



DUPLEX STAINLESS STEEL ACX 900	
EN DESIGNATION	ASTM DESIGNATION
1.4462	2205
X2CrNiMoN22-5-3	S31803 / S32205

DESCRIPTION | ACX 900 is a duplex stainless steel having a microstructure with a phase balance of approximately 50% ferrite and 50% austenite, so it combines the best properties of these two constituents. Furthermore, the dual microstructure is responsible of its outstanding mechanical and corrosion resistant behaviour.

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cr	Ni	Mo	N
≤0.030	≤1.00	≤2.00	≤0.030	≤0.015	22.00-23,00	4.50-6.50	3.00-3.50	0.14-0.20

APPLICATIONS

- Chemical, petrochemical, paper and mining industry
- Storage tanks and tube piping
- Desalination and waste water treatment plants
- Heat exchangers
- Storage tanks and tubes in ships
- Civil work

MECHANICAL PROPERTIES
EN 10088-2
EN 10028-7

	C	H	P
Rp_{0.2}	≥500 N/mm ²	≥460 N/mm ²	≥460 N/mm ²
Rm	700 - 950 N/mm ²	700 - 950 N/mm ²	640 - 840 N/mm ²
Elongation	≥ 20%	≥ 25%	≥ 25%

C = Cold rolled sheet
H = Hot rolled sheet
P = Plate

PHYSICAL PROPERTIES
EN 10088-1

At 20°C it has a density of 7.8 kg/dm³ and a specific heat of 500 J/kg·K

	20°C	100°C	200°C	300°C
Modulus of elasticity (GPa)	200	194	186	180
Mean coefficient of linear expansion between 20°C (10⁻⁶ x K⁻¹) and	-	13	13.5	14
Thermal conductivity (W/m·K)	15	-	-	-
Electrical resistivity (Ω·mm²/m)	0.80	-	-	-

WELDING

ACX 900 can be welded using most of the conventional methods, as stick welding, TIG, MIG, SAW, laser, etc. It is resistant to hot cracking , grain coarsening embrittlement and matensite formation.

The use of nickel-enriched filler material (needed in most cases) and specific process conditions for a controlled cooling are required to obtain correct microstructural and chemistry balances. This will provide a welded area with optimum mechanical, toughness and corrosion resistance properties.

Relatively high thermal inputs can be used as well as shielding gas on both sides of the weld (argon or argon plus helium are normally used). In case of autogenous welding, shielding gas containing nitrogen is recommended as this helps limiting the ferrite content in the weld.



CORROSION RESISTANCE

ACX 900 exhibits an excellent corrosion resistance due to its chromium, molybdenum and nitrogen content.

GENERAL CORROSION

ACX 900 presents corrosion rates lower than 0.10 mm/year when is in contact with:

- 100% acetic acid at 80°C.
- 90% formic acid at 10°C.
- 86% phosphoric acid at 85°C.
- 65% nitric acid at 70°C.
- 30% sulphuric acid at 20°C.
- 70% tartaric acid at boiling temperature.
- 30% Sodium hydroxide at 100°C.
- Toluene.
- Beer.
- Milk.
- Wine.
- Fuel.

PITTING CORROSION

In order to estimate in a theoretical way the stainless steel pitting corrosion resistance, the Pitting Resistance Equivalent, PRE, is used. One of the most extended formulas to calculate the PRE value is:

$$PRE = \%Cr + 3,3 (\% Mo) + 30 (\% N)$$

The higher the PRE, the better the pitting corrosion resistance. ACX 900 has a PRE average value of 38, being in theory more resistant than ACX 250, with an average value of 25.

STRESS CORROSION CRACKING

ACX 900 is less susceptible to this kind of corrosion than austenitic stainless steels.

ATMOSPHERIC CORROSION

ACX 900 performs very well in almost all kind of media. In marine environments it presents better corrosion resistance than ACX 250.

SURFACE CLEANING

Wash the surface with neutral soap and water applied with a cloth or a brush without scratching the stainless steel. Then, always rinse the stainless steel with water to remove completely the cleaning agent. Finally, it is recommended to dry the surface to preserve a good superficial condition. In severe environments, a frequent cleaning is strongly recommended.

SPECIFICATIONS

It can be delivered according to EN 1.4462 from EN 10088-2 and EN 10028-7, and also S31803 y S32205 from ASTM A-240 standard requirements.