

Material Information

Stainless Steel 440C



Introduction

Stainless Steel 440C is a high-carbon martensitic stainless steel known for its excellent hardness, wear resistance, and good corrosion resistance. It can achieve high hardness through heat treatment while maintaining good strength and dimensional stability. These properties make 440C suitable for precision components, bearings, valves, tooling, cutting components, and other functional parts that require high wear resistance and durability.

Advantages

Excellent hardness and wear resistance. High strength after heat treatment. Good corrosion resistance for a martensitic stainless steel. Good dimensional stability after appropriate heat treatment. Excellent polishability. Suitable for precision and wear-resistant components.

Disadvantages

Lower corrosion resistance than austenitic stainless steels such as 304 and 316. Machinability decreases significantly after hardening. High hardness can increase cutting forces and tool wear. Heat treatment may cause dimensional changes. 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 440C is recommended for functional parts that require very high hardness, wear resistance, and good corrosion resistance. It is particularly suitable for bearings, valves, shafts, molds, cutting components, surgical instruments, precision mechanical parts, and other applications where surface durability and dimensional stability are important.

Material Specifications (For reference only.)	
Tensile strength	445MPa
Shear modulus	84GPa
Elongation at Break	14%
Hardness	223 HB

Density	7.8 g/cm ³
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Attention

Stainless Steel 440C is generally machined in the annealed condition because its hardness increases substantially after heat treatment. Hardened 440C is considerably more difficult to machine and may cause increased tool wear and cutting forces. For precision components, the manufacturing process should also account for potential dimensional changes associated with heat treatment.

Applications

3DSPRO finds people using Stainless Steel 440C to make functional parts and prototypes in the following industries and applications.

Industrial Equipment:

Bearings, valves, shafts, bushings, molds, wear-resistant components, precision mechanical parts, and tooling components.

Automotive:

Pump components, valve components, shafts, bearings, and other wear-resistant mechanical parts.

Medical:

Surgical instruments, dental instruments, precision medical components, and other reusable parts requiring high hardness and wear resistance.

Aerospace:

Precision mechanical components, valve parts, bearings, shafts, and wear-resistant hardware.

Consumer Supplies:

Knife components, cutting tools, precision hardware, high-wear components, and durable mechanical products.