Material Information

Stainless Steel 304

Introduction

Stainless Steel 304, also known as AISI 304 or UNS S30400, is an austenitic chromium-nickel stainless steel known for its excellent corrosion resistance, good formability, and good weldability. It is one of the most widely used stainless steel grades and can be readily cut, bent, stamped, and formed into a variety of sheet metal components. Stainless Steel 304 is commonly selected when a balance of corrosion resistance, fabrication performance, durability, and appearance is required.

Advantages

Excellent corrosion resistance, good formability, and good weldability make Stainless Steel 304 suitable for a wide range of sheet metal fabrication applications. It can be readily bent, deep drawn, stamped, and formed into complex shapes. The material also maintains good performance in many atmospheric and industrial environments and can be readily fabricated using conventional welding and sheet metal processes.

Disadvantages

Stainless Steel 304 has a relatively high work-hardening rate, which can make extensive forming progressively more difficult and may require appropriate tooling or intermediate annealing for severe forming operations. Its strength is also lower than that of many hardened or precipitation-hardening stainless steels. In environments containing chlorides, 304 may also be susceptible to pitting and stress corrosion cracking under certain conditions.

Tolerance

We offer tolerances as tight as +/- 0.005". Tighter tolerances are available upon manual review.

Recommendation

The combination of excellent corrosion resistance, formability, weldability, durability, and versatile fabrication characteristics makes Stainless Steel 304 suitable for sheet metal fabricated parts used in food processing, kitchen equipment, chemical processing, automotive, architectural, medical, and general industrial applications. It is particularly appropriate for enclosures,

panels, brackets, housings, tanks, and formed components that require reliable corrosion resistance and a durable surface.

Material Specifications (For reference only.)	
Tensile strength	215MPa
Shear modulus	77GPa
Elongation at Break	70%
Hardness	123 HB
Density	8 g/cm^3

Attention

Stainless Steel 304 is a non-heat-treatable austenitic stainless steel, and its strength can be increased through cold working. During bending, stamping, and deep drawing, the material's work-hardening behavior and springback should be considered when selecting tooling and bend parameters. Welding is generally straightforward, but prolonged exposure to temperatures in the sensitization range can reduce corrosion resistance in some conditions. Proper welding procedures and post-processing should therefore be considered for parts intended for corrosive environments. Surface contamination from carbon steel tooling should also be avoided to maintain the corrosion-resistant surface.

Applications

3DSPRO finds people using Stainless Steel 304 to make functional parts and prototypes in the following industries and applications.

Food processing and kitchen equipment:
Food-processing equipment, trays, countertops, sinks, cabinets, housings, panels, and other fabricated components requiring corrosion resistance, cleanability, and durability.

Chemical and industrial equipment:
Tanks, covers, housings, brackets, piping-related components, process equipment, and other sheet metal parts exposed to a variety of industrial environments.

Automotive and transportation:
Exhaust-related components, brackets, shields, panels, enclosures, and other fabricated parts requiring corrosion resistance and good forming performance.

Architectural, medical, and general fabrication:

Enclosures, panels, cabinets, handrails, medical equipment components, decorative parts, brackets, and other sheet metal fabricated components that benefit from Stainless Steel 304's corrosion resistance, formability, and durable appearance.