Aluminium billet for the Extrusion Process

Description and smelting process

Aluminium billet used for the extrusion process

The aluminium billet is a fundamental form in the extrusion industry, where it is transformed into aluminium profiles of various shapes and sizes. These billets are available in various different alloys, each with specific properties that make them suitable for different applications. The most common diameters are 7", 8", 9", and 10".

Aluminium alloys

The chemical compositions and applications of some common alloys used in extrusion are detailed below:

- **6060:** This alloy contains approximately 0.3–0.6% magnesium and 0.3–0.6% silicon. It is known for its excellent corrosion resistance and good weldability, making it ideal for architectural structures and window frames.

- **6063:** Composed of 0.2–0.6% magnesium and 0.45–0.9% silicon, this alloy has good mechanical strength and high-quality surface finishes. It is primarily used in structural and decorative profiles for construction.

- **6005:** With a content of 0.6–0.9% magnesium and 0.6–0.9% silicon, this alloy has greater strength than 6063, making it suitable for applications requiring greater structural strength, such as in the transportation and automotive industries.

- **6082:** Containing 0.7-1.3% magnesium and 0.6-1.2% silicon, it is noted for its high corrosion resistance and is used in the naval industry, bridge structures, and cranes.

- **6061:** Includes 0.8-1.2% magnesium, 0.4-0.8% silicon, and 0.15-0.4% copper, providing an excellent combination of mechanical strength, corrosion resistance, and ease of machining. It is commonly used in aeronautical and automotive components, and building structures.

- **7000 series:** These alloys, such as 7075, contain approximately 5.6–6.1% zinc, along with small amounts of magnesium and copper, providing extremely high strength. They are used in applications with demanding requirements, such as aerospace, military, and high-performance automotive industries.

ALLOY EN AW 6060

Composition

In accordance with EN 573-3

%	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others	Al
Minimum	0.30	0.10			0.35						
Maximum	0.60	0.30	0.10	0.10	0.60	0.05		0.15	0.10	0.15	Rest

Equivalent names

International **ISO standard**	Europe **EN standard**	Spain **UNE standard**	Germany **DIN standard**	France **AFNOR* standard**	United Kingdo **BS* standard**	USA **AA standard**
Al MgSi	EN AW 6060	L-3441	AlMgSi0.5	A-GS	H9	6026

*Previous names

Product Formats

In accordance with EN 573-3

Forging	Wire			Cali-brated product	Extruded product	Foil	Finstock	Laminates	Material for packaging	Discs	Welded tubes
	Electrical Conduction	Welding	Machining								
●			●	●	●		●			●	

Technological suitability

Welding		Transformation processes		Natural behaviour	
Torch	●	Swarf fragmentation	●	In a rural environment	▲
Argon gas welding	▲	Surface gloss	▲	In an industrial environment	●
Electrical resistance	●	Cold forming	●	In a marine environment	●
Brazing	▲	Deep drawing	●	In seawater	●

Anodised		Coating		Food	
For protection	▲	Lacquered	▲	Food use	▲
Decorative	▲	Galvanised	●		
Hard anodised	▲	Electroless nickel	●		

Key Very good ▲ Good ● Fair ⬡ Poor/avoid *

Observations

This alloy, along with 6063, is the most widely used for profile extrusion due to its high extrudability index. It has inferior mechanical characteristics when compared to alloys 6005 and 6082, but its greater ability to be extruded allows more complex sections to be made.

Typical physical caracteristics

Elastic Modulus N/ mm²	Transverse Elastic Modulus G N/ mm²	Specific Weight g/ cm³	Melting Range °C	Coefficient of linear expansion µm/ mK	Thermal conductivity W/ mK	Electrical resistivity µΩ m	Electrical conductivity % IACS	Reduction Potential V
69,500	26,100	2.82	610–655	23.4	195-209	32-35	48-54	–0.80

Mechanical characteristics

Calibrated bars

In accordance with EN 754-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<80	<80	130	-	65	-	15	13	50
T6	<80	<80	215	-	160	-	12	10	75

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded bars

In accordance with EN 755-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<150	<150	120	-	60	-	16	14	50
T5	<150	<150	160	-	120	-	8	6	60
T6	<150	<150	190	-	150	-	8	6	70
T64	<50	<50	180	-	120	-	12	10	60
T66	<150	<150	215	-	160	-	8	6	75

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded tubes

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<15	120	-	60	-	16	14	50
T5	<15	160	-	120	-	8	6	60
T6	<15	190	-	150	-	8	6	70
T64	<15	180	-	120	-	12	10	60
T66	<15	250	-	160	-	8	6	75

Extruded profiles

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	120	-	60	-	16	14	50
T5	<5	160	-	120	-	8	6	60
	5<e<25	140	-	100	-	8	6	60
T6	<3	190	-	150	-	8	6	70
	3<e<25	170	-	140	-	8	6	70
T64	<15	180	-	120	-	12	10	60
T66	<3	215	-	160	-	8	6	75
	3<e<25	195	-	150	-	8	6	75

ALLOY EN AW 6063

Composition

In accordance with EN 573-3

%	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others	Al
Minimum	0.20				0.45						
Maximum	0.60	0.35	0.10	0.10	0.90	0.10		0.10	0.10	0.15	Rest

Equivalent names

International **ISO standard**	Europe **Norma EN**	Spain **EN standard**	Germany **DIN standard**	France **AFNOR* standard**	United Kingdom BS* standard	USA AA standard
Al Mg0.7Si	EN AW 6063	L-3441	AlMgSi0.5	A-GS	H9	6063

*Previous names

Product Formats

In accordance with EN 573-3

Forging	Wire			Cali-brated product	Extruded product	Foil	Finstock	Laminates	Material for packa-ging	Discs	Welded tubes
	Electrical Conduction	Welding	Machining								
				●	●						

Technological suitability

Welding		Transformation processes		Natural behaviour	
Torch	●	Swarf fragmentation	●	In a rural environment	▲
Argon gas welding	▲	Surface gloss	▲	In an industrial environment	●
Electrical resistance	●	Cold forming	●	In a marine environment	●
Brazing	▲	Deep drawing	●	In seawater	●

Anodised		Coating		Food	
For protection	▲	Lacquered	▲	Food use	▲
Decorative	▲	Galvanised	●		
Hard anodised	▲	Electroless nickel	●		

Key ▲ Very good ● Good ⬠ Fair * Poor/avoid

Observations

This alloy, along with 6060. is the most widely used for profile extrusion due to its high extrudability index. It has inferior mechanical characteristics when compared to alloys 6005 and 6082, but its greater ability to be extruded allows more complex sections to be made.

This alloy has numerous applications and is the main alloy used in carpentry and architectural products as well as for standardised profiles.

Typical physical properties

Elastic Modulus N/ mm²	Transverse Elastic Modulus G N/ mm²	Specific Weight g/ cm³	Melting Range °C	Coefficient of linear expansion µm/ mK	Thermal conductivity W/ mK	Electrical resistivity µΩ m	Electrical conductivity % IACS	Reduction Potential V
69,500	26,100	2.70	615–655	23.5	193-218	30-35	49.5-57.5	–0.80

Mechanical characteristics

Calibrated bars

In accordance with EN 754-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<80	<80	150	-	75	-	15	13	50
T6	<80	<80	220	-	190	-	10	8	75
T66	<80	<80	235	-	195	-	10	8	80

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded bars

In accordance with EN 755-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<150	<150	130	-	65	-	14	12	50
	150<Ø<200	150<S<200	120	-	65	-	12	10	50
T5	<200	<200	175	-	130	-	8	6	65
T6	<150	<150	215	-	170	-	10	8	75
	150<Ø<200	150<S<200	195	-	160	-	10	-	75
T66	<200	<200	245	-	200	-	10	8	80

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded tubes

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<10	130	-	65	-	14	12	50
	10<e<25	120	-	65	-	12	10	50
T5	<25	175	-	130	-	8	6	65
T6	<25	215	-	170	-	10	8	75
T66	<25	245	-	200	-	10	8	80

Extruded profiles

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	130	-	65	-	14	12	50
T5	<3	175	-	130	-	8	6	65
	3<e<25	160	-	110	-	7	5	65
T6	<10	215	-	170	-	8	6	75
	10<e<25	195	-	160	-	8	6	75
T66	<5	245	-	200	-	8	6	80
	10<e<25	225	-	180	-	8	6	80

ALLOY EN AW 6005A

Composition

In accordance with EN 573-3

%	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others	Al
Minimum	0.50				0.40						
Maximum	0.90	0.35	0.30	0.50	0.70	0.30		0.20	0.10	0.15	Rest

Equivalent names

International **ISO standard**	Europe **Norma EN**	Spain **EN standard**	Germany DIN standard	France AFNOR* standard	United Kingdom BS* standard	USA AA standard
Al SiMg(A)	EN AW 6005A	L-3454	AlMgSi0.7	A-GS0.5	-	6005

*Previous names

Product Formats

In accordance with EN 573-3

Forging	Wire			Cali-brated product	Extruded product	Foil	Finstock	Laminates	Material for packaging	Discs	Welded tubes
	Electrical Conduction	Welding	Machining								
●				●	●						

Technological suitability

Welding		Transformation processes		Natural behaviour	
Torch	●	Swarf fragmentation	●	In a rural environment	▲
Argon gas welding	▲	Surface gloss	▲	In an industrial environment	●
Electrical resistance	●	Cold forming	●	In a marine environment	●
Brazing	●	Deep drawing	●	In seawater	●

Anodised		Coating		Food	
For protection	▲	Lacquered	●	Food use	▲
Decorative	●	Galvanised	●		
Hard anodised	●	Electroless nickel	●		

Key Very good ▲ Good ● Fair ⬠ Poor/avoid *

Observations

Extrusion alloy used mainly for complex structural profiles that are subjected to stress. This alloy has superior characteristics to the 6060/6063 alloy although it has a lower extrudability index. In its T5 state it has a superior surface finish, better straightness and clearer and more regular anodising.

Typical physical properties

Elastic Modulus N/ mm²	Transverse Elastic Modulus G N/ mm²	Specific Weight g/ cm³	Melting Range °C	Coefficient of linear expansion µm/ mK	Thermal conductivity W/ mK	Electrical resistivity µΩ m	Electrical conductivity % IACS	Reduction Potential V
70.000	26,400	2.71	575-650	23.1	167-216	31-41	42-55,5	-0.83

Mechanical characteristics

Laminated products

In accordance with EN 485-2

State	Thickness		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Radio de plegado e=espesor (mm)		Hard-ness HB
	from	till	min	max	min	max	A_{50}	A	180°	90°	
O	>0.4	1.5	-	150	-	85	14	-	1.0e	0.5e	40
	1.5	3,0	-	150	-	85	16	-	1.0e	1.0e	40
	3.0	6.0	-	150	-	85	18	-	-	1.0e	40
	6.0	12.5	-	150	-	85	17	-	-	2.5e	40
	12.5	25.0	-	155	-	-	-	16	-	-	40
T4 T451	>0.4	1.5	205	-	110	-	12	-	3.0e	1.5e	58
	1.5	3.0	205	-	110	-	14	-	3.0e	2.0e	58
	3.0	6.0	205	-	110	-	15	-	-	3.0e	58
	6.0	12.5	205	-	110	-	14	-	-	4.0e	58
	12.5	40.0	205	-	110	-	-	13	-	-	58
	40.0	80.0	205	-	110	-	-	12	-	-	58
T6 T651	>0.4	1.5	310	-	260	-	6	-	-	2.5e	94
	1.5	3.0	310	-	260	-	7	-	-	3.5e	94
	3.0	6.0	310	-	260	-	10	-	-	4.5e	94
	6.0	12.5	300	-	255	-	9	-	-	6.0e	91
	12.5	60.0	295	-	240	-	-	8	-	-	89
	60.0	100.0	295	-	240	-	-	7	-	-	89
	100.0	150.0	275	-	240	-	-	6	-	-	84
	150.0	175.0	275	-	230	-	-	4	-	-	83
	175.0	300.0	260	-	220	-	-	2	-	-	-

Calibrated bars

In accordance with EN 754-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<80	<80	205	-	110	-	14	12	70
T6	<80	<80	310	-	255	-	10	9	95

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded bars

In accordance with EN 755-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hard-ness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A_{mm}	
T4	<200	<200	205	-	110	-	14	12	35
T6	<20	<20	295	-	250	-	8	6	95
	20<Ø<150	20<S<150	310	-	260	-	8	-	95
	150<Ø<200	150<S<200	280	-	240	-	6	-	95
	200<Ø<250	200<S<250	270	-	200	-	6	-	95

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded tubes

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	205	-	110	-	14	12	70
T6	<5	290	-	250	-	8	6	95
	5<e<25	310	-	260	-	10	8	95

Extruded profiles

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	205	-	110	-	14	12	70
T5	<5	270	-	230	-	8	6	90
T6	<5	290	-	250	-	8	6	95
	5<e<25	310	-	260	-	10	8	95

ALLOY EN AW 6082

Composition

In accordance with EN 573-3

%	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others	Al
Minimum	0.70		0.15	0.40	0.60						
Maximum	1.30	0.50	0.10	1.00	1.20	0.25		0.20	0.10	0.15	Rest

Equivalent names

International **ISO standard**	Europe **Norma EN**	Spain **EN standard**	Germany **DIN standard**	France **AFNOR* standard**	United Kingdom BS* standard	USA AA standard
Al Si1MgMn	EN AW 6082	L-3451	AlMgSi1	A-GSM0.7	H30	6082

*Previous names

Product Formats

In accordance with EN 573-3

Forging	Wire			Cali-brated product	Extruded product	Foil	Finstock	Laminates	Material for packaging	Discs	Welded tubes
	Electrical Conduction	Welding	Machining								
●			●	●	●			●		●	●

Technological suitability

Welding		Transformation processes		Natural behaviour	
Torch	●	Swarf fragmentation	●	In a rural environment	▲
Argon gas welding	▲	Surface gloss	▲	In an industrial environment	●
Electrical resistance	●	Cold forming	⬠	In a marine environment	●
Brazing	●	Deep drawing	⬠	In seawater	●

Anodised		Coating		Food	
For protection	▲	Lacquered	●	Food use	▲
Decorative	●	Galvanised	●		
Hard anodised	●	Electroless nickel	●		

Key Very good ▲ Good ● Fair ⬠ Poor/avoid *

Observations

This alloy is used in both extrusion and lacquered products. It has average mechanical characteristics and good forgeability. It has good weldability but loses almost 30% of its tensile strength in the welded area so ageing treatment is recommended to recover the lost characteristics.

It has a slightly lower extrusion index than 6060/6063 alloys, but its superior mechanical characteristics make it suitable for complex profiles that are subjected to stress.

Typical physical properties

Elastic Modulus N/ mm²	Transverse Elastic Modulus G N/ mm²	Specific Weight g/ cm³	Melting Range °C	Coefficient of linear expansion µm/ mK	Thermal conductivity W/ mK	Electrical resistivity µΩ m	Electrical conductivity % IACS	Reduction Potential V
69,500	26,100	2.70	615–655	23.5	193-218	30-35	49.5-57.5	–0.80

Mechanical characteristics

Calibrated bars

In accordance with EN 754-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<80	<80	150	-	75	-	15	13	50
T6	<80	<80	220	-	190	-	10	8	75
T66	<80	<80	235	-	195	-	10	8	80

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded bars

In accordance with EN 755-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<150	<150	130	-	65	-	14	12	50
	150<Ø<200	150<S<200	120	-	65	-	12	10	50
T5	<200	<200	175	-	130	-	8	6	65
T6	<150	<150	215	-	170	-	10	8	75
	150<Ø<200	150<S<200	195	-	160	-	10	-	75
T66	<200	<200	245	-	200	-	10	8	80

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded tubes

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<10	130	-	65	-	14	12	50
	10<e<25	120	-	65	-	12	10	50
T5	<25	175	-	130	-	8	6	65
T6	<25	215	-	170	-	10	8	75
T66	<25	245	-	200	-	10	8	80

Extruded profiles

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	130	-	65	-	14	12	50
T5	<3	175	-	130	-	8	6	65
	3<e<25	160	-	110	-	7	5	65
T6	<10	215	-	170	-	8	6	75
	10<e<25	195	-	160	-	8	6	75
T66	<5	245	-	200	-	8	6	80
	10<e<25	225	-	180	-	8	6	80

ALLOY EN AW 6061

Composition

In accordance with EN 573-3

%	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others	Al
Minimum	0.40		0.15		0.80	0.04					
Maximum	0.80	0.70	0.40	0.15	1.20	0.35		0.25	0.15	0.15	Rest

Equivalent names

International **ISO standard**	Europe **Norma EN**	Spain **EN standard**	Germany **DIN standard**	France **AFNOR* standard**	United Kingdom **BS* standard**	USA **AA standard**
Al Mg1SiCu	EN AW 6061	L-3420	AlMg1SiCu	A-GSUC	H20	6061

*Previous names

Product Formats

In accordance with EN 573-3

Forging	Wire			Calibrated product	Extruded product	Foil	Finstock	Laminates	Material for packaging	Discs	Welded tubes
	Electrical Conduction	Welding	Machining								
●			●	●	●			●		●	

Technological suitability

Welding		Transformation processes		Natural behaviour	
Torch	●	Swarf fragmentation	⬡	In a rural environment	●
Argon gas welding	▲	Surface gloss	▲	In an industrial environment	●
Electrical resistance	●	Cold forming	●	In a marine environment	●
Brazing	●	Deep drawing	●	In seawater	●

Anodised		Coating		Food	
For protection	▲	Lacquered	●	Food use	▲
Decorative	●	Galvanised	●		
Hard anodised	●	Electroless nickel	●		

Key Very good ▲ Good ● Fair ⬡ Poor/avoid *

Observations

This alloy was developed to have mechanical characteristics between those of alloy 6063 and the Aluminium-Copper and Aluminium-Zinc alloys. The time between tempering and artificial ageing should be no greater than 2 hours. This alloy, which can be hardened by heat treatment, has good weldability but loses almost 30% of its tensile strength in the area of the weld.
It has many industrial applications such as the manufacture of moulds, dies, machinery and tools, etc.

Typical physical properties

Elastic Modulus N/ mm²	Transverse Elastic Modulus G N/ mm²	Specific Weight g/ cm³	Melting Range °C	Coefficient of linear expansion µm/ mK	Thermal conductivity W/ mK	Electrical resistivity µΩ m	Electrical conductivity % IACS	Reduction Potential V
70,000	26,300	2.70	580-650	23.3	155-180	37-43	40-46.5	-0.83

Mechanical characteristics

Laminated products

In accordance with EN 485-2

State	Thickness		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Radio de plegado e=espesor (mm)		Hard-ness HB
	from	till	min	max	min	max	A_{50}	A	180°	90°	
O	>0.4	1.5	-	150	-	85	14	-	1.0e	0.5e	40
	1.5	3,0	-	150	-	85	16	-	1.0e	1.0e	40
	3.0	6.0	-	150	-	85	19	-	-	1.0e	40
	6.0	12.5	-	150	-	85	16	-	-	2.0e	40
	12.5	25.0	-	150	-	-	-	16	-	-	40
T4 T451	>0.4	1.5	205	-	110	-	12	-	1.5e	1.0e	58
	1.5	3.0	205	-	110	-	14	-	2.0e	1.5e	58
	3.0	6.0	205	-	110	-	16	-	-	3.0e	58
	6.0	12.5	205	-	110	-	18	-	-	4.0e	58
	12.5	40.0	205	-	110	-	-	15	-	-	58
	40.0	80.0	205	-	110	-	-	14	-	-	58
T6 T651	>0.4	1.5	290	-	240	-	6	-	-	2.5e	88
	1.5	3.0	290	-	240	-	7	-	-	3.5e	88
	3.0	6.0	290	-	240	-	10	-	-	4.0e	88
	6.0	12.5	290	-	240	-	9	-	-	5.0e	88
	12.5	40.0	290	-	240	-	-	8	-	-	88
	40.0	80.0	290	-	240	-	-	6	-	-	88
	80.0	100.0	290	-	240	-	-	5	-	-	88
	100.0	150.0	275	-	240	-	-	5	-	-	84
	150.0	250.0	265	-	230	-	-	4	-	-	81
	250.0	350.0	260	-	220	-	-	4	-		80
	350.0	400.0	260	-	220	-	-	2	-	-	80

Calibrated bars

In accordance with EN 754-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A	
T4	<200	<200	180	-	110	-	15	13	65
T6	<200	<200	260	-	240	-	8	6	95

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded bars

In accordance with EN 755-2

State	Measurements		Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hard-ness HB
	Ø*1	S*2	min	max	min	max	A_{50}	A_{mm}	
T4	<200	<200	180	-	110	-	15	13	65
T6	<200	<200	260	-	240	-	8	6	95

*1 Diameter of round bar *2 Length of side of square/hexagonal bar

Extruded tubes

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	180	-	110	-	15	13	65
T6	<5	260	-	240	-	8	6	95
	5<e<25	260	-	240	-	10	8	95

Extruded profiles

In accordance with EN 755-2

State	Wall thickness	Tensile strength R_m (MPa)		Yield strength $R_{p0.2}$ (MPa)		Elongation % min		Hardness HB
		min	max	min	max	A_{50}	A_{mm}	
T4	<25	180	-	110	-	15	13	65
T6	<5	260	-	240	-	9	7	95
	5<e<25	260	-	240	-	10	8	95

Aluminium billet smelting process

The process of smelting aluminium to create a billet uses both scrap and primary aluminium. The blend of these two elements is crucial to achieving the desired properties in the final alloy.

Components and effects of blending

- **Scrap:** Uses recycled resources, which helps reduce costs and environmental impact. Nevertheless, the quality and purity of the scrap aluminium can vary, so meticulous control is essential during the blending process.

- **Primary Aluminium:** Ensures the purity and quality of the material and is essential for obtaining high-performance alloys.

Required alloy elements

Alloy elements, such as magnesium, silicon, copper, and zinc, are essential to produce specific properties for each alloy. For example:

- **Magnesium:** Improves strength and hardness.
- **Silicon:** Increases corrosion resistance and facilitates extrusion.
- **Copper:** Adds mechanical strength and improves electrical conductivity.
- **Zinc:** Significantly increases strength.

These elements must be added in the precise amounts to achieve the desired characteristics in the alloys.

Green and Ecological Smelting

Adopting environmentally friendly methods in aluminium smelting can significantly reduce the carbon footprint. These methods include:

· Using renewable energy for smelting.
· Maximising use of recycled scrap aluminium.
· Implementing advanced technologies to reduce emissions.

These practices not only reduce CO_2 emissions but also contribute to industry sustainability.

Environmental Impact Certifications

There are several certifications and standards that evaluate and certify environmentally friendly practices in aluminium smelting, such as:

- **ISO 14001:** Environmental Management Systems.
- **Carbon Footprint Certification:** Quantification and reduction of CO_2 emissions.
- **European Ecolabel:** Certification of products that comply with high environmental standards.

Complying with these certifications demonstrates a company's commitment to environmental protection and sustainability.

Smelting Process