

Material Information



Aluminum 7050

Introduction

Aluminum 7050 is a high-strength 7000 series aluminum alloy containing zinc, magnesium, and copper, with zirconium added for metallurgical control. It provides a strong combination of strength, fracture toughness, fatigue resistance, and resistance to exfoliation corrosion and stress-corrosion cracking, making it well suited for high-performance CNC-machined components.

Advantages

Very high strength, good fracture toughness, strong fatigue performance, and improved resistance to exfoliation corrosion and stress-corrosion cracking compared with many other high-strength aluminum alloys. Aluminum 7050 is particularly suitable for lightweight components that require a demanding combination of mechanical strength and durability.

Disadvantages

Aluminum 7050 is generally selected for high-performance applications rather than general-purpose machining because of its higher material cost and more demanding processing requirements. Its properties also depend strongly on the selected temper and product form, so the specified alloy temper should be matched to the intended application.

Tolerance

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

Recommendation

The combination of high strength, fracture toughness, fatigue resistance, and corrosion resistance makes Aluminum 7050 suitable for CNC machined components used in aerospace and other high-performance applications. It is particularly appropriate for structural and mechanical parts where high strength and damage tolerance are important while keeping weight low.

Material Specifications (For reference only.)	
Tensile strength	485MPa
Fatigue strength	155MPa

Elongation at Break	11%
Hardness	148 HB
Density	2.83 g/cm ³

Attention

Aluminum 7050 is available in several tempers, including T7351, T7451, and T7651, and the mechanical and corrosion-related properties vary between them. The appropriate temper should therefore be specified when strength, fracture toughness, or resistance to stress-corrosion cracking is important. Material selection should also take the required product form and section thickness into account.

Applications

3DSPRO finds people using Aluminum 7050 to make functional parts and prototypes in the following industries and applications.

Aerospace components:

Aircraft structural components, bulkheads, frames, fittings, wing components, and other highly stressed lightweight parts.

Aviation and transportation:

High-strength brackets, housings, shafts, structural fittings, and other components requiring high mechanical performance.

Industrial equipment:

Precision mechanical components, structural parts, high-load brackets, and other applications requiring high strength and fatigue resistance.

High-performance engineering:

Lightweight structural components, precision fixtures, and other CNC machined parts where strength, fracture toughness, and corrosion resistance are important.