

# Stainless Steel Grade 430 / 1.4016

Stainless steel type 1.4016 is also commonly known as grade 430. Type 430 stainless steel combines good corrosion resistance with good formability and ductility.

It is a ferritic, non-hardenable plain Chromium stainless steel with excellent finish quality.

Grade 430 also has excellent resistance to nitric attack, which makes it well suited to use in chemical applications. The most popular applications for 430 are in domestic appliances and decorative trim.

Property data given in this document is typical for flat rolled products covered by ASTM A240/A240M. ASTM, EN or other standards may cover products sold by Aalco. It is reasonable to expect specifications in these standards to be similar but not necessarily identical to those given in this datasheet.

## Applications

Grade 430 stainless steel is typically used in:

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

## Typical Chemical Composition

%	430
C	0.12max
Mn	1.00
Si	1.00
P	0.04
S	0.03
Cr	16-18
Ni	0.75max

## Typical Mechanical Properties

Grade	430
Tensile Strength (MPa)	450
Proof Stress 0.2% (MPa)	205
Elongation A5 (%)	22
Hardness Rockwell B (HR B)	89max

## Typical Physical Properties

Property	Value
Density	7.75 g/cm <sup>3</sup>
Melting Point	1425-1510°C
Modulus of Elasticity	200 GPa
Electrical Resistivity	0.060x10 <sup>-6</sup> Ω.m
Thermal Conductivity	23.9 W/m.K at 100°C
Thermal Expansion	10.4x10 <sup>-6</sup> /K at 100°C

## Alloy Designations

Grade 430 stainless steel also corresponds to the following standard designations and specifications:

Euronorm	UNS	BS	En	Grade
1.4016	S43000	430S17	60	430

## Corrosion Resistance

Type 430 stainless steel has good corrosion resistance to a large variety of media including nitric acid and some organic acids. The corrosion resistance of type 430 is optimal when it has a highly polished surface. As with other ferritic grades, resistance to stress corrosion cracking is very high.

## Heat Resistance

Grade 430 stainless steel has good resistance to oxidation in intermittent service to 870°C and in continuous service to 815°C. After prolonged heating at 400-600°C, type 430 stainless steel may become brittle and require annealing.

## Fabrication

Fabrication of all stainless steels should be done only with tools dedicated to stainless steel materials. Tooling and work surfaces must be thoroughly cleaned before use. These precautions are necessary to avoid cross contamination of stainless steel by easily corroded metals that may discolour the surface of the fabricated product.

## Cold Working

Stainless steel grade 430 is readily cold workable but is not quite as ductile as 304 stainless. The advantage of 430 over 304 is that the 430 does not work harden to the same extent.

## Hot Working

Fabrication methods, like forging, should occur after uniform heating to 816-1038°C. The component should then be air cooled to room temperature and annealed. Grain growth will occur due to prolonged exposure to forming temperatures. This should be avoided as excessive grain growth can cause an 'orange peel' texture on the surface of the material. As grade 430 is commonly used in aesthetic applications, surface finish is extremely important.

## Heat Treatment

Type 430 stainless steel cannot be hardened by heat treatment.

Annealing is done by heating to 815°C, soaking for 30minutes per 25mm of thickness, furnace cooling to 600°C, then quickly air-cooling.

The component will become brittle if slow cooled from 540-400°C.

## Machinability

Type 430 stainless steel is relatively easily machined. Machining can be enhanced if the following rules are adhered to:

- ◆ Cutting edges must be kept sharp. Dull edges cause excess work hardening.
- ◆ Cuts should be light but deep enough to prevent work hardening by riding on the surface of the material.
- ◆ Chip breakers should be employed to assist in ensuring swarf remains clear of the work
- ◆ Low thermal conductivity of austenitic alloys results in heat concentrating at the cutting edges. This means coolants and lubricants are necessary and must be used in large quantities.

## Welding

Grade 430 can be readily welded by all fusion methods but preheating to 150-200°C is recommended. Annealing at 790-815°C can relieve embrittlement of the heat-affected zone.

Depending on the application, recommended filler rods or electrodes are grades 430, 308L, 309 310, or 312 stainless steels.

## Supplied Forms

Stainless steel grade 430 is typically supplied by Aalco as:

- ◆ 2R (BA) finished sheet
- ◆ Polished sheet
- ◆ Square, Rectangular and round tube

