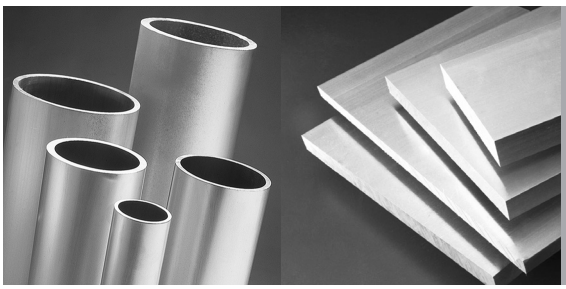
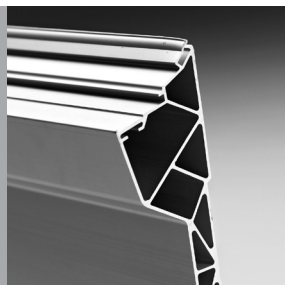
Hydro



We are aluminum



Alloy 6005/6105

Among Extrusion North America's structural 6xxx series alloys, 6005 and 6105 are medium strength alloys that are very similar to alloy 6061 except they contain higher amounts of silicon. These alloys are used in designs that require moderate strength, but are generally not recommended for applications where the structure may be susceptible to impact or overloading.

When bending is required, the naturally aged -T1 temper is preferred. However, due to the excess silicon content, properties may increase more rapidly with room temperature natural aging than typically experienced with 6063 and 6061alloys. In comparison to
6061, alloys 6005 and 6105 are easier to extrude and are less quench sensitive, allowing them to be used for more complex shapes. Alloys 6005 and 6105, when produced to a -T5 temper, have the same minimum tensile and yield strength as 6061-T6. In comparison to 6063, alloys 6005 and 6105 in -T5 tempers have better machinability and strength properties than 6063-T6.

Alloys 6005 and 6105 can also be welded or brazed using various commercial methods (caution: direct contact with dissimilar materials can cause galvanic corrosion), although the heat from welding can reduce strength. Consult the Safety Data Sheet (SDS) for proper safety and handling precautions when using 6005 and 6105 alloys.

These alloys also offer good finishing characteristics and respond well to common anodizing methods such as clear, clear and color dye, and hardcoat.

Typical applications for 6005/6105 alloy:

- Automotive connector stock
- Seamless and structural tubing
- Structural members
- Ladder structures
- Hand rail tubing

6005/6105 Temper Designations and Definitions

Standard Tempers	Standard Temper Definitions*
F	As fabricated. There is no special control over thermal conditions and there are no mechanical property limits.
T1	Cooled from an elevated temperature shaping process and naturally aged. (See Note A.)
T5	Cooled from an elevated temperature shaping process & artificially aged. (See Note A.)
T6	Solution heat-treated and artificially aged. (See Note B.)

* For further details of definitions, see Aluminum Association's Aluminum Standards and Data manual and Tempers for Aluminum and Aluminum Alloy Products.

Note 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.

Note 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.

Chemical Composition

Melting Temperature Range 6005: 1125-1210 ºF
6105: 1110-1200 ºF

Density: 0.097 lb./in.^{3}

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	
									Each	Total
6005	0.6-0.9	0.35	0.10	0.10	0.40-0.6	0.10	0.10	0.10	0.05	0.15
6105	0.6-1.0	0.35	0.10	0.15	0.45-0.8	0.10	0.10	0.10	0.05	0.15

Chemical composition in weight percent maximum unless shown as a range or minimum.

Aluminum = Remainder

Average Coefficient of Thermal Expansion (68º to 212ºF) = 13.1 x 10^{-6} (in./in.ºF)

Alloy 6005/6105

6005/6105 Extruded Mechanical and Physical Property Limits[1]

Alloy	Standard Tempers	Wall Thickness[2] (min.)		Tensile Strength ksi (MPa)		Elongation[3] % (min.)	Typical Thermal Conductivity, @77°F, BTU-in./ft.²hr.°F (W/m-K@25ºC)	Typical Electrical Conductivity, @68ºF, % IACS
		Inches	mm	Ultimate (min.)	Yield - 0.2% offset (min.)			
6005	-T1	.500 max.	up thru 12.50	25.0 (170)	15.6 (105)	16	1250 (180)	47
	-T5	up thru 0.124	up thru 3.20	38.0 (260)	35.0 (240)	8	1310 (188)	49
		0.125 - 1.000	>3.20 - 25.00	38.0 (260)	35.0 (240)	10	1310 (188)	49
6105	-T1	.500 max.	up thru 12.50	25.0 (170)	15.0 (105)	16	1220 (176)	46
	-T5	up thru 0.124	up thru 3.20	38.0 (260)	35.0 (240)	8	1340 (193)	50
		0.125 - 1.000	>3.20 - 25.00	38.0 (260)	35.0 (240)	10	1340 (193)	50
	-T6	.500 max.	up thru 12.50	38.0 (260)	35.0 (240)	8	1340 (193)	50

1. Minimum property levels unless shown as a range or indicated as a maximum (max.)
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.

Comparative Characteristics of Related Alloys/Tempers[1]

Alloy	Temper	Formability	Machinability	General Corrosion Resistance	Weldability	Brazeability	Anodizing Response
		D C B A	D C B A	D C B A	D C B A	D C B A	D C B A
6005	-T1	N/A	N/A				
	-T5	N/A	N/A				
6105	-T1	N/A	N/A	N/A			
	-T5	N/A	N/A	N/A			
6061	-T4						
	-T6						
6063	-T4						
	-T6						
6262	-T6						

1. Rating: A = Excellent B = Good C = Fair D = Poor

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