BS EN 755-2:2016

BSI Standards Publication

Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles

Part 2: Mechanical properties

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National foreword

This British Standard is the UK implementation of EN 755-2:2016. It supersedes BS EN 755-2:2013 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee NFE/35, Light metals and their alloys.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties

Aluminium et alliages d'aluminium - Barres, tubes et profilés filés - Partie 2 : Caractéristiques mécaniques

Aluminium und Aluminiumlegierungen - Stranggepresste Stangen, Rohre und Profile - Teil 2: Mechanische Eigenschaften

This European Standard was approved by CEN on 10 January 2016.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 755-2:2016) has been prepared by Technical Committee CEN/TC 132 “Aluminium and aluminium alloys”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 755-2:2013.

CEN/TC 132 decided to revise EN 755-2:2013 as follows:

— reorganization of the list of the tables of mechanical properties of the relevant aluminium and aluminium alloys;

— addition of the alloy EN AW-2618A [AlCu2Mg1,5Ni] in a new Table 9;

— correction of the alloy EN AW-6026 [Al MgSiBi] in a new Table 36;

— addition of the alloy EN AW-6056 [Al Si1MgCuMn] in a new Table 38.

— Modification of the Alloy EN AW-6060 [Al MgSi] in Table 39: Extruded profile T6 and T66 wall thickness-border from 3 mm to 5 mm;

— Modification of the Alloy EN AW-6063 [Al Mg0,7Si] in Table 45: Extruded profile T5 wall thickness-border from 3 mm to 10 mm;

— The former Table 26 was moved, and is now Table 48.

EN 755, *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles* comprises the following parts:

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

— *Part 2: Mechanical properties*

— *Part 3: Round bars, tolerances on dimensions and form*

— *Part 4: Square bars, tolerances on dimensions and form*

— *Part 5: Rectangular bars, tolerances on dimensions and form*

— *Part 6: Hexagonal bars, tolerances on dimensions and form*

— *Part 7: Seamless tubes, tolerances on dimensions and form*

— *Part 8: Porthole tubes, tolerances on dimensions and form*

— *Part 9: Profiles, tolerances on dimensions and form*

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1 Scope

This European Standard specifies the mechanical property limits resulting from tensile testing applicable to aluminium and aluminium alloy extruded rod/bar, tube and profile.

Technical conditions for inspection and delivery, including product and testing requirements, are specified in EN 755-1. Temper designations are defined in EN 515. The chemical composition limits for these materials are given in EN 573-3.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 755-1, *Aluminium and aluminium alloys- Extruded rod/bar, tube and profiles - Part 1: Technical conditions for inspection and delivery*

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

3 Mechanical property limits

3.1 General

The mechanical properties shall be in conformity with those specified in Table 1 to Table 61 or those agreed upon between supplier and purchaser and stated in the order document.

Table 1 to Table 61 contain limits of mechanical property values obtained by tensile testing according to EN ISO 6892-1 after sampling and test piece preparation according to EN 755-1.

NOTE The mechanical properties refer to test pieces taken in the longitudinal direction. Mechanical properties of test pieces taken in other directions can differ from those for the longitudinal direction quoted in this standard.

Brinell hardness values given in Table 1 to Table 61 expressed as HBW values are for information only.

3.2 Elongation

If not otherwise agreed, the *A* value shall be used.

The *A* value for elongation is the % elongation measured over a gauge length of $5{,}65\sqrt{S_0}$ (where S_0 is the initial cross-sectional area of the test-piece), and expressed in percent.

For certain products the supplier may choose (if not otherwise specified in the order documents) to use the elongation based on A_{50mm}. Consequently, values for the A_{50mm} are included in the following tables.

The A_{50mm} value is the elongation measured over a gauge length of 50 mm and expressed in percent.

Test pieces and their location in the specimen are given in EN 755-1.

3.3 Reference list of the tables of mechanical properties of the relevant aluminium and aluminium alloys

3.4 Tables of mechanical properties

Table 1 — Aluminium EN AW-1050A [Al 99,5]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	60	-	20	-	25	23	20
O, H111	all	all	60	95	20	-	25	23	20
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min	
F [c], H112	all		60		20	-	25	23	20
O, H111	all		60	95	20	-	25	23	20
Extruded profile									
Temper	**Wall thickness** t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min	
F [c], H112	all		60		20	-	25	23	20

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 2 — Aluminium EN AW-1070A [Al 99,7]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	60	-	23		25	23	18
Extruded tube Not specified									
Extruded profile Not specified									

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 3 — Aluminium EN AW-1200 [Al 99,0]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	75	-	25	-	20	18	23
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	75	-	25		20	18	23
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		75	-	25		20	18	23

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 4 — Aluminium EN AW-1350 [Al 99,5]

Extruded rod/bar [d]									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	60	-	-	-	25	23	20
Extruded tube [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		60	-	-	-	25	23	20
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		60	-	-	-	25	23	20

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

[d] Electrical conductivity $\gamma \geq 35{,}4$ MS/m.

Table 5 — Alloy EN AW-2007 [Al Cu4PbMgMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4, T4510, T4511 [c]	≤ 80	≤ 80	370	-	250	-	8	6	95
	80 < D ≤ 200	80 < S ≤ 200	340	-	220	-	8	-	
	200 < D ≤ 250	200 < S ≤ 250	330	-	210	-	7	-	
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4, T4510, T4511 [c]	≤ 25		370	-	250	-	8	6	95
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4, T4510, T4511 [c]	≤ 30		370	-	250	-	8	6	95

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 6 — Alloy EN AW-2011 [Al Cu6BiPb] and Alloy EN AW-2011A [Al Cu6BiPb(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 200	≤ 60	275	-	125	-	14	12	95
T6 [c]	≤ 75	≤ 60	310	-	230	-	8	6	110
	75 < D ≤ 200	-	295	-	195	-	6	-	110
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		310	-	230	-	6	4	110
Extruded profile Not specified									

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 7 — Alloy EN AW-2014 [Al Cu4SiMg] and Alloy EN AW-2014A [Al Cu4SiMg(A)]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	250	-	135	12	10	45
T4, T4510, T4511	≤ 25	≤ 25	370	-	230	-	13	11	110
	25 < D ≤ 75	25 < S ≤ 75	410	-	270	-	12	-	110
	75 < D ≤ 150	75 < S ≤ 150	390	-	250	-	10	-	110
	150 < D ≤ 200	150 < S ≤ 200	350	-	230	-	8	-	110
T6, T6510, T6511	≤ 25	≤ 25	415	-	370	-	6	5	140
	25 < D ≤ 75	25 < S ≤ 75	460	-	415	-	7	-	140
	75 < D ≤ 150	75 < S ≤ 150	465	-	420	-	7	-	140
	150 < D ≤ 200	150 < S ≤ 200	430	-	350	-	6	-	140
	200 < D ≤ 250	200 < S ≤ 250	420	-	320	-	5	-	140

Extruded tube								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
O, H111	≤ 20	-	250	-	135	12	10	45
T4, T4510, T4511	≤ 20	370	-	230	-	11	10	110
T6, T6510, T6511	≤ 10	415	-	370	-	7	5	140
	10 < t ≤ 40	450	-	400	-	6	4	140

Extruded profile [c]								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
O, H111	all	-	250	-	135	12	10	45
T4, T4510, T4511	≤ 25	370	-	230	-	11	10	110
	25 < t ≤ 75	410	-	270	-	10	-	110
T6, T6510, T6511	≤ 25	415	-	370	-	7	5	140
	25 < t ≤ 75	460	-	415	-	7	-	

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] If a profile cross section comprises different thicknesses which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 8 — Alloy EN AW-2017A [Al Cu4MgSi(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	250	-	135	12	10	45
T4,T4510, T4511 [c]	≤ 25	≤ 25	380	-	260	-	12	10	105
	25 < D ≤ 75	25 < S ≤ 75	400	-	270	-	10	-	105
	75 < D ≤ 150	75 < S ≤ 150	390	-	260	-	9	-	105
	150 < D ≤ 200	150 < S ≤ 200	370	-	240	-	8	-	105
	200 < D ≤ 250	200 < S ≤ 250	360	-	220	-	7	-	105

Extruded tube								**Hardness** Typical value HBW
Temper	Wall thickness t mm	R_m MPa		$R_{p0.2}$ MPa		A %	$A_{50\,mm}$ %	
		min.	max.	min.	max.	min.	min.	
O, H111	≤ 20	-	250	-	135	12	10	45
T4, T4510, T4511 [c]	≤ 10	380	-	260	-	12	10	105
	10 < t ≤ 75	400	-	270	-	10	8	105

Extruded profile								**Hardness** Typical value HBW
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	
		min.	max.	min.	max.	min.	min.	
T4, T4510, T4511 [c]	≤ 30	380	-	260	-	10	8	105

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 9 — Alloy EN AW-2618A [Al Cu2Mg1.5Ni]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6511	$D \leq 10$	$S \leq 10$	410	-	330	-	6	4	140
T6, T6511	$10 < D \leq 100$	$10 < S \leq 100$	420	-	360	-	7	5	145
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6511	≤ 10		410	-	330	-	6	4	140
T6, T6511	$10 < t \leq 100$		420	-	360	-	7	5	145
Extruded profile [c]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6511	≤ 10		410	-	330	-	6	4	140
T6, T6511	$10 < t \leq 100$		420	-	360	-	7	5	145

[a] D = Diameter for round bar.

[b] Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 10 — Alloy EN AW-2024 [Al Cu4Mg1]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	250	-	150	12	10	47
T3, T3510, T3511	≤ 50	≤ 50	450	-	310	-	8	6	120
	50 < D ≤ 100	50 < S ≤ 100	440	-	300	-	8	-	120
	100 < D ≤ 200	100 < S ≤ 200	420	-	280	-	8	-	120
	200 < D ≤ 250	200 < S ≤ 250	400	-	270	-	8	-	120
T8, T8510, T8511	≤ 150	≤ 150	455	-	380	-	5	4	130
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 30		-	250	-	150	12	10	47
T3, T3510, T3511	≤ 30		420	-	290	-	8	6	120
T8, T8510, T8511	≤ 30		455	-	380	-	5	4	130
Extruded profile [c]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	all		-	250	-	150	12	10	47
T3, T3510, T3511	≤ 15		395	-	290	-	8	6	120
	15 < t ≤ 50		420	-	290	-	8	-	120
T8, T8510, T8511	≤ 50		455	-	380	-	5	4	130

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 11 — Alloy EN AW-2030 [Al Cu4PbMg]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.			
T4, T4510, T4511 [c]	≤ 80	≤ 80	370	-	250	-	8	6	115
	80 < D ≤ 200	80 < S ≤ 200	340	-	220	-	8	-	115
	200 < D ≤ 250	200 < S ≤ 250	330	-	210	-	7	-	115
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
T4, T4510, T4511 [c]	≤ 25		370	-	250	-	8	6	115
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
T4, T4510, T4511 [c]	≤ 30		370	-	250	-	8	6	115

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 12 — Alloy EN AW-3102 [Al Mn0,2]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.			
F [c], H112	all	all	80	-	30	-	25	23	23
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
F [c], H112	all		80	-	30	-	25	23	23
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
F [c], H112	all		80	-	30	-	25	23	23

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 13 — Alloy EN AW-3003 [Al Mn1Cu]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\,mm}$ % min.	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.			
F [c], H112	all	all	95	-	35	-	25	20	30
O, H111	all	all	95	135	35	-	25	20	30
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\,mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
F [c], H112	all		95	-	35	-	25	20	30
O, H111	all		95	135	35	-	25	20	30
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\,mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
F [c], H112	all		95	-	35	-	25	20	30

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 14 — Alloy EN AW-3103 [Al Mn1]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	95	-	35	-	25	20	28
O, H111	all	all	95	135	35	-	25	20	28
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		95	-	35	-	25	20	28
O, H111	all		95	135	35	-	25	20	28
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		95	-	35	-	25	20	28

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 15 — Alloy EN AW-5005 [Al Mg1(B)] and Alloy EN AW-5005A [Al Mg1(C)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	100	100	-	40	-	18	16	30
O, H111	≤ 80	≤ 60	100	150	40	-	18	16	30
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		100	-	40	-	18	16	30
O, H111	≤ 20		100	150	40	-	20	18	30
Extruded Profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		100	-	40	-	18	16	30
O, H111	≤ 20		100	150	40	-	20	18	30

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 16 — Alloy EN AW-5019 [Al Mg5]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 200	≤ 200	250	-	110	-	14	12	65
O, H111	≤ 200	≤ 200	250	320	110	-	15	13	65
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 30		250	-	110	-	14	12	65
O, H111	≤ 30		250	320	110	-	15	13	65
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 30		250	-	110	-	14	12	65

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 17 — Alloy EN AW-5049 [Al Mg2Mn0,8]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	180	-	80	-	15	13	50
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		180	-	80	-	15	13	50
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		180	-	80	-	15	13	50

[a] D = Diameter for round bar.
[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.
[c] F Temper: property values are for information only.

Table 18 — Alloy EN AW-5051A [Al Mg2]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	150	-	50	-	16	14	40
O, H111	all	all	150	200	50	-	18	16	40
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		150	-	60	-	16	14	40
O, H111	all		150	200	60	-	18	16	40
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		150	-	60	-	16	14	40

[a] D = Diameter for round bar.
[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.
[c] F Temper: property values are for information only.

Table 19 — Alloy EN AW-5251 [Al Mg2Mn0,3]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	all	all	160	-	60	-	16	14	45
O, H111	all	all	160	220	60	-	17	15	45
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		160	-	60	-	16	14	45
O, H111	all		160	220	60	-	17	15	45
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		160	-	60	-	16	14	45

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 20 — Alloy EN AW-5052 [Al Mg2,5]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F[c], H112	all	all	170	-	70	-	15	13	47
O, H111	all	all	170	230	70	-	17	15	45
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F[c], H112	all		170	-	70	-	15	13	47
O, H111	all		170	230	70	-	17	15	45
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F[c], H112	all		170	-	70	-	15	13	47

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 21 — Alloy EN AW-5154A [Al Mg3,5(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 200	≤ 200	200	-	85	-	16	14	55
O, H111	≤ 200	≤ 200	200	275	85	-	18	16	55
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		200	-	85	-	16	14	55
O, H111	≤ 25		200	275	85	-	18	16	55
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		200	-	85	-	16	14	55

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 22 — Alloy EN AW-5454 [Al Mg3Mn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 200	≤ 200	200	-	85	-	16	14	60
O, H111	≤ 200	≤ 200	200	275	85	-	18	16	60
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		200	-	85	-	16	14	60
O, H111	≤ 25		200	275	85	-	18	16	60
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		200	-	85	-	16	14	60

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 23 — Alloy EN AW-5754 [Al Mg3]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 150	≤ 150	180	-	80	-	14	12	47
	150 < D ≤ 250	150 < S ≤ 250	180	-	70	-	13	-	47
O, H111	≤ 150	≤ 150	180	250	80	-	17	15	45
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		180	-	80	-	14	12	47
O, H111	≤ 25		180	250	80	-	17	15	45
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 25		180	-	80	-	14	12	47

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 24 — Alloy EN AW-5083 [Al Mg4,5Mn0,7]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c]	≤ 200	≤ 200	270	-	110	-	12	10	70
	200 < D ≤ 250	200 < S ≤ 250	260	-	100	-	12	-	70
O, H111	≤ 200	≤ 200	270	-	110	-	12	10	70
H112	≤ 200	≤ 200	270	-	125	-	12	10	70
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c]	all		270	-	110	-	12	10	70
O, H111	all		270	-	110	-	12	10	70
H112	all		270	-	125	-	12	10	70
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c]	all		270	-	110	-	12	10	70
H112	all		270	-	125	-	12	10	70

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 25 — Alloy EN AW-5086 [Al Mg4]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
F [c], H112	≤ 250	≤ 250	240	-	95	-	12	10	65
O, H111	≤ 200	≤ 200	240	320	95	-	18	15	65
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		240	-	95	-	12	10	65
O, H111	all		240	320	95	-	18	15	65
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
F [c], H112	all		240	-	95	-	12	10	65

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] F Temper: property values are for information only.

Table 26 — Alloy EN AW-6101A [Al MgSi(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 150	≤ 150	200	-	170	-	10	8	70
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		200	-	170	-	10	8	70
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 50		200	-	170	-	10	8	70

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 27 — Alloy EN AW-6101B [Al MgSi(B)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c d]	-	≤ 15	215	-	160	-	8	6	70
T7 [c e]	-	≤ 15	170	-	120	-	12	10	60
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c d]	≤ 15		215	-	160	-	8	6	70
T7 [c e]	≤ 15		170	-	120	-	12	10	60
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c d]	≤ 15		215	-	160	-	8	6	70
T7 [c e]	≤ 15		170	-	120	-	12	10	60

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] Electrical conductivity $\gamma \geq 30$ MS/m.

[e] Electrical conductivity $\gamma \geq 32$ MS/m.

Table 28 — Alloy EN AW-6005 [Al SiMg] and Alloy EN AW-6005A [Al SiMg(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25	≤ 25	270	-	225	-	10	8	90
	25 < D ≤ 50	25 < S ≤ 50	270	-	225	-	8	-	90
	50 < D ≤ 100	50 < S ≤ 100	260	-	215	-	8	-	85
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 5		270	-	225	-	8	6	90
	5 < t ≤ 10		260	-	215	-	8	6	85
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
Open profile T4 [c]	≤ 25		180	-	90	-	15	13	50
Open profile T6 [c]	≤ 5		270	-	225	-	8	6	90
	5 < t ≤ 10		260	-	215	-	8	6	85
	10 < t ≤ 25		250	-	200	-	8	6	85
Hollow profile T4 [c]	≤ 10		180	-	90	-	15	13	50
Hollow profile T6 [c]	≤ 5		255	-	215	-	8	6	85
	5 < t ≤ 15		250	-	200	-	8	6	85

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 29 — Alloy EN AW-6106 [Al MgSiMn]

Extruded rod/bar Not specified								
Extruded tube Not specified								
Extruded profile								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
T6 [a]	≤ 10	250	-	200	-	8	6	75
[a] Properties may be obtained by press quenching.								

Table 30 — Alloy EN AW-6008 [Al SiMgV]

Extruded rod/bar Not specified								
Extruded tube								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
T4	≤ 10	180	-	90		15	13	50
T6 [a]	≤ 5	270	-	225	-	8	6	90
	5 < t ≤ 10	260	-	215	-	8	6	85
Extruded profile [b]								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
Open profile T4 [a]	≤ 10	180	-	90	-	15	13	50
Open profile	≤ 5	270	-	225	-	8	6	90
T6 [a]	5 < t ≤ 10	260	-	215	-	8	6	85
Hollow profile T4 [a]	≤ 10	180	-	90	-	15	13	50
Hollow profile	≤ 5	255	-	215	-	8	6	85
T6 [a]	5 < t ≤ 10	250	-	200	-	8	6	85
[a] Properties may be obtained by press quenching. [b] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.								

Table 31— Alloy EN AW-6110A [Al Mg0,9Si0,9MnCu(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T5 [c]	≤ 120	≤ 120	380	-	360	-	10	8	115
T6 [c]	≤ 120	≤ 150	410	-	380	-	10	8	120
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		320		220	-	16	14	85
T6 [c]	≤ 25		380	-	360	-	10	8	120
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		320		220	-	16	14	85
T6 [c]	≤ 25		380	-	360	-	10	8	120

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 32 — Alloy EN AW-6012 [Al MgSiPb]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 150	≤ 150	310	-	260	-	8	6	105
	150 < D ≤ 200	150 < S ≤ 200	260	-	200	-	8	-	105
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		310	-	260	-	8	6	105
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		310	-	260	-	8	6	105

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 33 — Alloy EN AW-6014 [Al Mg0,6SiV]

Extruded rod/bar

Not specified

Extruded tube

Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
T4 [a]	≤ 10	140		70	-	15	13	55
T6 [a]	≤ 5	250	-	200	-	8	6	80
	5 < t ≤ 10	225	-	180	-	8	6	80

Extruded profile [b]

Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
Open profile T4 [a]	≤ 10	140	-	70	-	15	13	55
Open profile	≤ 5	250	-	200	-	10	8	80
T6 [a]	5 < t ≤ 10	225	-	180	-	8	6	80
Hollow profile T4 [a]	≤ 10	140	-	70	-	15	13	55
Hollow profile	≤ 5	250	-	200	-	8	6	80
T6 [a]	5 < t ≤ 10	225	-	180	-	8	6	80

[a] Properties may be obtained by press quenching.

[b] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 34 — Alloy EN AW-6018 [Al Mg1SiPbMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 150	≤ 150	310	-	260	-	8	6	-
	150 < D ≤ 200	150 < S ≤ 200	260	-	200	-	8	-	-
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		310	-	260	-	8	6	-
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		310	-	260	-	8	6	-

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 35 — Alloy EN AW-6023 [Al Si1Sn1MgBi]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 150	≤ 150	320	-	270	-	10	8	-
Extruded tube Not specified									
Extruded profile Not specified									

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 36 — Alloy EN AW-6026 [Al MgSiBi]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** HBW Typical Value
	D[a]	S[b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511[c]	≤ 140	≤ 140	370	-	300	-	8	6	95
	140 < D ≤ 200	140 < S ≤ 200	340	-	250	-	8	6	90
	200 < D ≤ 250	200 < S ≤ 250	300	-	200	-	8	6	90

Extruded tube								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	HBW Typical Value
		min.	max.	min.	max.	min.	min.	
T6, T6510, T6511[c]	≤ 30	340	-	260	-	8	6	90

Extruded Profile								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	HBW Typical Value
		min.	max.	min.	max.	min.	min.	
T6, T6510, T6511[c]	≤ 40	340	-	260	-	8	6	90

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar..

[c] Properties may be obtained by press quenching

Table 37 — Alloy EN AW-6351 [Al Si1Mg0,5Mn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	160	-	110	14	12	35
T4 [c]	≤ 200	≤ 200	205	-	110	-	14	12	67
T6 [c]	≤ 20	≤ 20	295	-	250	-	8	6	95
	20 < D ≤ 75	20 < S ≤ 75	300	-	255	-	8	-	95
	75 < D ≤ 150	75 < S ≤ 150	310	-	260	-	8	-	95
	150 < D ≤ 200	150 < S ≤ 200	280	-	240	-	6	-	95
	200 < D ≤ 250	200 < S ≤ 250	270	-	200	-	6	-	95
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 25		-	160	-	110	14	12	35
T4 [c]	≤ 25		205	-	110	-	14	12	67
T6 [c]	≤ 5		290	-	250	-	8	6	95
	5 < t ≤ 25		300	-	255	-	10	8	95
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	all		-	160	-	110	14	12	35
T4 [c]	≤ 25		205	-	110	-	14	12	67
Open profile T5	≤ 5		270	-	230	-	8	6	90
Open profile T6 [c]	≤ 5		290	-	250	-	8	6	95
	5 < t ≤ 25		300	-	255	-	10	8	95
Hollow profile T5	≤ 5		270	-	230	-	8	6	90
Hollow profile T6 [c]	≤ 5		290	-	250	-	8	6	95
	5 < t ≤ 25		300	-	255	-	10	8	95

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 38 — Alloy EN AW-6056 [Al Si1MgCuMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4, T451, T4511[c]	≤ 80	≤ 80	350	-	245	-	15	14	95
T6, T651, T6511[c]	≤ 80	≤ 80	380	-	360	-	10	8	115
T78, T7851, T78511 [c]	≤ 80	≤ 80	360	-	335	-	10	8	105
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4, T4510, T4511[c]	≤ 10		350	-	245	-	15	14	95
T6, T6510, T6511[c]	≤ 10		380	-	360	-	10	8	115
T78, T78510, T78511 [c]	≤ 10		360	-	335	-	10	8	105

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 39 — Alloy EN AW-6060 [Al MgSi]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 150	≤ 150	120	-	60	-	16	14	50
T5	≤ 150	≤ 150	160	-	120	-	8	6	60
T6 [c]	≤ 150	≤ 150	190	-	150	-	8	6	70
T64 [c d]	≤ 50	≤ 50	180	-	120	-	12	10	60
T66 [c]	≤ 150	≤ 150	215	-	160	-	8	6	75
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 15		120	-	60	-	16	14	50
T5	≤ 15		160	-	120	-	8	6	60
T6 [c]	≤ 15		190	-	150	-	8	6	70
T64 [c d]	≤ 15		180	-	120	-	12	10	60
T66 [c]	≤ 15		215	-	160	-	8	6	75
Extruded profile [e]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		120	-	60	-	16	14	50
T5	≤ 5		160	-	120	-	8	6	60
	$5 < t \leq 25$		140	-	100	-	8	6	60
T6 [c]	≤ 5		190	-	150	-	8	6	70
	$5 < t \leq 25$		170	-	140	-	8	6	70
T64 [c d]	≤ 15		180	-	120	-	12	10	60
T66 [c]	≤ 5		215	-	160	-	8	6	75
	$5 < t \leq 25$		195	-	150	-	8	6	75

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] Bending quality.

[e] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 40 — Alloy EN AW-6360 [Al SiMgMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 150	≤ 150	110	-	50	-	16	14	40
T5	≤ 150	≤ 150	150	-	110	-	8	6	50
T6 [c]	≤ 150	≤ 150	185	-	140	-	8	6	60
T66 [c]	≤ 150	≤ 150	195	-	150	-	8	6	65
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 15		110	-	50	-	16	14	40
T5	≤ 15		150	-	120	-	8	6	50
T6 [c]	≤ 15		185	-	140	-	8	6	60
T66 [c]	≤ 15		195	-	150	-	8	6	65
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		110	-	50	-	16	14	40
T5	≤ 25		150	-	110	-	8	6	50
T6 [c]	≤ 25		185	-	140	-	8	6	60
T66 [c]	≤ 25		195	-	150	-	8	6	65

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 41 — Alloy EN AW-6061 [Al Mg1SiCu]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	150	-	110	16	14	30
T4 [c]	≤ 200	≤ 200	180	-	110	-	15	13	65
T6 [c]	≤ 200	≤ 200	260	-	240	-	8	6	95
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 25		-	150	-	110	16	14	30
T4 [c]	≤ 25		180	-	110	-	15	13	65
T6 [c]	≤ 5		260	-	240	-	8	6	95
	5 < t ≤ 25		260	-	240	-	10	8	95
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		180	-	110	-	15	13	65
T6 [c]	≤ 5		260	-	240	-	9	7	95
	5 < t ≤ 25		260	-	240	-	10	8	95

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 42 — Alloy EN AW-6261 [Al Mg1SiCuMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 100	≤ 100	-	170	-	120	14	12	-
T4 [c]	≤ 100	≤ 100	180	-	100	-	14	12	-
T6 [c]	≤ 20	≤ 20	290	-	245	-	8	7	100
	20 < D ≤ 100	20 < S ≤ 100	290	-	245	-	8	-	100
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 10		-	170	-	120	14	12	-
T4 [c]	≤ 10		180	-	100	-	14	12	-
T5	≤ 5		270	-	230	-	8	7	-
	5 < t ≤ 10		260	-	220	-	9	8	-
T6 [c]	≤ 5		290	-	245	-	8	7	100
	5 < t ≤ 10		290	-	245	-	9	8	100
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	all		-	170	-	120	14	12	-
T4 [c]	≤ 25		180	-	100	-	14	12	-
Open profile T5	≤ 5		270	-	230	-	8	7	-
	5 < t ≤ 25		260	-	220	-	9	8	-
	> 25		250	-	210	-	9	-	-
Open profile T6 [c]	≤ 5		290	-	245	-	8	7	100
	5 < t ≤ 25		280	-	235	-	8	7	100
Hollow profile T5	≤ 5		270	-	230	-	8	7	-
	5 < t ≤ 10		260	-	220	-	9	8	
Hollow profile T6 [c]	≤ 5		290	-	245	-	8	7	100
	5 < t ≤ 10		270	-	230	-	9	8	100

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 43 — Alloy EN AW-6262 [Al Mg1SiPb]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 200	≤ 200	260	-	240	-	10	8	75
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		260	-	240	-	10	8	75
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		260	-	240	-	10	8	75

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 44 — Alloy EN AW-6262A [Al Mg1SiSn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 220	≤ 155	260	-	240	-	10	8	-
Extruded tube Not specified									
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		260	-	240	-	10	8	-

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 45 — Alloy EN AW-6063 [Al Mg0,7Si]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.			
O, H111	≤ 200	≤ 200	-	130	-	-	18	16	25
T4 [c]	≤ 150	≤ 150	130	-	65	-	14	12	50
	150 < D ≤ 200	150 < S ≤ 200	120	-	65	-	12	-	50
T5	≤ 200	≤ 200	175	-	130	-	8	6	65
T6 [c]	≤ 150	≤ 150	215	-	170	-	10	8	75
	150 < D ≤ 200	150 < S ≤ 200	195	-	160	-	10	-	75
T66 [c]	≤ 200	≤ 200	245	-	200	-	10	8	80
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
O, H111	≤ 25		-	130	-	-	18	16	25
T4 [c]	≤ 10		130	-	65	-	14	12	50
	10 < t ≤ 25		120	-	65	-	12	10	50
T5	< 25		175	-	130	-	8	6	65
T6 [c]	≤ 25		215	-	170	-	10	8	75
T66 [c]	≤ 25		245	-	200	-	10	8	80
Extruded profile [e]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\ mm}$ % min.	**Hardness** Typical value HBW
			min.	max.	min.	max.			
T4 [c]	≤ 25		130	-	65	-	14	12	50
T5	≤ 10		175	-	130	-	8	6	65
	10 < t ≤ 25		160	-	110	-	7	5	65
T6 [c]	≤ 10		215	-	170	-	8	6	75
	10 < t ≤ 25		195	-	160	-	8	6	75
T64 [c d]	≤ 15		180	-	120	-	12	10	65
T66 [c]	≤ 10		245	-	200	-	8	6	80
	10 < t ≤ 25		225	-	180	-	8	6	80

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] Bending quality.

[e] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 46 — Alloy EN AW-6063A [Al Mg0,7Si(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	150	-	-	16	14	28
T4 [c]	≤ 150	≤ 150	150	-	90	-	12	10	50
	150 < D ≤ 200	150 < S ≤ 200	140	-	90	-	10	-	50
T5	≤ 200	≤ 200	200	-	160	-	7	5	75
T6 [c]	≤ 150	≤ 150	230	-	190	-	7	5	80
	150 < D ≤ 200	150 < S ≤ 200	220	-	160	-	7	-	80
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 25		-	150	-	-	16	14	28
T4 [c]	≤ 10		150	-	90	-	12	10	50
	10 < t ≤ 25		140	-	90	-	10	8	50
T5	≤ 25		200	-	160	-	7	5	75
T6 [c]	≤ 25		230	-	190	-	7	5	80
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 25		150	-	90	-	12	10	50
T5	≤ 10		200	-	160	-	7	5	75
	10 < t ≤ 25		190	-	150	-	6	4	75
T6 [c]	≤ 10		230	-	190	-	7	5	80
	10 < t ≤ 25		220	-	180	-	5	4	80

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 47 — Alloy EN AW-6463 [Al Mg0,7Si(B)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 150	≤ 150	125	-	75	-	14	12	46
T5	≤ 150	≤ 150	150	-	110	-	8	6	60
T6 [c]	≤ 150	≤ 150	195	-	160	-	10	8	74
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		195	-	160	-	10	8	74
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 50		125	-	75	-	14	12	46
T5	≤ 50		150	-	110	-	8	6	60
T6 [c]	≤ 50		195	-	160	-	10	8	74

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 48 — Alloy EN AW-6064A [Al Mg1SiBi]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 140	≤ 140	310	-	260	-	8	6	95
	140 < D ≤ 250	140 < S ≤ 250	260	-	240	-	8	6	90
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		310	-	260	-	8	6	90
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 40		310	-	260	-	8	6	90

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Characteristics may be obtained by tempering under press.

Table 49 — Alloy EN AW-6065 [Al Mg1Bi1Si]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 220	≤ 155	260	-	240	-	10	8	-
Extruded tube Not specified									
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		260	-	240	-	10	8	-

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 50 — Alloy EN AW-6081 [Al Si0,9MgMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 250	≤ 250	275	-	240	-	8	6	95
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 25		275	-	240	-	8	6	95
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
Open profile T6 [c]	≤ 25		275	-	240	-	8	6	95
Hollow profile T6 [c]	≤ 15		275	-	240	-	8	6	95

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 51 — Alloy EN AW-6082 [Al Si1MgMn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	160	-	110	14	12	35
T4 [c]	≤ 200	≤ 200	205	-	110	-	14	12	70
T6 [c]	≤ 20	≤ 20	295	-	250	-	8	6	95
	20 < D ≤ 150	20 < S ≤ 150	310	-	260	-	8	-	95
	150 < D ≤ 200	150 < S ≤ 200	280	-	240	-	6	-	95
	200 < D ≤ 250	200 < S ≤ 250	270	-	200	-	6	-	95
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	≤ 25		-	160	-	110	14	12	35
T4 [c]	≤ 25		205	-	110	-	14	12	70
T6 [c]	≤ 5		290	-	250	-	8	6	95
	5 < t ≤ 25		310	-	260	-	10	8	95
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
O, H111	all		-	160	-	110	14	12	35
T4 [c]	≤ 25		205	-	110	-	14	12	70
Open profile T5	≤ 5		270	-	230	-	8	6	90
Open profile	≤ 5		290	-	250	-	8	6	95
T6 [c]	5 < t ≤ 25		310	-	260	-	10	8	95
Hollow profile T5	≤ 5		270	-	230	-	8	6	90
Hollow profile T6 [c]	≤ 5		290	-	250	-	8	6	95
	5 < t ≤ 15		310	-	260	-	10	8	95

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 52 — Alloy EN AW-6182 [Al Si1MgZr]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T4 [c]	≤ 220	≤ 155	205	-	110	-	12	10	-
T6 [c, d]	9 < D ≤ 100	9 < S ≤ 100	360	-	330	-	9	7	-
	100 < D ≤ 150	100 < S ≤ 150	330	-	300	-	8	6	-
	150 < D ≤ 220	150 < S ≤ 220	280	-	240	-	6	4	-
Extruded tube Not specified									
Extruded profile Not specified									

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] Properties obtained by the user, however, may be lower than those listed if the material has been formed or otherwise cold or hot worked, particularly in the annealed temper, prior to normal solution heat treatment.

Table 53 — Alloy EN AW-7003 [Al Zn6Mg0,8Zr]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T5	all	all	310	-	260	-	10	8	-
T6 [c]	≤ 50	≤ 50	350	-	290	-	10	8	110
	50 < D ≤ 150	50 < S ≤ 150	340	,	280	-	10	8	110
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T5	all		310	-	260	-	10	8	-
T6 [c]	≤ 10		350	-	290	-	10	8	110
	10 < t ≤ 25		340	-	280	-	10	8	110
Extruded profile [d]									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T5	all		310	-	260	-	10	8	-
T6 [c]	≤ 10		350	-	290	-	10	8	110
	10 < t ≤ 25		340	-	280	-	10	8	110

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Table 54 — Alloy EN AW-7005 [Al Zn4,5Mg1,5Mn]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 50	≤ 50	350	-	290	-	10	8	110
	50 < D ≤ 200	50 < S ≤ 200	340	-	270	-	10	-	110
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 15		350	-	290	-	10	8	110
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 40		350	-	290	-	10	8	110

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 55 — Alloy EN AW-7108 [Al Zn5Mg1Zr]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 100	≤ 100	310	-	260		10	8	90
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 20		310	-	260	-	10	8	90
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 30		310	-	260	-	10	8	90

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 56 — Alloy EN AW-7108A [Al Zn5Mg1Zr(A)]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 200	≤ 200	310	-	260		12	10	90
T66 [c]	≤ 50	≤ 50	350	-	290	-	10	8	105
	50 < D ≤ 200	50 < S ≤ 200	340	-	275	-	10	-	105
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 20		310	-	260	-	12	10	90
T66 [c]	≤ 20		350	-	290	-	10	8	105
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\,mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 40		310	-	260	-	12	10	90
T66 [c]	≤ 40		350	-	290	-	10	8	105

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 57 — Alloy EN AW-7020 [Al Zn4,5Mg1]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 50	≤ 50	350	-	290	-	10	8	110
	50 < D ≤ 200	50 < S ≤ 200	340	-	275	-	10	-	110
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 15		350	-	290	-	10	8	110
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 40		350	-	290	-	10	8	110

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 58 — Alloy EN AW-7021 [Al Zn5,5Mg1,5]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 40	≤ 40	410	-	350	-	10	8	120
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 10		410	-	350	-	10	8	120
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6 [c]	≤ 20		410	-	350	-	10	8	120

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 59 — Alloy EN AW-7022 [Al Zn5Mg3Cu]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 80	≤ 80	490	-	420	-	7	5	133
	80 < D ≤ 200	80 < S ≤ 200	470	-	400	-	7	-	
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		490	-	420	-	7	5	133
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511 [c]	≤ 30		490	-	420	-	7	5	133

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] Properties may be obtained by press quenching.

Table 60 — Alloy EN AW-7049A [Al Zn8MgCu]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
T6, T6510, T6511	≤ 100	≤ 100	610	-	530	-	5	4	170
	100 < D ≤ 125	100 < S ≤ 125	560	-	500	-	5	-	170
	125 < D ≤ 150	125 < S ≤ 150	520	-	430	-	5	-	170
	150 < D ≤ 180	150 < S ≤ 180	450	-	400	-	3	-	170
Extruded tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511	≤ 30		610	-	530	-	5	4	170
Extruded profile									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
			min.	max.	min.	max.	min.	min.	
T6, T6510, T6511	≤ 30		610	-	530	-	5	4	170

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

Table 61 — EN AW-7075 [Al Zn5,5MgCu]

Extruded rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
	D [a]	S [b]	min.	max.	min.	max.	min.	min.	
O, H111	≤ 200	≤ 200	-	275	-	165	10	8	60
T6, T6510, T6511	≤ 25	≤ 25	540	-	480	-	7	5	150
	25 < D ≤ 100	25 < S ≤ 100	560	-	500	-	7	-	150
	100 < D ≤ 150	100 < S ≤ 150	550	-	440	-	5	-	150
	150 < D ≤ 200	150 < S ≤ 200	440	-	400	-	5	-	150
T73, T73510, T73511 [c]	≤ 25	≤ 25	485	-	420	-	7	5	135
	25 < D ≤ 75	25 < S ≤ 75	475	-	405	-	7	-	135
	75 < D ≤ 100	75 < S ≤ 100	470	-	390	-	6	-	135
	100 < D ≤ 150	100 < S ≤ 150	440	-	360	-	6	-	135

Extruded tube								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
O, H111	≤ 10	-	275	-	165	10	-	60
T6, T6510, T6511	≤ 5	540	-	485	-	8	6	150
	5 < t ≤ 10	560	-	505	-	7	5	150
	10 < t ≤ 50	560	-	495	-	6	4	150
T73, T73510, T73511 [c]	≤ 5	470	-	400	-	7	5	135
	5 < t ≤ 25	485	-	420	-	8	6	135
	25 < t ≤ 50	475	-	405	-	8	-	135

Extruded profile [d]								
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\ mm}$ %	**Hardness** Typical value HBW
		min.	max.	min.	max.	min.	min.	
T6, T6510, T6511	≤ 25	530	-	460	-	6	4	150
	25 < t ≤ 60	540	-	470	-	6	-	150
T73, T73510, T73511 [c]	≤ 25	485	-	420	-	7	5	135

[a] D = Diameter for round bar.

[b] S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

[c] For materials of thickness 20 mm or above, see EN 755–1, with respect to stress corrosion cracking resistance.

[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section.

Annex A
(informative)

List of tempers used in Tables 1 to 61 (extract of EN 515)

Temper	
Symbol	**Definition**
F	as fabricated (no mechanical property limits specified)
O	annealed - products achieving the required annealed properties after hot forming processes may be designated as O temper
H111	annealed and slightly strain-hardened (less than H11) during subsequent operations such as stretching or straightening
H112	slightly strain-hardened from working at an elevated temperature or from a limited amount of cold work (mechanical property limits specified), such as stretching or straightening
T3	solution heat-treated, cold worked and naturally aged
T3510	solution heat-treated, stress-relieved by stretching a controlled amount (permanent set 1 % to 3 %) and naturally aged The products receive no further straightening after stretching.
T3511	same as T3510 except that minor straightening is allowed after stretching to comply with standard tolerances
T4	solution heat-treated and naturally aged
T4510	solution heat-treated, stress-relieved by stretching a controlled amount (permanent set 1 % to 3 %) and naturally aged The products receive no further straightening after stretching.
T4511	same as T4510 except that minor straightening is allowed after stretching to comply with standard tolerances
T5	cooled from an elevated temperature shaping process and then artificially aged
T6	solution heat-treated and then artificially aged
T64	solution heat-treated and then artificially aged in underageing conditions (between T6 and T61) to improve formability
T6510	solution heat-treated, stress-relieved by stretching a controlled amount (permanent set 1 % to 3 %) and then artificially aged The products receive no further straightening after stretching.
T6511	same as T6510 except that minor straightening is allowed after stretching to comply with standard tolerances
T66	solution heat-treated and then artificially aged - mechanical property level higher than T6 achieved through special control of the process (6000 series alloys)
T7	solution heat-treated and then artificially overaged
T73	solution heat-treated and then artificially overaged in order to achieve the best stress corrosion resistance
T73510	solution heat-treated, stress-relieved by stretching a controlled amount (permanent set 1 % to 3 %)

Temper	
Symbol	**Definition**
	and then artificially overaged in order to achieve the best stress corrosion resistance The products receive no further straightening after stretching.
T73511	same as T73510 except that minor straightening is allowed after stretching to comply with standard tolerances
T8	solution heat-treated, cold worked and then artificially aged
T8510	solution heat-treated, stress-relieved by stretching a controlled amount (permanent set 1 % to 3 %) and then artificially aged The products receive no further straightening after stretching.
T8511	same as T8510 except that minor straightening is allowed after stretching to comply with standard tolerances

Bibliography

[1] EN 515, *Aluminium and aluminium alloys - Wrought products - Temper designations*

[2] EN 573-3, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products*

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