MACSTEEL®

Data Sheet

STAINLESS STEEL | 430 / 430 DDQ TECHNICAL DATA

Description

430 is a low-carbon chromium ferritic stainless steel. This steel has good corrosion resistance in mildly corrosive environments and good resistance to oxidation at elevated temperatures. In the annealed condition the steel is ductile, does not harden excessively during cold work and can be formed using a large variety of roll forming or mild stretch- bending operations.

430 has limited weldability and should not be used in the as-welded condition for dynamic or impact loaded structures. Being a ferritic material, 430 has the potential to suffer brittle fracture at sub-zero temperatures. It should not be used in cryogenic applications.

Equivalents

430 or 430DDQ- S43000, EN 1.4016

Typical Applications

430 is a simple corrosion and heat-resisting grade and finds application in areas where mildly corrosive conditions occur or where scaling resistance at moderate temperatures is required. Typical applications include:

- Automotive trim, architectural applications such as industrial roofing and wall cladding.
- Kitchen and cafeteria utensils and cutlery, sinks, wash troughs, urinals, toilets, trim for domestic equipment.

Chemical composition (EN 10088-2 & ASTM A240)

Grade	%C	%Mn	%P	%S	%Si	%Cr	%Ni
430/ 430DDQ	0.12 max	1.0 max	0.04 max	0.03 max	1.0 max	16.0 - 18.0	0.75 max

Mechanical properties (EN 10088-2 & ASTM A240)

Grade	0.2% proof stress (MPa)	Tensile (MPa)	Elongation (%)	Hardness (HB)
430/ 430DDQ	260 min	460 - 630	20 min	183 max

Short time elevated temperature tensile strength (MPa)

Grade	100°C	200°C	500°C	600°C	800°C	1000°C
430/ 430DDQ	475	450	315	200	55	15

Maximum recommended service temperature

Continuous service: 730°C
Intermitted service: 870°C

General corrosion resistance

430 has good resistance to a wide variety of corrosive environments including nitric acid and some organic acids. It is generally used for highly polished applications and in mild atmospheres such as for food processing and dairy equipment. Atmospheric corrosion resistance is good, although in highly polluted or marine environments staining may occur.

Corrosion Resistance - Aqueous

Temperature °C	20						80					
Concentration -% by mass	10	20	40	60	80	100	10	20	40	60	80	100
Sulphuric Acid	2	2	2	2	2	2	2	2	2	2	2	2
Nitric Acid	0	0	0	0	0	2	0	0	0	1	1	2
Phosphoric Acid	0	0	2	2	2	2	0	0	2	2	1	1
Formic Acid	0	2	2	2	2	1	0	2	2	2	2	0

Key 0 = resistant - corrosion rate less than 0.1µm/year
Key 1 = partly resistant - corrosion rate 0.1 - 1.0µm/year
Key 2 = non-resistant - corrosion rate more than 1.0µm/year

Corrosion Resistance - Atmospheric

The performance of 430 compared with other metals in various environments is shown in the following table – the corrosion rates are based on 10-years exposure.

Environment	Corrosion Rate (µm/year)		
	430	Aluminium-3S	Mild Steel
Rural	0.0025	0.028	4.3
Marine	0.0381	0.424	25.7
Marine-industrial	0.0406	0.546	37.1

Thermal processing

Annealing

Annealed 430 is at its softest and most ductile condition and may be used for cold-working operations. The annealing temperature range is between 760°C and 850°C followed by cooling in air.

Stress relieving

Stress relief after welding is not usually required. Should this be necessary, temperatures between 200°C and 300°C are recommended.

Hot-working

Initial forging and pressing temperature range: 950°C to 1050°C
Finishing temperature below 750°C
Avoid extended holding times above 1000°C as excessive grain growth takes place, which reduces severally ductility.

Note: All hot working operations should be followed by annealing and then pickling and passivation to restore the mechanical properties and corrosion resistance.

Cold working

Standard ferritic stainless steels have fair formability characteristics with useful mechanical properties. Their ductility allows them to be formed by bending and deep drawing. They do not undergo significant work hardening when cold formed.

Welding

The standard ferritic stainless steels are prone to grain growth in the heat-affected zone. As such, the tensile, fatigue and toughness properties in the welded condition are relatively poor. They should thus not be used for applications where tensile or dynamic loading will be experienced.

The use of austenitic filler metals such as types 308L, 309L or 316L will improve the ductility of welds to some extent.