or S , $16\ 000 < A \leq 20\ 000$	470	-	335	-	7	8
	T3 T4	D or $S \leq 6$	390	-	295	-	-	12
		$6 < D$ or $S \leq 19$	410	-	305	-	-	12
		$19 < D$ or $S \leq 38$	450	-	315	-	-	10
		$38 < D$ or S , $A \leq 16\ 000$	480	-	365	-	8	10
		$38 < D$ or $S \leq 100$, $16\ 000 < A \leq 20\ 000$	470	-	335	-	8	8
		$38 < D$ or $S \leq 100$, $20\ 000 < A \leq 30\ 000$	460	-	315	-	8	8
		$100 < D$ or $S \leq 200$, $A \leq 16\ 000$	480	-	365	-	6	10
	$100 < D$ or $S \leq 200$, $16\ 000 < A \leq 20\ 000$	470	-	335	-	6	8	
	$100 < D$ or $S \leq 200$, $20\ 000 < A \leq 30\ 000$	460	-	315	-	6	8	
	T42 ^d	D or $S \leq 19$	390	-	265	-	-	12
		$19 < D$ or $S \leq 38$	390	-	265	-	-	10
		$38 < D$ or S , $A \leq 16\ 000$	390	-	265	-	-	10
		$38 < D$ or S , $16\ 000 < A \leq 20\ 000$	390	-	265	-	-	8
	T8510 T8511 T81	$10 < D$ or $S \leq 150$	455	-	400	-	4	-

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength R_m MPa		0,2 % proof stress $R_{p0,2}$ MPa		Elongation min.	
			min.	max.	min.	max.	A %	A_{50mm} %
2030	T4	D or $S \leq 80$	370	-	250	-	8	6
	T4510	$80 < D$ or $S \leq 200$	340	-	220	-	8	-
	T4511	$200 < D$ or $S \leq 250$	330	-	210	-	7	-
3102	H112	All	80	-	30	-	25	23
3003	H112	All	95	-	35	-	-	-
	O H111	All	95	135	35	-	25	20
3103	H112	All	95	-	35	-	25	20
	O H111	All	95	135	35	-	25	20
5005 5005A	H112	All	100	-	40	-	18	16
	O H111	$D \leq 80, S \leq 60$	100	150	40	-	18	16
5019	H112	D or $S \leq 200$	250	-	110	-	14	12
	O H111	D or $S \leq 200$	250	320	110	-	15	13
5049	H112	All	180	-	80	-	15	13
5051A	H112	All	150	-	50	-	16	14
	O H111	All	150	200	50	-	18	16
5251	H112	All	160	-	60	-	16	14
	O H111	All	160	220	60	-	17	15
5052	H112	All	175	-	70	-	-	-
	O	All	175	245	70	-	-	20
5154A	H112	D or $S \leq 200$	200	-	85	-	16	14
	O H111	D or $S \leq 200$	200	275	85	-	18	16
5454	H112	All	215	-	100	-	-	12
	O H111	D or $S \leq 200$	200	275	85	-	18	16
5754	H112	D or $S \leq 150$ $150 < D$ or $S \leq 250$	180 180	- -	80 70	- -	14 13	12 -
	O H111	D or $S \leq 150$	180	250	80	-	17	15
5056	H112	$A \leq 30\ 000$	245	-	100	-	-	-
		$30\ 000 < A \leq 70\ 000$	225	-	80	-	-	-
		$70\ 000 < A \leq 100\ 000$	215	-	70	-	-	-

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength R_m MPa		0,2 % proof stress $R_{p0,2}$ MPa		Elongation min.	
			min.	max.	min.	max.	A %	A_{50mm} %
5083	H112	D or $S \leq 130$, $A \leq 20\ 000$	275	-	140	-	12	12
	O	D or $S \leq 130$, $A \leq 20\ 000$	275	355	110	-	-	14
5086	H112	D or $S \leq 250$	240	-	95	-	12	10
	O	D or $S \leq 200$	240	320	95	-	18	15
6101	T6 ^f	$3 \leq D$ or $S \leq 7$	195	-	165	-	-	10
		$7 < D$ or $S \leq 17$	195	-	165	-	-	12
		$17 < D$ or $S \leq 30$	175	-	145	-	-	14
	T7	$3 \leq D$ or $S \leq 17$	135	-	110	-	-	10
6101A	T6 ^f	D or $S \leq 150$	200	-	170	-	10	8
6101B	T6 ^{f,g}	$S \leq 15$	215	-	160	-	8	6
	T7 ^{f,h}	$S \leq 15$	170	-	120	-	12	10
6005 6005A	T6 ^f	D or $S \leq 25$	270	-	225	-	10	8
		$25 < D$ or $S \leq 50$	270	-	225	-	8	-
		$50 < D$ or $S \leq 100$	260	-	215	-	8	-
6005C	T5	D or $S \leq 6$	245	-	205	-	-	8
		$6 < D$ or $S \leq 12$	225	-	175	-	-	8
	T6 ^f	D or $S \leq 60$	265	-	235	-	-	8
6110A	T5 ^f	D or $S \leq 120$	380	-	360	-	10	8
	T6 ^f	$D \leq 120$ or $S \leq 150$	410	-	380	-	10	8
6012	T6 ^f	D or $S \leq 150$	310	-	260	-	8	6
	T6510 ^f	$150 < D$ or $S \leq 200$	260	-	200	-	8	-
	T6511 ^f							
6018	T6 ^f	D or $S \leq 150$	310	-	260	-	8	6
	T6510 ^f	$150 < D$ or $S \leq 200$	260	-	200	-	8	-
	T6511 ^f							
6023	T6 ^f	D or $S \leq 150$	320	-	270	-	10	8
	T6510 ^f							
	T6511 ^f							
6351	O	D or $S \leq 200$	-	160	-	110	14	12
	H111							
	T4 ^f	D or $S \leq 200$	205	-	110	-	14	12
	T6 ^f	D or $S \leq 20$	295	-	250	-	8	6
		$20 < D$ or $S \leq 75$	300	-	255	-	8	-
		$75 < D$ or $S \leq 150$	310	-	260	-	8	-
$150 < D$ or $S \leq 200$		280	-	240	-	6	-	
$200 < D$ or $S \leq 250$	270	-	200	-	6	-		

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength <i>R_m</i> MPa		0,2 % proof stress <i>R_{p0,2}</i> MPa		Elongation min.	
			min.	max.	min.	max.	<i>A</i> %	<i>A</i> _{50mm} %
6060	T4 ^f	D or $S \leq 150$	120	-	60	-	16	14
	T5	D or $S \leq 150$	160	-	120	-	8	6
	T6 ^f	D or $S \leq 100$	190	-	150	-	10	8
	T64 ^f	D or $S \leq 50$	180	-	120	-	12	10
	T66 ^f	D or $S \leq 150$	215	-	160	-	8	6
6360	T4 ^f	D or $S \leq 150$	110	-	50	-	16	14
	T5	D or $S \leq 150$	150	-	110	-	8	6
	T6 ^f	D or $S \leq 150$	185	-	140	-	8	6
	T66 ^f	D or $S \leq 150$	195	-	150	-	8	6
6061	O ^c	All	-	145	-	110	-	16
	T4 ^f T4511	All	180	-	110	-	14	16
	T42 ^d	All	175	-	85	-	-	16
	T6 ^f T62 ^e	D or $S \leq 6$	260	-	240	-	7	8
	T6511	$6 < D$ or S	260	-	240	-	9	10
6261	O H111	D or $S \leq 100$	170	-	120	-	14	12
	T4 ^f	D or $S \leq 100$	180	-	100	-	14	12
	T6 ^f	D or $S \leq 20$ $20 < D$ or $S \leq 100$	290 290	- -	245 245	- -	8 8	7 -
6262	T6 ^f	D or $S \leq 200$	260	-	240	-	10	8
6262A	T6 ^f	$D \leq 220$ or $S \leq 155$	260	-	240	-	10	8
6063	O H111	D or $S \leq 200$	-	130	-	-	18	16
	T1	D or $S \leq 12$	120	-	60	-	-	12
		$12 < D$ or $S \leq 25$	110	-	55	-	-	12
	T4 ^f	D or $S \leq 150$	130	-	65	-	14	12
		$150 < D$ or $S \leq 200$	120	-	65	-	12	-
	T5	D or $S \leq 12$	150	-	110	-	7	8
		$12 < D$ or $S \leq 25$	145	-	105	-	7	8
T6 ^f	D or $S \leq 3$	205	-	170	-	-	8	
	$3 < D$ or $S \leq 25$	205	-	170	-	9	10	
T66 ^f	D or $S \leq 200$	245	-	200	-	10	8	

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength R_m MPa		0,2 % proof stress $R_{p0,2}$ MPa		Elongation min.	
			min.	max.	min.	max.	A %	A_{50mm} %
6063A	O H111	D or $S \leq 200$	-	150	-	-	16	14
	T4 ^f	D or $S \leq 150$	150	-	90	-	12	10
		$150 < D$ or $S \leq 200$	140	-	90	-	10	-
	T6 ^f	D or $S \leq 200$	200	-	160	-	7	5
D or $S \leq 150$ $150 < D$ or $S \leq 200$		230 220	- -	190 160	- -	7 7	5 -	
6463	T4 ^f	D or $S \leq 150$	125	-	75	-	14	12
	T5	D or $S \leq 150$	150	-	110	-	8	6
	T6 ^f	D or $S \leq 150$	195	-	160	-	10	8
6065	T6 ^f	$D \leq 220$ or $S \leq 155$	260	-	240	-	10	8
6081	T6 ^f	D or $S \leq 250$	275	-	240	-	8	6
6082	O H111	D or $S \leq 200$	-	160	-	110	14	12
	T4 ^f	$10 \leq D$ or $S \leq 80$	205	-	110	-	14	14
	T6 ^f	$10 \leq D \leq 60$ or $10 \leq S \leq 50$	310	-	260	-	8	7
$60 < D \leq 150$ or $50 < S \leq 150$		300	-	240	-	8	-	
6182	T4 ^f	$D \leq 220$ or $S \leq 155$	205	-	110	-	12	10
	T6 ^{f,i}	$9 < D$ or $S \leq 100$	360	-	330	-	9	7
		$100 < D$ or $S \leq 150$	330	-	300	-	8	6
		$150 < D$ or $S \leq 220$	280	-	240	-	6	4
7003	T5	D or $S \leq 12$	285	-	245	-	-	10
		$12 < D$ or $S \leq 25$	275	-	235	-	-	10
	T6 ^f	D or $S \leq 50$ $50 < D$ or $S \leq 150$	350 340	- -	290 280	- -	10 10	8 8
7204	O	All	-	245	-	145	-	12
	T4 ^j	All	315	-	195	-	-	11
	T6	All	335	-	275	-	-	-
7005	T6 ^f	D or $S \leq 50$	350	-	290	-	10	8
		$50 < D$ or $S \leq 200$	340	-	270	-	10	-
7108	T6 ^f	D or $S \leq 100$	310	-	260	-	10	8
7108A	T6 ^f	D or $S \leq 200$	310	-	260	-	12	10
	T66 ^f	D or $S \leq 50$	350	-	290	-	10	8
$50 < D$ or $S \leq 200$		340	-	275	-	10	-	
7020	T6 ^f	D or $S \leq 50$	350	-	290	-	10	8
		$50 < D$ or $S \leq 200$	340	-	275	-	10	-
7021	T6 ^f	D or $S \leq 40$	410	-	350	-	10	8

Table 1 (continued)

Alloy	Temper	Dimensions ^a	Tensile strength <i>R_m</i> MPa		0,2 % proof stress <i>R_{p0,2}</i> MPa		Elongation min.	
			min.	max.	min.	max.	<i>A</i> %	<i>A</i> _{50mm} %
7022	T6 ^f	D or $S \leq 80$	490	-	420	-	7	5
	T6510 ^f	$80 < D$ or $S \leq 200$	470	-	400	-	7	-
	T6511 ^f							
7049A	T6	D or $S \leq 100$	610	-	530	-	5	4
	T6510	$100 < D$ or $S \leq 125$	560	-	500	-	5	-
	T6511	$125 < D$ or $S \leq 150$	520	-	430	-	5	-
		$150 < D$ or $S \leq 180$	450	-	400	-	3	-
7050	T73511	D or $S \leq 125$, $A \leq 20\ 000$	485	-	415	-	7	8
	T74511	D or $S \leq 76$	505	-	435	-	-	7
	T76510	D or $S \leq 127$	545	-	475	-	-	7
7075	O ^c	$A \leq 20\ 000$	-	275	-	165	9	10
	T6, T62 ^e T6510 T6511	D or $S \leq 6$	540	-	480	-	-	7
		$6 \leq D$ or $S \leq 75$	560	-	500	-	6	7
		$75 < D$ or $S \leq 110$, $A \leq 13\ 000$	560	-	490	-	5	7
		$75 < D$ or $S \leq 110$, $13\ 000 < A \leq 20\ 000$	540	-	480	-	5	7
		$110 < D$ or $S \leq 130$, $A \leq 13\ 000$	540	-	470	-	5	6
	T73 ^k	$130 < D$ or $S \leq 150$	500	-	440	-	5	-
		$10 < D$ or $S \leq 25$	485	-	420	-	7	-
		$25 < D$ or $S \leq 50$	475	-	405	-	7	-
		$50 < D$ or $S \leq 70$	475	-	405	-	7	-
$70 < D$ or $S \leq 100$		470	-	390	-	6	-	
T73510 ^k T73511 ^k	D or $S \leq 25$	485	-	420	-	7	5	
	$25 < D$ or $S \leq 75$	475	-	405	-	7	-	
	$75 < D$ or $S \leq 100$	470	-	390	-	6	-	
	$100 < D$ or $S \leq 150$	440	-	360	-	6	-	