

Material Information



Aluminum 7075

Introduction

Aluminum 7075 is a high-strength 7000 series aluminum alloy containing zinc, magnesium, and copper as its principal alloying elements. It offers a high strength-to-weight ratio, good fatigue performance, and good machinability, making it suitable for CNC-machined components that require high mechanical strength and lightweight construction.

Advantages

Very high strength-to-weight ratio, good fatigue performance, and good machinability. Aluminum 7075 is well suited to precision CNC machining and high-performance components where strength and weight reduction are important.

Disadvantages

Aluminum 7075 generally has lower corrosion resistance than commonly used alloys such as 6061 and has more limited weldability. Its higher strength also makes it more demanding in applications where joining or extensive forming is required.

Tolerance

3DSPRO can manufacture and inspect to tight tolerances, including sub +/- 0.001" tolerances, per your drawing specifications and GD&T callouts.

Recommendation

The high strength, fatigue performance, and machinability of Aluminum 7075 make it suitable for CNC machined parts used in aerospace, automotive, industrial, and other high-performance applications. It is particularly appropriate for structural and mechanical components where high strength and low weight are critical.

Material Specifications (For reference only.)	
Tensile strength	500MPa
Fatigue strength	158MPa
Elongation at Break	11%
Hardness	150 HB
Density	2.81 g/cm ³

Attention

Aluminum 7075 is available in different tempers, including T6, T651, and T7351, and its mechanical properties and stress-corrosion-cracking resistance vary with temper. When corrosion resistance or long-term structural performance is important, the appropriate temper should be specified. For highly corrosive environments, a suitable protective surface treatment may also be considered.

Applications

3DSPRO finds people using Aluminum 7075 to make functional parts and prototypes in the following industries and applications.

Aerospace components:

Aircraft fittings, gears, shafts, structural components, and other highly stressed lightweight parts.

Automotive and transportation:

High-strength brackets, shafts, gears, sprockets, suspension components, and lightweight mechanical parts.

Industrial equipment:

Machine components, shafts, gears, valve components, couplings, and other high-strength precision parts.

Sports and consumer products:

Bicycle components, ATV sprockets, high-performance hardware, and other lightweight products requiring high mechanical strength.