

Material Information



Stainless Steel 410

Introduction

Stainless Steel 410, also known as AISI 410 or UNS S41000, is a hardenable martensitic stainless steel containing approximately 11.5–13.5% chromium. It offers a good combination of strength, hardness, wear resistance, and corrosion resistance, making it suitable for CNC machined components that require higher mechanical performance.

Advantages

Good strength, high hardness after heat treatment, good wear resistance, and moderate corrosion resistance. Stainless Steel 410 can also be readily heat treated to achieve different combinations of hardness, strength, and ductility, making it suitable for highly stressed mechanical components.

Disadvantages

Stainless Steel 410 has lower corrosion resistance than austenitic stainless steels such as 304 and 316, particularly in aggressive or chloride-containing environments. Its machinability can also vary with material condition, with the soft annealed condition tending to produce gummy chips and less favorable machining characteristics.

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, hardness, wear resistance, and moderate corrosion resistance makes Stainless Steel 410 suitable for CNC machined components used in automotive, aerospace, industrial, energy, and general engineering applications. It is particularly appropriate for parts that require high mechanical strength and wear resistance under atmospheric or moderately corrosive conditions.

Material Specifications (For reference only.)	
Tensile strength	310MPa
Shear modulus	73GPa
Elongation at Break	25%

Hardness	147 HB
Density	7.74 g/cm ³

Attention

Stainless Steel 410 is available in annealed, hardened, and tempered conditions, and its mechanical properties can vary substantially with heat treatment. When higher strength or hardness is required, the appropriate hardening and tempering condition should be specified. Heat treatment can also cause dimensional changes, so machining and heat treatment sequences should be considered for precision components.

Applications

3DSPRO finds people using Stainless Steel 410 to make functional parts and prototypes in the following industries and applications.

Automotive parts and supplies:

Valve components, shafts, fasteners, bolts, pins, and other mechanical parts requiring good strength and wear resistance.

Aerospace components:

Fittings, fasteners, shafts, brackets, and other highly stressed components used under atmospheric conditions.

Industrial equipment:

Valve components, pump parts, gears, bushings, machine components, and other precision parts requiring hardness and wear resistance.

Energy and general engineering:

Fasteners, mechanical fittings, blades, bushings, and other CNC machined components requiring a combination of strength, hardness, and moderate corrosion resistance.