

Stainless Steel: 1.4016 (430) Sheet and Plate

Description

Stainless steel type 1.4016, commonly referred to as grade 430, is characterized by a combination of favorable properties. Type 430 offers commendable corrosion resistance along with good formability and ductility. This ferritic stainless steel, containing plain Chromium, is non-hardenable and boasts excellent finish quality. Additionally, grade 430 exhibits exceptional resistance to nitric attack, making it particularly suitable for applications in the chemical industry. Its prevalent uses include domestic appliances and decorative trim. The provided property data pertains to flat rolled products in accordance with EN 10088-2:2005. While ASTM, EN, or other standards may govern the products sold, it is reasonable to anticipate that specifications in these standards will align closely, though not necessarily identically, with those presented in this datasheet.

Alloy Designations

Stainless Steel Grade 1.4016/430 is associated with the following designations, although they may not be direct equivalents:

- UNS S43000
- BS 430S17
- EN60

Supplied Forms

This stainless steel grade is available in various forms:

- Sheet
- Strip
- Tube
- Bar
- Fittings & Flanges
- Pipe
- Plate

Applications

430 stainless steel finds typical applications in:

- Low-cost sinks
- Decorative trim
- White & Brown Goods (washing machines, dishwashers, cookers)
- Refrigerators
- Stove element supports
- Scientific apparatus
- Fasteners
- Flue linings

Corrosion Resistance

Type 430 stainless steel exhibits good corrosion resistance to various media, including nitric acid and some organic acids. Optimal corrosion resistance is achieved when it has a highly polished surface. Similar to other ferritic grades, it demonstrates high resistance to stress corrosion cracking.

Heat Resistance

Grade 430 stainless steel shows good resistance to oxidation in intermittent service up to 870°C and in continuous service up to 815°C. Prolonged heating at 400-600°C may lead to brittleness, necessitating annealing.

Fabrication

All stainless steel fabrication should use tools dedicated to stainless steel materials, with thorough cleaning of tooling and work surfaces to prevent cross-contamination, which could discolor the fabricated product.

Cold Working

Stainless steel grade 430 is easily cold-workable, though not as ductile as 304 stainless. Notably, 430 does not work harden to the same extent as 304.

Hot Working

Hot working, such as forging, should follow uniform heating to 816-1038°C. Air cooling to room temperature and subsequent annealing is recommended. Prolonged exposure to forming temperatures should be avoided to prevent excessive grain growth, which could result in an 'orange peel' texture on the surface.

Machinability

Type 430 stainless steel is relatively easy to machine, with the following guidelines:

- Keep cutting edges sharp to prevent excess work hardening.
- Ensure light cuts, deep enough to prevent work hardening.
- Use chip breakers to keep swarf clear of the work.
- Due to low thermal conductivity, ample coolants and lubricants are necessary.

Heat Treatment

Type 430 stainless steel cannot be hardened by heat treatment. Annealing involves heating to 815°C, soaking for 30 minutes per 25mm of thickness, furnace cooling to 600°C, followed by quick air-cooling. Slow cooling from 540-400°C may result in brittleness.

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Weldability

Grade 430 can be readily welded using fusion methods, with recommended preheating to 150-200°C. Annealing at 790-815°C can relieve embrittlement of the heat-affected zone. Depending on the application, recommended filler rods or electrodes include grades 430, 308L, 309, 310, or 312 stainless steels.

Chemical Composition

EN 10088-2:2005. 1.4016 Steel

Element	% Present
Chromium (Cr)	16.00 - 18.00
Silicon (Si)	0.0 - 1.00
Manganese (Mn)	0.0 - 1.00
Carbon (C)	0.0 - 0.08
Phosphorous (P)	0.0 - 0.040
Sulphur (S)	0.0 - 0.02
Iron (Fe)	Balance

Physical Properties

Property	Value
Density	7.75 g/cm ³
Melting Point	1425-1510 °C
Thermal Expansion	10.4 x10 ⁻⁶ /K
Modulus of Elasticity	200 GPa
Thermal Conductivity	23.9 W/m.K
Electrical Resistivity	0.60 x10 ⁻⁶ Ω .m

Mechanical Properties

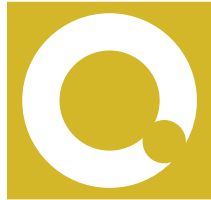
EN 10088-2:2005. Sheet. Up to 8mm Thick

Property	Value
Proof Stress	260 Min MPa
Tensile Strength	450 - 600 MPa
Elongation A50 mm	20 Min %

EN 10088-2:2005. Plate. Over 8mm to 13.5mm / Thick

Property	Value
Proof Stress	240 Min MPa
Tensile Strength	450 - 600 MPa
Elongation A50 mm	18 Min %

Properties listed above are for 1.4016 Sheet / Plate



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Disclaimer

This data serves as an indicative reference and should not be used as a substitute for the full specification. Mechanical properties can vary significantly depending on the temper, product, and its dimensions. All the information provided is based on our current knowledge and is given in good faith. The company bears no responsibility for any actions taken by third parties based on this information.

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