Extruded Aluminum Alloy 6005A

Alloy 6005A is a medium strength alloy that produces standard and custom shape extrusions, which can be solid or hollow. This versatile alloy can be used in both structural and architectural applications.

It is resilient to corrosion which makes it a common choice for the automotive, industrial, electrical and equipment industries. 6005A can be anodized or painted, welded or brazed, depending on the desired finished product. Consult a material safety data sheet for safety & handing precautions when using this alloy.

6005A displays improved toughness characteristics when compared to Alloy 6005 and Alloy 6105, and due to its chemical composition, 6005A provides improved extrudability compared to alloy 6061. However, because of the difference in manganese & chromium, alloy 6005A should not be confused with 6005. Alloy 6005A-T61 temper offers mechanical properties similar to that of 6061-T6. 6005A T1, T5, & T61 tempers are included in ASTM B221, ASTM B241, and ASTM B429 specifications.

COMMON USES FOR ALLOY 6005A

- Automotive components
- Marine fittings & hardware
- Ladders, platforms, furniture and structures
- Building & constructions applications

CHEMICAL COMPOSITION

Melting Temperature Range: 1110-1200°F | Density 0.098 lb./in³

Alloy	Si	Fe	Cu	Mn*	Mg	Cr*	Zn	Ti	Other	
									Each	Total
6005A	0.50- 0.9	0.35	0.30	0.50	0.40- 0.7	0.30	0.20	0.10	0.05	0.15

Remainder is aluminum
Chemical composition in weight percent maximum unless shown as a range or minimum.
Average Coefficient of Thermal Expansion (68° to 212°F) = 13.1 x 10^{-6} (in./in.°F)

* 0.12 to 0.50 total Mn + Cr

6005A TEMPER DESIGNATIONS & DEFINITIONS

Standard Tempers	Standard Temper Definitions*
T1	Cooled from an elevated temperature shaping process and aged naturally.[A]
T5	Cooled from an elevated temperature shaping process and aged artificially.[A]
T61	Solution heat-treated and aged artificially.[B]

* For additional details of definitions, see Aluminum Association's Aluminum Standards and Data manual and Tempers for Aluminum and Aluminum Alloy Products.
[A] Applies to products that are not cold worked after cooling from an elevated temperature shaping process, or in which the effect of cold work in flattening or straightening may not be recognized in mechanical properties.
[B] Applies to products that are not cold worked after solution heat treatment, or in which the effect of cold work in flattening or straightening may not be recognized in mechanical properties.

6005A EXTRUDED MECHANICAL & PHYSICAL PROPERTY LIMITS[1*]

Alloy	Standard Tempers	Wall Thickness[2] Inches (min.)	Tensile Strenth (ksi)		Elongation[3] % (min.)	Typical Electrical Conductivity, @68ºF, % IACS	Typical Thermal Conductivity, @77°F, BTU-in./ft.2 hr.°F (W/m-K@25ºC)
			Ultimate (min.)	Yield - 0.2% offset (min.)			
6005A	**-T1**	Up thru 0.249	25.0	14.5	15	47	1220 (176)
	-T5	Up thru 0.249	38.0	31.0	7	50	1340 (193)
		0.250 - 0.999	38.0	31.0	9	50	1340 (193)
	-T61	Up thru 0.249	38.0	35.0	8	49	1310 (188)
		0.250 - 1.000	38.0	35.0	10	49	1310 (188)
6061	**-T6**	Up thru 0.249	38.0	35.0	8	43	1160 (167)
		0.250 & above	38.0	35.0	10	N/A	N/A
6005	**-T5**	0.00 - 0.124	38.0	35.0	8	50	1310 (188)
		0.125 - 1.000	38.0	35.0	10	N/A	N/A

1. Minimum property levels unless shown as a range or indicated as a maximum.
2. The thickness of the cross section from which the tension test specimen is taken determines the applicable mechanical properties.
3. For materials of such dimensions that a standard test specimen cannot be taken, or for shapes thinner than .062", the test for elongation is not required. Elongation percent is minimum in 2" or 4 times specimen diameter.

* Mechanical property values for 6005A-T1,-T5,-T61 tempers per Aluminum Association. Values for 6005A-T6 temper per EN755-2 specification.

COMPARATIVE CHARACTERISTICS OF RELATED ALLOYS/TEMPERS