

Material Information



Alloy Steel 4130

Introduction

Alloy Steel 4130, also known as AISI 4130 or UNS G41300, is a chromium-molybdenum low-alloy steel known for its combination of strength, toughness, ductility, wear resistance, and hardenability. It can be heat-treated to achieve different levels of strength and toughness, making it suitable for CNC-machined components used in demanding mechanical applications.

Advantages

Good strength, toughness, wear resistance, and hardenability, together with good machinability in annealed and cold-drawn conditions. Alloy Steel 4130 can also be welded using conventional commercial methods and heat-treated to obtain different combinations of mechanical properties.

Disadvantages

Alloy Steel 4130 has limited inherent corrosion resistance compared with stainless steels and may require protective treatment in corrosive environments. Its machining difficulty also increases as hardness rises after heat treatment, making machining conditions and the selected material condition important for CNC production.

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 strength, toughness, wear resistance, hardenability, and weldability makes Alloy Steel 4130 suitable for CNC-machined components used in aerospace, automotive, industrial, and general engineering applications. It is particularly appropriate for parts requiring a balance of high mechanical performance, relatively low weight, and the ability to be heat treated or welded.

Material Specifications (For reference only.)	
Tensile strength	435MPa
Shear modulus	80GPa
Elongation at Break	25.5%

Hardness	197 HB
Density	7.85 g/cm ³

Attention

Alloy Steel 4130 is available in annealed, normalized, and hardened-and-tempered conditions, and its mechanical properties can vary significantly with heat treatment. When machining hardened material, cutting conditions and tooling should be adjusted accordingly because increased hardness can make machining more difficult. For applications exposed to moisture or corrosive environments, an appropriate protective coating or surface treatment should also be considered.

Applications

3DSPRO finds people using Alloy Steel 4130 to make functional parts and prototypes in the following industries and applications.

Aerospace components:

Aircraft engine mounts, structural fittings, brackets, shafts, and other high-strength mechanical components.

Automotive and motorsports:

Chassis components, suspension parts, shafts, brackets, mounts, and other high-performance mechanical parts.

Industrial equipment:

Gears, shafts, machine components, fasteners, fittings, and other parts requiring a combination of strength, toughness, and wear resistance.

Tubular and general engineering applications:

Welded tubing, mechanical components, fixtures, brackets, and other CNC-machined parts requiring good strength and weldability.