

Material Information



Stainless Steel 420

Introduction

Stainless Steel 420 is a martensitic stainless steel known for its high hardness, strength, and wear resistance. It offers good corrosion resistance for many general-purpose applications and can achieve higher hardness through heat treatment. Its combination of hardness, strength, and machinability makes it suitable for precision components, tooling, shafts, valves, and other functional parts.

Advantages

High hardness and strength. Good wear resistance. Good corrosion resistance. Excellent polishability. Good machinability in the annealed condition. Can be heat treated to achieve high hardness and strength.

Disadvantages

Lower corrosion resistance than austenitic stainless steels such as 304 and 316. Machinability decreases after hardening. Heat treatment may cause dimensional changes and requires appropriate process control. Not recommended for highly corrosive environments.

Tolerance

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

Recommendation

Stainless Steel 420 is recommended for functional parts that require high hardness, wear resistance, and moderate corrosion resistance. It is particularly suitable for shafts, valves, gears, bearings, tooling components, surgical instruments, knife components, and other precision-machined parts where hardness and durability are important.

Material Specifications (For reference only.)	
Tensile strength	345MPa
Shear modulus	81GPa
Elongation at Break	25%
Hardness	195 HB
Density	7.8 g/cm ³

Attention

Stainless Steel 420 can achieve significantly different mechanical properties depending on its heat-treatment condition. Machining is generally easier in the annealed condition, while hardened 420 requires appropriate cutting tools and machining parameters. For applications requiring high hardness and tight dimensional tolerances, heat treatment and its potential dimensional effects should be considered during manufacturing planning.

Applications

3DSPRO finds people using Stainless Steel 420 to make functional parts and prototypes in the following industries and applications.

Industrial Equipment:

Shafts, gears, valves, bushings, bearings, wear-resistant components, fixtures, and mechanical hardware.

Automotive:

Valve components, shafts, pump components, fasteners, and other wear-resistant mechanical parts.

Medical:

Surgical instruments, dental instruments, orthopedic tools, and other reusable components requiring hardness and moderate corrosion resistance.

Consumer Supplies:

Knife components, blades, precision hardware, cutting tools, and durable mechanical products.