outokumpu
stainless steel & high performance alloys

EN 1.4622 - 21% Cr Ferritic Stainless Steel

Introduction

Outokumpu EN 1.4622 ferritic stainless steel with its high chromium content improves corrosion resistance, which makes it ideal for wide range of applications such as catering, household and architectural applications, as wells as in tubular products for the automotive and process industries.

Ferritic stabilized stainless steel

Type X2CrTiNbVCu22 stainless steel:
EN 1.4622* fulfills UNS S44330
*Designation according to Stahl Eisen Liste (register of European Steels)

Applications

High chromium content makes this grade appropriate for replacing standard austenitic grades in many applications:
- catering and household products
- architectual applications both indoors and outdoors
- Tubular products for automotive industry
- Process equipment such as heat exchangers

Corrosion resistance

Outokumpu produces grade EN 1.4622 typically with a chromium content of about 21 wt-%.
- Stabilization reduces sensitivity for intergranular corrosion.
- High chromium content improves corrosion resistance, which is similar compared to some other stainless steels, like austenitic 1.4307.
- In chloride containing environments pitting and crevice corrosion is possible depending on various parameters like chloride concentration, temperature, pH value, redox potential, crevice geometry and others.
- Grade EN 1.4622 is not susceptible to chloride induced stress corrosion cracking.
- The best material performance is reached usually with the help of adequate design, correct post-weld treatment and regular cleaning during use (if applicable).

Forming and machining

The grade can be formed using typical forming processes like folding, bending, drawing, etc.
- Grade has slightly higher proof strength than standard austenitic stainless steel grade 1.4301 / AISI 304 in combination with lower work hardening.
- Due to the stabilization, its r-value is higher compared to non-stabilized ferritic stainless steel.
- These characteristics mean excellent deep-drawability.

Welding

Conventional welding methods are applicable, austenitic 316L filler metals can be used.
- Shielding gases should be Ar/He based, mixed with maximum of 2% oxygen to improve the arc stability. Hydrogen and nitrogen additions are forbidden.
- Heat input should be minimized to reduce the grain growth in the heat-affected zone.
- Stabilization prevents sensitization in the welds.
- Adequate corrosion resistance in the welds is achieved by using either mechanical descaling or pickling.

Physical properties

Crystal structure is ferritic, and therefore material is ferromagnetic as soft annealed condition.
- Density: 7,7 g/cm^3
- Coefficient of thermal expansion: 10x10^{-6} 1/K (T = 20...100°C)
- Thermal conductivity at 20°C: 25 W/(m x K)
- Modulus of elasticity: 220 GPa

Mechanical properties (typical)

- For cold rolled materials.

	Grade	Proof strength $R_{p0,2}$ (N/mm²)	Tensile strength R_m (N/mm²)	Elongation after fracture A (%)
EN	1.4622	360	470	30

Chemical composition (typical)

EN	C wt-%	Cr wt-%	Mn wt-%	Ni wt-%	Ti+Nb wt-%	Fe wt-%
1.4622	0,02	21	0,4	-	0,4	Bal.

Product specifications and approvals

The steel grade fulfills ASTM UNS S44330 requirements. Work is in progress for EN standardization.

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