

Alloy EN AW-6005A [Al SiMg(A)]

Technical datasheet - Extruded products

Medium strength structural alloy. It has a good combination of strength, toughness, surface finish and is more suitable than 6082 for decorative anodising.

Widespread use in engineering, transportation, and leisure applications such as yacht masts, train carriages, running boards for SUVs and complex sections for railway, bus and truck structures.

Typical Applications

- Structural elements
- Boat masts
- Railway applications

Chemical Composition¹

Si		Fe		Cu		Mn*		Mg		Cr		Zn		Ti		Pb		Bi	Sn	Others	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Max	Max	Each	Tot
0.50	0.90		0.35		0.30		0.50	0.40	0.70		0.30		0.20		0.10					0.05	0.15

* Mn + Cr: 0,12 - 0,50

¹ Chemical composition in weight-% according to EN-573-3:2013

Mechanical Properties^{2,3}

Temper	Wall thickness t [mm]	R _{p0,2} [MPa]	R _m [MPa]	A [%]	A _{50mm} [%]	HBW ^c TYPICAL VALUE	Vickers ^c TYPICAL VALUE	Webster ^c TYPICAL VALUE
Open Profile T4 ^a	t ≤ 25	90	180	15	13	50	56	9
	t ≤ 5	225	270	8	6	90	105	16
Open Profile T6 ^a	5 < t ≤ 10	215	260	8	6	85	98	15
	10 < t ≤ 25	200	250	8	6	85	98	15
Hollow Profile T4 ^a	t ≤ 10	90	180	15	13	50	56	9
	t ≤ 5	215	255	8	6	85	98	15
Hollow Profile T6 ^a	5 < t ≤ 15	200	250	8	6	85	98	15

² Properties according to EN 755-2:2016 for extruded profile, minimum values unless else specified

³ 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 section

^a Properties may be obtained by press quenching

^c Brinell hardness values for information only. Vickers and Webster converted from Brinell value and should be considered approximate

Temper Designations⁴

T4	Solution heat treated and naturally aged
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
T66	Solution heat treated and then artificially aged – mechanical property level higher than T6 achieved through special control of the process

⁴ Temper designations according to EN 515:1993

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Physical Properties⁵

Temper	Modulus of Elasticity [GPa]	Modulus of Rigidity [GPa]	Melting Range [°C]	Density [g/cm ³]	Thermal Conductivity [W/m·K]	Specific Heat Capacity [J/kg·K]	Electrical Resistivity [nΩm]	Coefficient of linear expansion [10 ⁻⁶ K ⁻¹]
T6	70	26	605 - 655	2.71	176	898	36	23.3

⁵ Reference: MNC Handbok nr 12, version 2, SIS, 1989. Typical properties at room temperature 20°C

Comparative Characteristics of Related Alloys⁶

Property	6060	6063	6005	6005A	6082
Tensile strength	1	2	3	3	4
Impact strength	2	2	1	3	4
Surface finish	5	4	3	3	2
Suitability for decorative anodizing	5	5	4	3	2
Corrosion resistance	5	5	4	4	4
Machinability	2	3	4	4	5
Coldforming	5	5	4	4	3
Weldability	5	5	5	5	4

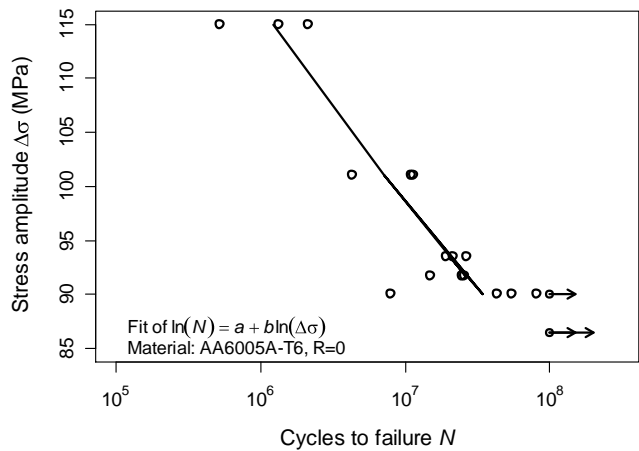
⁶ Relative grading, 5 = top grade

Fatigue Properties

Example of fatigue properties for 6005A in temper T6. Provided for informational purposes only, not to be considered as guaranteed properties. Results are valid for the investigated specimens taken from a specific sample.

Tests performed at 20 ± 2 °C on 7 mm diameter cylindrical specimens parallel to the extrusion direction by Sapa Technology, Finspång, Sweden.

Axial testing, constant amplitude, sine wave loading at around 100 Hz test frequency. Load ratio (min. stress / max. stress) R = 0. Runouts after 10⁸ cycles are indicated by the arrows.

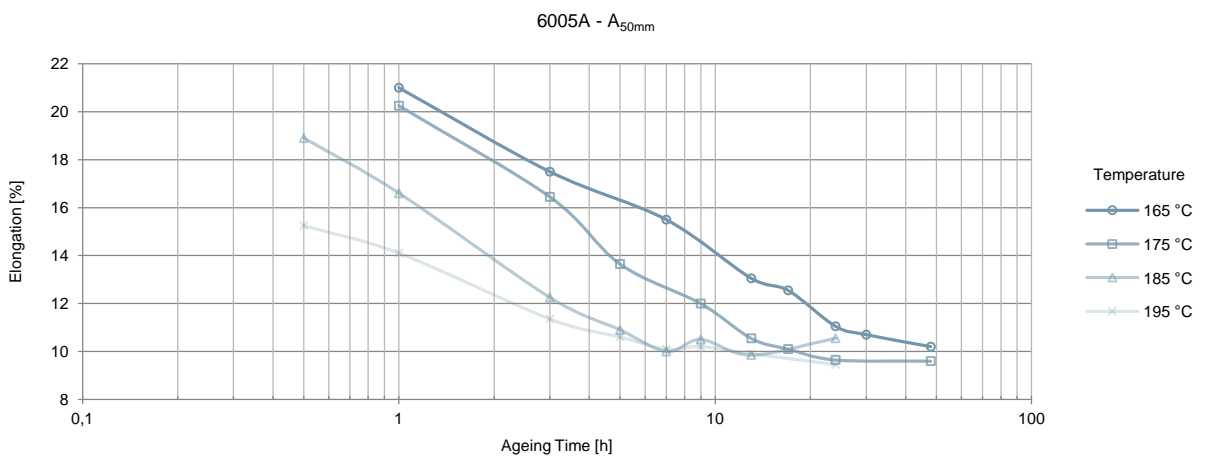
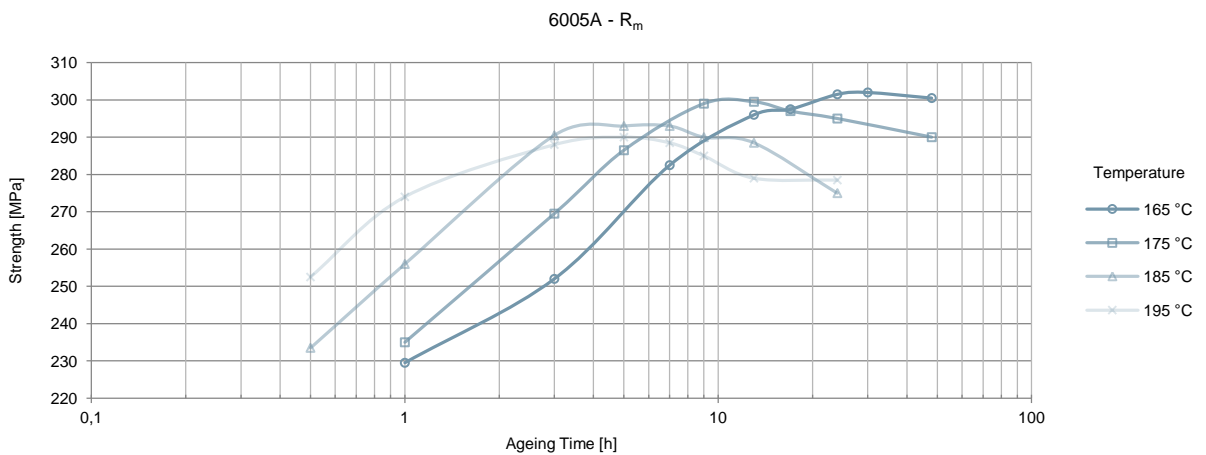
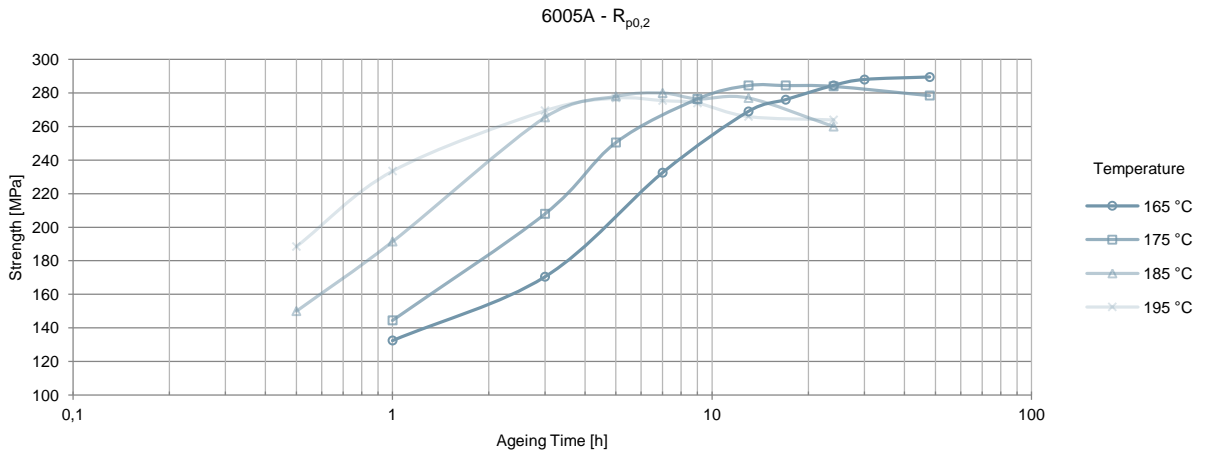


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Heat Treatment Response⁸

Example of heat treatment response for alloy 6005A.



⁸ Solid profile, 200 x 3mm, water quenched after extrusion, 24h natural ageing prior to artificial ageing, properties in extrusion direction