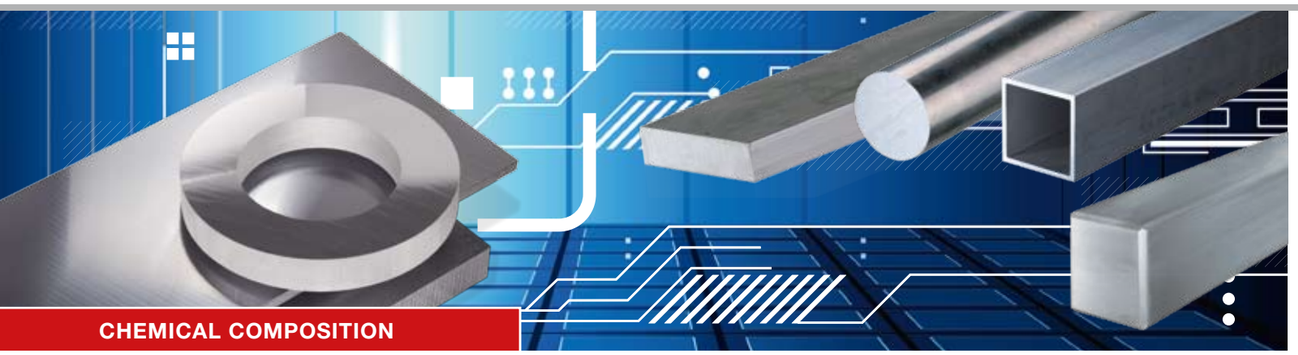
EN AW-7075



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Zn5,5 Mg Cu
Old designation	Al Zn Mg Cu1,5
Material no. according to DIN	3.4365
Great Britain BS	2L95
Italy UNI	9007/2
Spain	
Sweden	
Norway	
France AFNOR	A-Z5GU
Colour code	RAL 4005 Blue Lilac

Typical physical properties:

Density [g/cm³]		2,80
Elastic modulus [GPa]		72
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,6
	20°C – 100°C	23,4
	20°C – 200°C	24,3
	20°C – 300°C	25,2
Specific heat J/(kg * K)		862
Electrical conductivity [m/Ω*mm²]		19 – 23
Shear modulus [GPa]		27,1

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,50	1,2 – 2,0	0,30	2,1 – 2,9	0,18 – 0,28	-	5,1 – 6,1	0,20	-	-	[3]	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

[3] *Sum for Zr+Ti max. 0,25. This applies to forged or extruded products when the value has been agreed upon between the customer and supplier.*

Special features of this material:

- Curable alloy with very high strength
- Very high fatigue strength
- Good machinability

Applications:

- Tool making, mould making and model making
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	≤ 30°C/h to 230°C + 3 – 5 hours hold time, below 230°C in air

Hardening	
Solution annealing	470°C – 480°C
Quenching	water
Natural ageing treatment	Artificial ageing is usual
Artificial ageing treatment	1. stage 110°C – 125°C · 12 – 24 hours 2. stage 165°C – 180°C · 4 – 6 hours

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	4 – 5
Erosion	1

Surface treatment

Anodising - (protective anodisation)	3
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding

		Filler metal
Gas	5	
WIG	5	
MIG	5	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	5
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	4
Sea water atmosphere	4

Metal forming

Cold forming		Delivery condition
Bending	4	O
Pressure forming	5	
Deep drawing (condition-based)	4 – 5	O
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	4	
Extrusion moulding	4 – 5	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term approx. 90°C Short-term approx. 110°C – 125°C

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

We supply aluminium sheets and plates of alloy EN AW-7075 · Al Zn5,5 Mg Cu in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
1 – 4	2.000 x 1.000	2.020 x 1.020	
5 – 250	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520
Super formats	4.020 x 2.520		

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T6 T62 T651	≥ 0,4	0,8	525	-	460	-	6	-	-	4,5 t[8]	157
	0,8	1,5	540	-	460	-	6	-	-	5,5 t[8]	160
	1,5	3,0	540	-	470	-	7	-	-	6,5 t[8]	161
	3,0	6,0	545	-	475	-	8	-	-	8,0 t[8]	163
	6,0	12,5	540	-	460	-	8	-	-	12,0 t[8]	160
	12,5	25,0	540	-	470	-	-	6	-	-	161
	25,0	50,0	530	-	460	-	-	5	-	-	158
	50,0	60,0	525	-	440	-	-	4	-	-	155
	60,0	80,0	495	-	420	-	-	4	-	-	147
	80,0	90,0	490	-	390	-	-	4	-	-	144
	90,0	100,0	460	-	360	-	-	3	-	-	135
	100,0	120,0	410	-	300	-	-	2	-	-	119
	120,0	150,0	360	-	260	-	-	2	-	-	104
	150,0	200,0	360	-	240	-	-	2	-	-	-
	200,0	300,0	360	-	220	-	-	1	-	-	-
T652	150,0	200,0	360	-	260	-	-	1	-	-	-
	200,0	300,0	360	-	260	-	-	1	-	-	-

5	*Other possible delivery conditions for this alloy: O · T73 · T7351 · T76 · T7651*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*
9	*For information only*

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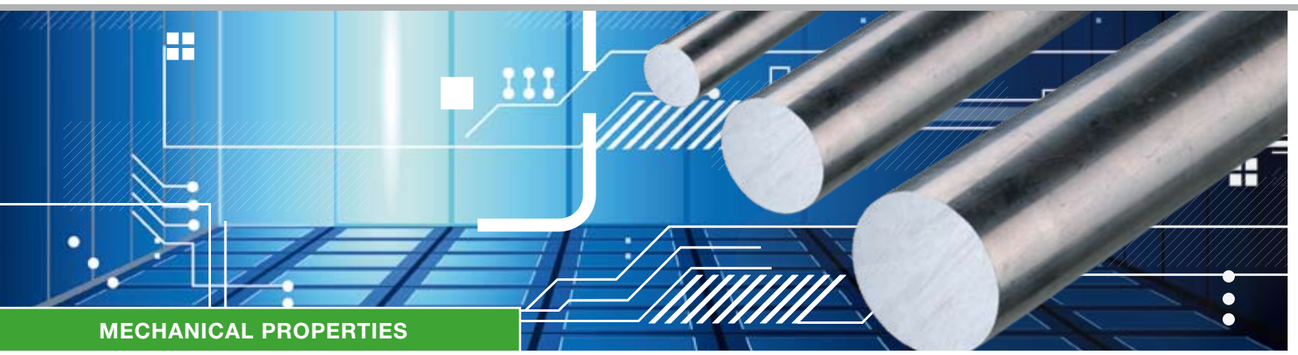

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	540	-	485	-	6	7	150
T651	≤ 80	540	-	485	-	4	5	150
T73	≤ 80	455	-	385	-	8	10	135
T7351	≤ 80	455	-	385	-	6	8	135

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 25	540	-	480	-	5	7	150
	> 25 to ≤ 100	560	-	500	-	-	7	150
	> 100 to ≤ 150	550	-	440	-	-	5	150
	> 150 to ≤ 200	440	-	400	-	-	5	150
T73 T73510 T73511	≤ 25	485	-	420	-	5	7	135
	> 25 to ≤ 75	475	-	405	-	-	7	135
	> 75 to ≤ 100	470	-	390	-	-	6	135
	> 100 to ≤ 150	440	-	360	-	-	6	135

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

We supply aluminium round bars of alloy 7075 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 500

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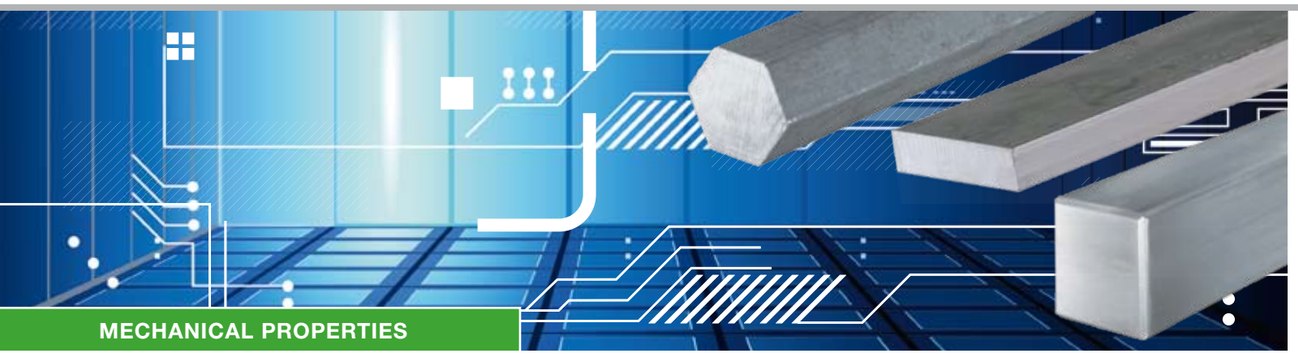

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	540	-	485	-	6	7	150
T651	≤ 80	540	-	485	-	4	5	150
T73	≤ 80	455	-	385	-	8	10	135
T7351	≤ 80	455	-	385	-	6	8	135

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 25	540	-	480	-	5	7	150
	> 25 to ≤ 100	560	-	500	-	-	7	150
	> 100 to ≤ 150	530	-	470	-	-	6	150
	> 150 to ≤ 200	470	-	400	-	-	5	150
T73 T73510 T73511	≤ 25	485	-	420	-	5	7	135
	> 25 to ≤ 75	475	-	405	-	-	7	135
	> 75 to ≤ 100	470	-	390	-	-	6	135
	> 100 to ≤ 150	440	-	360	-	-	6	135

[9] *For information only*

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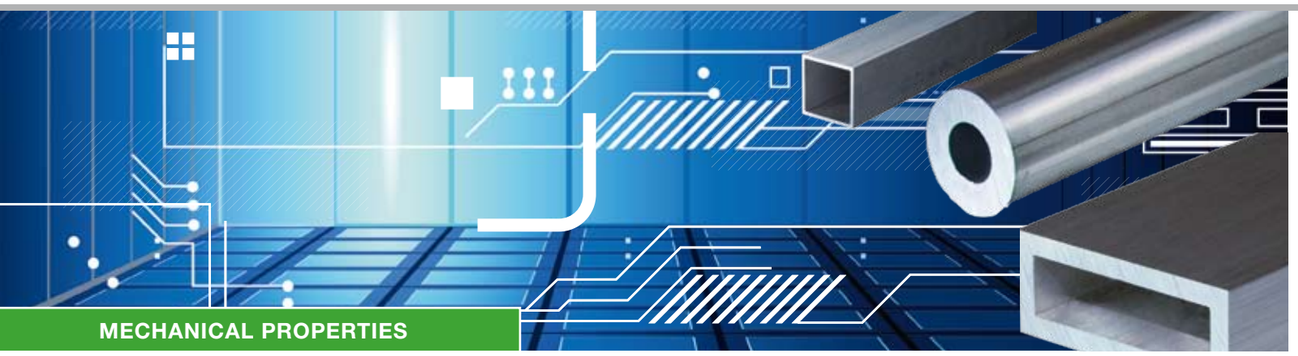

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 20	540	-	485	-	6	7	150
T6510 / T6511	≤ 20	540	-	485	-	4	5	150
T73	≤ 20	455	-	385	-	8	10	135
T73510 / T73511	≤ 20	455	-	385	-	6	8	135

9 *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 5	540	-	485	-	6	8	150
	> 5 to ≤ 10	560	-	505	-	5	7	150
	> 10 to ≤ 50	560	-	495	-	4	6	150
T73 T73510 T73511	≤ 5	470	-	400	-	5	7	135
	> 5 to ≤ 25	485	-	420	-	6	8	135
	> 25 to ≤ 50	475	-	405	-	-	8	135

5 *Other possible delivery conditions for this alloy: O, H111*

9 *For information only*

Profiles drawn · pressed

EN AW-7075 Al Zn5,5 Mg Cu

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 25	530	-	460	-	4	6	150
	> 25 ≤ 60	540	-	470	-	-	6	150
T73 / T73510 T73511	≤ 25	485	-	420	-	5	7	135

9 *For information only*

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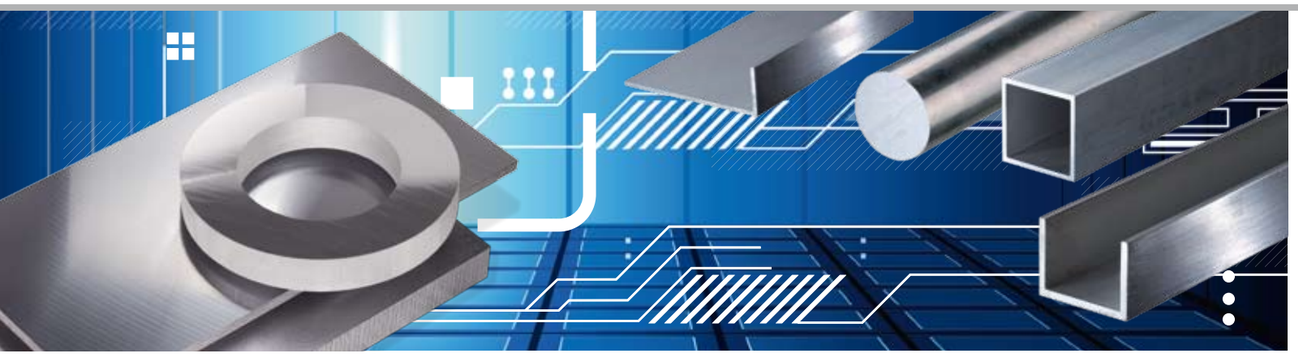

F	Production state (no limit values for mechanical properties defined).
H111	Annealed and slightly work-hardened by subsequent operations, e.g. stretching or adjustment (less than H11).
H112	Slightly work-hardened by hot forming or limited cold forming (with defined limit values of the mechanical properties).
H116	Applies to aluminium-magnesium alloys with a magnesium content > = 4% for which the limit values of the mechanical properties and the resistance to exfoliation corrosion are defined.
H12	Work-hardened - 1/4 hard.
H14	Work-hardened - 1/2 hard.
H16	Work-hardened - 3/4 hard.
H18	Work-hardened - 4/4 hard (fully through-hardened).
H19	Work-hardened - extra hard.
H22	Work-hardened and re-annealed - 1/4 hard.
H24	Work-hardened and re-annealed - 1/2 hard.
H26	Work-hardened and re-annealed - 3/4 hard.
H28	Work-hardened and re-annealed - 4/4 hard (fully through-hardened).
H32	Work-hardened and stabilised - 1/4 hard.
H34	Work-hardened and stabilised - 1/2 hard.
H36	Work-hardened and stabilised - 3/4 hard.
H38	Work-hardened and stabilised - 4/4 hard (fully through-hardened).
H42	Work-hardened and enamelled - 1/4 hard.
H44	Work-hardened and enamelled - 1/2 hard.
H46	Work-hardened and enamelled - 3/4 hard.
H48	Work-hardened and enamelled - 4/4 hard (fully through-hardened).
Hxx4	Applies to embossed or stamped metal sheets or strips, which are produced from the corresponding Hxx state.
Hxx5	Work-hardened - Applies for welded tubes.
O	Soft annealed - With the O state, products can be designated for which the required properties for the soft annealed state are achieved by the hot-forming process.
O1	Thermally treated almost at the solution annealing temperature and time and cooled slowly to room temperature (formerly known as T41).
O2	Thermomechanically treated to improve formability as required for Superplastic Forming (SPF), for example.
O3	Homogenised.
T1	Quenched from the hot forming temperature and naturally aged.
T2	Quenched from the hot forming temperature, cold formed and naturally aged.
T3	Solution annealed, cold formed and naturally aged.
T31	Solution annealed, about 1% cold formed and naturally aged.

T351	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and naturally aged. The products are not readjusted after stretching.
T3510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and naturally aged. The products are not readjusted after stretching.
T3511	As T3510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T352	Solution annealed, stress relief by 1% to 5% permanent upsetting and naturally aged.
T354	Solution annealed, stress relief by cold readjustment in the finisher and naturally aged.
T36	Solution annealed, about 6% cold formed and naturally aged.
T37	Solution annealed, about 7% cold formed and naturally aged.
T39	Solution annealed and a certain degree of cold forming to achieve the specified mechanical properties. Cold forming can be done before or after the natural ageing treatment.
T4	Solution annealed and naturally aged.
T42	Solution annealed and naturally aged. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T451	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and naturally aged. The products are not readjusted after stretching.
T4510	Solution annealed, stress relief by controlled stretching (stretching degree: 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and naturally aged. The products are not readjusted after stretching.
T4511	As T4510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T452	Solution annealed, stress relief by 1% to 5% permanent upsetting and naturally aged.
T454	Solution annealed, stress relief by cold readjustment in the finisher and naturally aged.
T5	Quenched from the hot forming temperature and artificially aged.
T51	Quenched from the hot forming temperature and not fully artificially aged to improve malleability.
T56	Quenched from the hot forming temperature and artificially aged - better mechanical properties than T5 by special process control (alloy of 6000 series).
T6	Solution annealed and artificially aged.
T61	Solution annealed and not fully artificially aged to improve malleability.
T6151	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates) and then not fully artificially aged to improve malleability. The products are not readjusted after stretching.
T62	Solution annealed and artificially aged. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T64	Solution annealed and then not fully artificially aged to improve malleability (between T6 and T61).
T651	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and artificially aged. The products are not readjusted after stretching.
T6510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and artificially aged. The products are not readjusted after stretching.
T6511	As T6510, but slight subsequent readjustment to comply with the specified limits of size allowed .
T652	Solution annealed, stress relief by 1% to 5% permanent upsetting and artificially aged.
T654	Solution annealed, stress relief by cold readjustment in the finisher and artificially aged.

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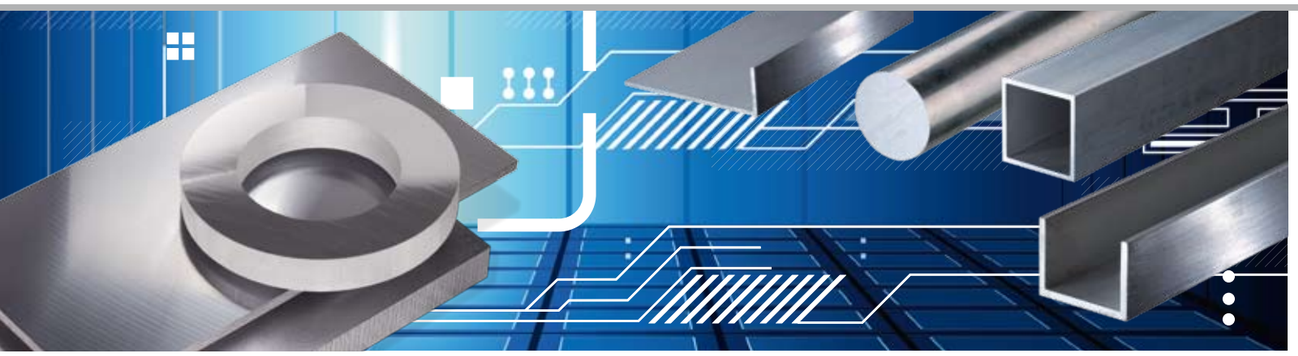
Delivery conditions



T66	Solution annealed and artificially aged - better mechanical properties than T6 by special control of the process (alloy of 6000 series).
T7	Solution annealed and overcured (artificially aged).
T73	Solution annealed and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T732	Solution annealed and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T7351	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. The products are not readjusted after stretching.
T73510	Solution annealed by stress relief by controlled stretching (stretching degree: 1% to 3% for extruded rods, profiles and pipes, 0.5% to 3% for drawn tubes) and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. The products are not readjusted after stretching.
T73511	As T73510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7352	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T7354	Solution annealed, stress relief by cold readjustment in the finisher and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T74	Solution annealed and overcured (artificially aged) (between T73 and T76).
T7451	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) (between T73 and T76). The products are not readjusted after stretching.
T74510	Solution annealed, stress relief by controlled stretching (stretching degree; 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and overcured (artificially aged) (between T73 and T76). The products are not readjusted after stretching.
T74511	As T74510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7452	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) (between T73 and T76).
T7454	Solution annealed, stress relief by cold readjustment in finisher and overcured (artificially aged) (between T73 and T76).
T76	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T761	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion (applies to sheets and strips made of material 7475).
T762	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T7651	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. The products are not readjusted after stretching.
T76510	Solution annealed, stress relief by controlled stretching (stretching degree: 1% to 3% for extruded rods, profiles and pipes, 0.5% to 3% for drawn tubes) and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. The products are not readjusted after stretching.
T76511	As T76510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7652	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T7654	Solution annealed, stress relief by cold readjustment in the finisher and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T79	Solution annealed and (very limitedly) overcured (artificially aged).
T79510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and (very limitedly) overcured (artificially aged). The products are not readjusted after stretching.
T79511	As T79510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T8	Solution annealed, cold formed and artificially aged.
T81	Solution annealed, about 1% cold formed and artificially aged.
T82	Solution annealed by the consumer stretched in a controlled manner by at least 2% and artificially aged (alloy 8090).
T832	Solution annealed stretched in a controlled manner to a certain degree and artificially aged (applies to drawn tubes made of material 6063)
T841	Solution annealed, cold formed and not fully artificially aged (applies to sheets and strips made of alloys 2091 and 8090).
T84151	Solution annealed, stress relief by controlled stretching with a stretching degree of 1.5% to 3% and not fully artificially aged (plates made of alloys 2091 and 8090).
T851	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and artificially aged. The products are not readjusted after stretching.
T8510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and artificially aged. The products are not readjusted after stretching.
T8511	As T8510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T852	Solution annealed, stress relief by 1% to 5% permanent upsetting and artificially aged.
T854	Solution annealed, stress relief by cold readjustment in the finisher and artificially aged.
T86	Solution annealed, about 6% cold formed and artificially aged.
T87	Solution annealed, about 7% cold formed and artificially aged.
T89	Solution annealed and cold formed to a certain degree to achieve the specified mechanical properties and artificially aged.
T9	Solution annealed, cold formed and artificially aged.
W	Solution annealed (unstable state). The time span of natural ageing can also be specified (W2H. . .).
W51	Solution annealed (unstable state), stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings). The products are not readjusted after stretching.
W510	Solution annealed (unstable state) and stress relief by controlled stretching (stretching degree 1% to 3% for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes). The products are not readjusted after stretching.
W511	As W510, but slight subsequent readjustment to comply with the specified limits of size allowed.
W52	Solution annealed (unstable state) and stress relief by 1% to 5% permanent upsetting.
W54	Solution annealed (unstable state) and stress relief by cold readjustment in the finisher (forgings).

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