



North American Stainless

Flat Products Stainless Steel Grade Sheet

430 (S43000)/ EN 1.4016

Introduction:

SS430 is a low-carbon plain chromium, ferritic stainless steel without any stabilization of carbon and nitrogen with titanium or niobium. With 16% chromium, the steel has good corrosion resistance in mildly corrosive environments and good oxidation resistance at elevated temperatures. Annealed SS430 is ductile and can be formed using a large variety of roll forming or mild stretch- bending operations as well as the more common drawing and bending operations.

Additionally, SS430 does not harden excessively during cold working.

The steel has limited weldability and should not be used in the as-welded condition for dynamic or impact loaded structures. SS430 can form martensite in the heat affected zone of weldments, which may adversely affect the mechanical properties in these zones. Applications involving welded SS430 are thus generally limited to a maximum thickness of 0.12". Edge welds are not recommended for applications using SS430.

Being a ferritic stainless steel, SS430 is unsuited for use in cryogenic applications as brittle fracture could occur at sub-zero temperatures.

SS430 has excellent polishing characteristics and is therefore used in applications such as architectural trim. SS430 also has good formability and corrosion resistance and this makes it suitable for applications such as catering equipment and kitchen equipment.

Product Range:

Product available in Cold Rolled form up to 60" wide in various thicknesses. This grade is additionally available in Best Bright and Roll On finish.

For inquiry about minimum quantity, specific thickness and tolerances, contact inside sales at NAS.

Certification:

ASTM A240, A480, A666, ASME SA240, SA480, SA666, EN 10088-2.

Chemical Composition :

UNS	ASTM/EN	Carbon	Manganese	Phosphorous	Sulfur	Silicon	Chromium	Nickel
S43000	430/1.4016	0.12 max	1 max	0.04 max	0.03 max	1 max	16-18	0.75 max

Mechanical Properties :

	Tensile Strength min	Yield Strength min	Elongation min	Hardness max
430	65 ksi	30 ksi	22%	89 HRB

PROPERTIES AT ELEVATED TEMPERATURE

The properties quoted below are typical of annealed CS430. These values are given as a guideline only, and should not be used for design purposes.

SHORT TIME ELEVATED TEMPERATURE TENSILE STRENGTH

Temperature (°C)	100	300	500	600	700	800	900	1 000
Tensile Strength (MPa)	475	420	315	200	105	55	30	15
0.2% Proof Strength (MPa)	270	230	180	125	50	40		
Elongation (% in 50mm)	30	30	36	44	81	83	95	100

MAXIMUM RECOMMENDED SERVICE TEMPERATURE

(In oxidising conditions)

Operating Conditions	Temperature (°C)
Continuous	730
Intermittent	870

430 SS should not be used in the temperature range of 450°C and 550°C as embrittlement can occur.

REPRESENTATIVE CREEP & RUPTURE PROPERTIES

Temperature (°C)	Stress (MPa) to Produce 1% Strain		Stress (MPa) to Produce Rupture	
	10 000 hours	100 000 hours	1 000 hours	10 000 hours
500	95	70	175	150
550	55	40	100	75
600	30	20	55	40
650	15	10	35	25
700	10	5	20	15
750	7		10	
800	5		5	

Physical Properties:

Density	7 800kg/m ³
Modulus of Elasticity in Tension	200GPa
Modulus of Elasticity in Torsion	65GPa
Specific Heat Capacity	460J/kgK
Thermal Conductivity: @ 100°C	26.1W/mK
@ 500°C	26.3W/mK
Electrical Resistivity	600ηm
Mean Co-efficient of Thermal Expansion: 0 – 100°C	10.4μm/mK
0 – 315°C	11.0μm/mK
0 – 540°C	11.4μm/mK
0 – 700°C	12.1μm/mK
Melting Range	1 425–1 510°C
Relative Permeability	Ferromagnetic

THERMAL PROCESSING & FABRICATION

ANNEALING

Annealing is achieved by heating to between 760°C and 830°C for 90 minutes per 25mm thickness followed by air quenching. Controlled atmospheres are recommended in order to avoid excessive oxidation of the surface.

STRESS RELIEVING

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

HOT WORKING

Uniform heating of the steel in the range of 950°C to 1050°C is required. The finishing temperature should be below 750°C and the steel should be cooled rapidly between 550°C and 400°C to prevent 475°C embrittlement. All hot-working operations should be followed by annealing, pickling and passivating to restore the mechanical properties and corrosion resistance.

COLD WORKING

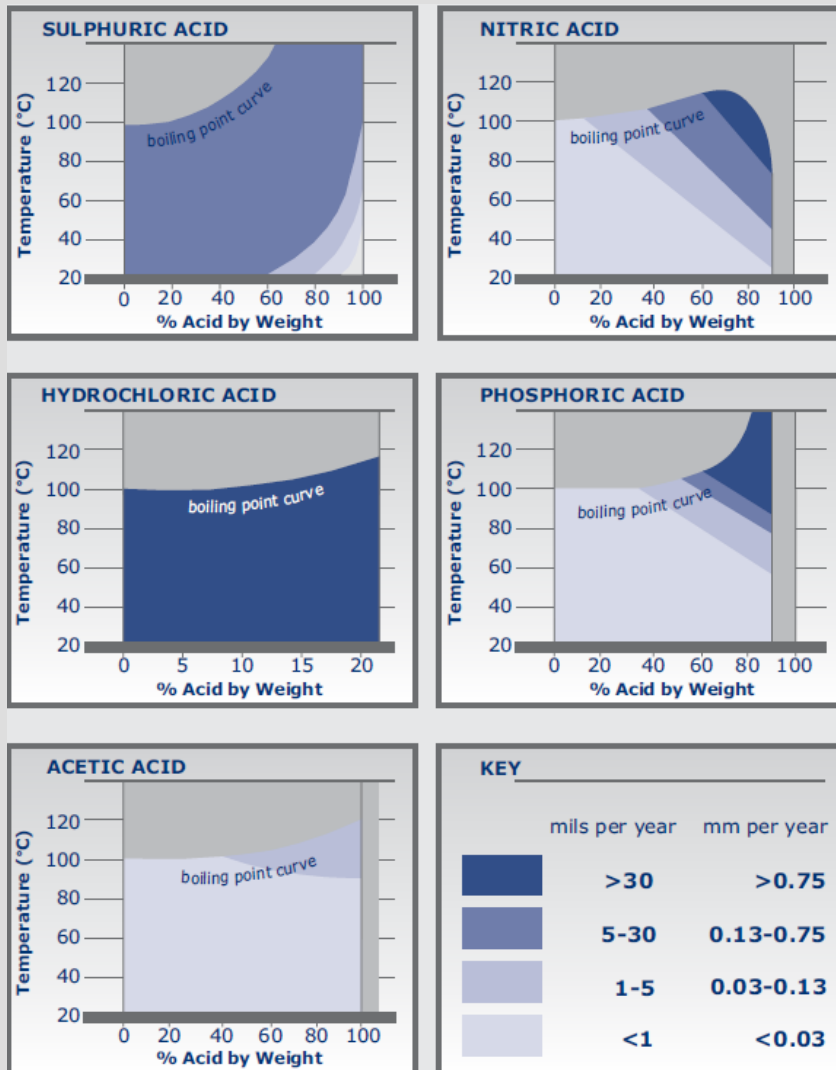
SS430 has good formability characteristics with useful mechanical properties. Its good ductility allows it to be readily formed by bending and deep drawing. SS430 does not undergo significant work hardening when cold formed.

WELDING

SS430 is prone to brittle characteristic in the heat-affected zone of weldments due to formation of martensitic phase. The tensile, fatigue and toughness properties in the welded condition are relatively poor. SS430 should thus not be used for applications where tensile or dynamic loading will be experienced. Edge welds are not recommended for SS430. The use of austenitic filler metals such as types 308L, 309L or 316L will improve the ductility of welds to some extent but all welding procedures should nevertheless endeavor to maintain minimum heat inputs. The weld discoloration should be removed by pickling and passivating to restore maximum corrosion resistance.

CORROSION RESISTANCE

SS430 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.



Technical Service: For further information, email qualitycontrol@northamericanstainless.com

For new product development requirements, contact sales@northamericanstainless.com.

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