EN 1.4318, AISI 301LN

Product Information
April, 2009

Austenitic stainless steel

Type X2CrNiN18-7 stainless steel:
EN 1.4318, AISI 301LN, low carbon, high nitrogen

Applications

- Generally used for structural parts where high strength and toughness are needed beside a corrosion resistance similar to grade 1.4301 / AISI 304.
- When hardened by cold working (surface finish 2H or TR), the strength and corrosion resistance of this steel grade steel is utilized in structural applications, like in transportation vehicles.
- The combination between ductility and toughness is excellent even at low temperatures.

Welding

- Weldability is good. The thermal expansion is 1,5-times larger compared with carbon steels.
- Chromium and nickel contents of the filler metal have to match or to be higher than the composition of the base metal, e.g. type 19-9.
- Cleaning the weld seam has a significant importance for corrosion resistance. Pickling is recommended.

Forming and machining

- Work hardening is pronounced due to high work hardening rate and formation of martensite in the range of larger deformations.
- Formability is good, thus forces needed and the elastic return is bigger compared with carbon steels and even when compared with grade 1.4301 / AISI 304.
- Because of high ductility and work hardening it is recommended to use sharp cutting tools and an effective cooling and adequate feed of tool when machined.

Corrosion resistance

- Corrosion resistance is comparable to grade 1.4301 / AISI 304.
- Resistance to atmospheric corrosion is adequate for several applications. Special attention should be paid on surface finish and regular cleaning procedures in marine and industrial environments.
- In chloride containing solutions pitting and crevice corrosion is possible depending on various parameters like chloride concentration, temperature, pH value, redox potential, crevice geometry and others.
- When the temperature of chloride containing solutions exceeds 50°C and the construction is loaded, stress corrosion cracking is possible.
- The best material performance is reached usually with the help of adequate design, correct post-weld treatment and regular cleaning during use (if applicable).

Physical properties

- Austenitic crystal structure, non-magnetic as soft annealed. Becomes easily magnetic when deformed.
- Density 7,9 g/cm^3.
- Coefficient of thermal expansion 16x10^{-6}1/K (T = 20…100°C)
- Thermal conductivity at 20°C is 15 W/(m x K).

Mechanical properties

- According to EN 10088-2:2005

	Grade	Proof strength $R_{p0,2}$ (N/mm^2)	Tensile strength R_m (N/mm^2)	Elongation after fracture A (%)
EN	**1.4318**	Min. 350	650...850	Min. 35
ASTM	**301LN**	Min. 240	Min. 550	Min. 45

Designation	Tensile strength R_m (N/mm^2)
C700	700…850
C850	850…1000
C1000	1000…1150
C1150	1150…1300

- Tensile strength levels in cold worked condition (2H) according to EN 10088-2:2005.

- Values of cold worked steel AISI 301 according to the standard specification ASTM A666-03.

Cold worked condition	Yield strength (MPa)	Tensile strength (MPa)	Elongation after fracture A (%)
1/16 Hard	Min. 345	Min. 690	Min. 40
1/8 Hard	Min. 415	Min. 760	Min. 35
1/4 Hard	Min. 515	Min. 825	Min. 25
1/2 Hard	Min. 690	Min. 930	Min. 20

- Minimum values of 0,2 % proof strength ($R_{p0,2}$, N/mm^2) at elevated temperatures, EN 10088-2:1995.

EN	100	150	200	250	300	350
1.4318	265	200	185	180	170	165

Chemical composition (typical)

EN	C wt-%	Cr wt-%	Ni wt-%	N wt-%	Fe wt-%
1.4318	Max. 0,030	17,5	6,5	0,14	Bal.

Further information

- Standard Specification EN 10088-2:2005
- Standard Specification ASTM A 240 - 08
- Technical Customer Service

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