

Chromium Plated Stainless Steel Bars

EN 1.4418, QT 900

A Martensitic-Austenitic stainless steel

Typical analysis	C	Cr	Ni	Mo
%	0,03	16,0	5,0	1,0
Norm	EN 10272/ 10088-3-1.4418 QT 900			
Delivery condition	Quenched and tempered, chromed plated			

Physical properties acc. to EN 10088

Temperature	20° C	100° C	200° C	300° C	400° C
Density kg/dm ³	7,7				
Modulus of elasticity GPa	200	195	185	175	170
Mean coeff. of thermal expansion 20° C - Temp. x10 ⁻⁶ · K ⁻¹	-	10,3	10,8	11,2	11,6
Thermal conductivity W/m · K	15				
Specific thermal capacity J/kg · K	430				
Electrical resistivity Ω · mm ² /m	0,8				

Mechanical properties

Values at room temperature. Impact strength at -30° C

Tensile strength R _m	N/mm ²	900 - 1100
Proof strength R _{p02}	N/mm ²	min 750
Reduction of area Z	%	Min 40
Elongation A ₅	%	Min 16
Hardness	HB	280 - 340
Impact energy K _v at -40° C Longitudinal- and transversal direction	J/cm ²	Min 32

Properties Chrome layer

Chrome thickness	μm	25±5
Surface Roughness Ra	μm	0.05-0.20
Chrome hardness	Hv _{0.1}	900-1100
"_"	HRC	67-70
Tolerance		h9
Straightness	mm	0.2/1000
Roundness	Max.50% of the diameter tolerance interval	

EN 1.4418 is a high strength low carbon martensitic-austenitic stainless steel. It combines high strength with good weldability - properties, which are maintained after welding. **EN 1.4418** is designed for applications in slightly corrosive environments where above mentioned properties are required.

In our stock standard condition the steel matrix consists of appr. 80 % martensite, 10 % austenite and 10 % ferrite.

This composition allows a low carbon martensitic structure after quenching and tempering.

Martensite, some remaining austenite, chrome and molybdenum together contribute to the following characteristic properties:

- ⇒ High tensile strength.
- ⇒ High toughness
- ⇒ Excellent surface corrosion properties
- ⇒ Better corrosion properties than most of the existing stainless martensitic steels.
- ⇒ Very good fatigue resistance.
- ⇒ Wear resistance
- ⇒ Fitness to lubrication

Typical application areas

- Piston rods
- Marine environment
- Extreme climate conditions
- Mining
- Road-going equipment
- Chemicals
- Civil Engineering
- Agricultural machinery
- Off-shore Industry
- Hydraulic and oleodynamic
- Defense
- Aeronautic
- Aerospaceal
- Nuclear

Corrosion Resistance

Resistance to general corrosion of **EN 1.4418** is better than that of common 13 % and 17 % chrome stainless steels. It is similar to that of austenitic stainless steels of 304-type.

The steel appears to its best advantage in slightly to moderately corrosive environments like e.g.:

- Organic acids, acetic acid, citric acid, benzoic acid, stearic acid, pyrogallol acid, tannic acid and uric acid.
- Some inorganic acids e.g. nitric acid and boric acid.
- Salt solutions e.g. carbonates, nitrates and some sulphates.

EN 1.4418 does not show full resistance to crevice corrosion and should therefore among other things not be applied in non agitated seawater without a cathodic protection.

Test corrosion resistance – rating 10 according to ISO 10289.

Neutral fog test (NSS) ISO 9227: + 2100 h

Salt fog test (ASS) ISO 9227: + 700 h

Bar finish

EN 1.4418 QT 900 is available with a chromium plated surface.

Lengths

Production lengths are between 3.0-7.6 m. Standard is 6.1 +0.1/-0m diam from 8 up to Ø 125 mm, 5m + 1m from Ø 130 up to Ø 160 mm. Other lengths up to 8300 mm on request. The "unchromed length" of each bar, i.e. the distance at each end over which the chrome-layer properties and tolerances can not be guaranteed, is depending on dimension 100-150 mm

Packaging

With the extrusion of recyclable polypropylene over the bar. Other package on request (carton tubes, wooden boxes...)

Stock standard

See products /stockstandard:

www.valbrunanordic.se

Welding

The weldability of **EN 1.4418** is better than that of common martensitic stainless steels. This is thanks to the properties of the tempered structure containing low carbon martensite and finely dispersed austenite. Welding should preferably be made using Avesta Sheffield 248 SV welding consumables. Austenitic material of T316L type can be used provided lower tensile strength of the weld is allowed.

Preheating is normally not necessary except for heavy structures and in special cases. Heat treatment after welding is normally not necessary. After welding using welding consumables similar to the parent material a tempering at 580 - 590°C is recommended.

Technical service

VALBRUNA NORDIC AB will be helpful in giving further advice and recommendations concerning choice of materials, welding, heat treatment etc.

MATERIAL STANDARDS

SS-EN 10088-3	Stainless steels-Semi-finished products, bars, rods, sections for general purposes
SS-EN 10272	Stainless steel bars for pressure purposes
ASTM A 276/ ASME SA-276	Stainless steel bars for general purposes