

## Aluminum 7075 T6 Specification

**Aluminum Alloy 7075-T6** is a **high-strength, heat-treatable aluminum alloy** primarily used in aerospace, defense, automotive, and other high-performance engineering sectors. The **T6 temper** means the material has been **solution heat-treated and artificially aged**, achieving maximum strength and hardness.

Alloy 7075, a cold finished aluminum wrought product, has the highest strength of all aluminum screw machine alloys. The -T6 and -T651 tempers have a typical tensile strength of 83 ksi, which is higher than many mild steels. Due to its very high strength, alloy 7075 is used for highly stressed structural parts. Applications include aircraft fittings, gears and shafts, fuse parts, meter shafts and gears, missile parts, regulating valve parts, worm gears, keys, and various other commercial aircraft, aerospace and defense equipment. Rod and bar product forms can be machined on multi-spindle and CNC machining equipment.

### Machining

Alloy 7075 offers good machinability when machined using single-point or multi-spindle carbide tools on screw machines. The use of a chip breaker is recommended. The alloy is rated “B” on the Aluminum Association machinability rating system, giving curled or easily broken chips with good to excellent surface finish.

### Corrosion

Alloy 7075 has moderate corrosion resistance. The overaged -T73 and -T7351 tempers offers good stress-corrosion cracking resistance as compared to the -T6 and -T651 tempers. (Caution: direct contact by dissimilar metals can cause galvanic corrosion.)

<b>7075 Temper Designations and Definitions</b>	
<b>Standard Tempers</b>	<b>Standard Temper Definitions*</b>
T6, T651	Solution heat-treated and then artificially aged. 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. Temper -T651 applies to products that are stress-relieved by stretching.
T73, T7351	Solution heat-treated and overaged/stabilized. Applies to wrought products that are artificially aged after solution heat-treatment to carry them beyond a point of maximum strength to provide control of some significant characteristic other than mechanical properties. Applies to cast products that are artificially aged after solution heat-treatment to provide dimensional and strength stability.

## General Information

Property	Specification
Standard	ASTM B209, ASTM B221, ASTM B241, AMS 4045, AMS
Designation	4165
Alloy	7075
Temper	T6 (solution heat-treated + aged)
Form	Sheet, plate, bar, rod, pipe, tubing, extrusion

## Mechanical Properties (Typical - T6 Temper)

Property	Value
Tensile Strength	$\geq 510$ MPa (74,000 psi)
Yield Strength (0.2%)	$\geq 430$ MPa (63,000 psi)
Elongation	7 - 11% (depending on thickness)
Brinell Hardness	~150 HB
Modulus of Elasticity	71.7 GPa (10.4 x 10 <sup>3</sup> ksi)
Shear Strength	~330 MPa
Fatigue Strength	~160 MPa (rotating beam)
Density	2.81 g/cm <sup>3</sup>

## Common Applications

- Aerospace components (wings, fuselage, landing gear)
- High-performance automotive parts (suspension, drivetrain)
- Military and defense systems
- Bicycle frames and sporting goods
- Mold and tooling plates
- Structural tubing for robotics and automation

**Forms:** Round bar, flat bar, plates, sheets, seamless tubes, extrusions

**Standards:** ASTM B2 09, B221, B241, AMS 40 45, AMS 4165, DIN EN 573-3, EN 755-2

