



MATERIAL No.: S31803 / 1.4462

DESCRIPTION

EN symbol (short)	X2CrNiMoN 22-5-3	Density kg/dm³	7,8
AISI	AISI 316 LN	Hardness HB 30	<=270
UNS	S 31803 Grade TP 316 LN	Composition	chromium nickel molybdenum steels
AFNOR	X2CrNiMoN 22-5-3 / NF EN 10088-5 (03/2009) (FR)	Category	Corrosion resisting steels and alloys
BS	X2CrNiMoN 22-5-3 / B.S EN 10088-5 (03/2009) (GB)	Structure	duplex (ferritic/austenitic)
Registered work's label	*Cronifer® 2205 LCN Duplex Cr 22 (Spec)	Corrosion	resistant to intergranular corrosion sati factionary against pitting corrosion
		Additional characteristics	No translation!

Description This material shows high resistance to pitting corrosion and intergranular corrosion additionally to great firmness.

CHEMICAL COMPOSITION

		C	Mn	P	S	Cr	Mo	Si	Ni	N
1.4462	Min %					21,00	2,50		4,50	0,100
	Max %	0,030	2,00	0,035	0,015	23,00	3,50	1,00	6,50	0,220
(Key to steel 2010)										
AISI 316 LN	Min %					16,00	2,00		10,00	0,10
	Max %	0,035	2,00	0,040	0,030	18,00	3,00	0,75	15,00	0,16
ASTM A 249 (TP 316 LN)										
S 31803	Min %					21,00	2,50		4,50	0,08
	Max %	0,030	2,00	0,030	0,020	23,00	3,50	1,00	6,50	0,20
ASTM A 790 (S 31803)										

PHYSICAL PROPERTIES

Property		Value			
Density: kg/dm³		7,8			
Hardness: HB 30		<=270			
Brinell		290 (S 31803-ASTM A 790)			
Hardness Rockwell C		30,5 (S 31803-ASTM A 790)			
magnetizable		yes			
polishable		yes			
Temperature T °C/F (°C/F)	Specific heat J / kgK (Btu / lb °F)	Thermal conductivity W/mK (Btu-in / ft ² ·h·°F)	Electric resistance μΩ · cm (Ω circ mill / ft)	Modulus of elasticity kN/mm ² (10 ³ ksi)	Expansion rate from 70°F bis T 10 ⁻⁶ / K (10 ⁻⁶ / °F)
20 / 68	450 (-)	17 (-)	0,77(-)	200 (-)	13,0 (-)
100 / 212				194 (-)	13,5 (-)
200 / 392				186 (-)	14,2 (-)
300 / 572				180 (-)	14,6 (-)
Temperature		1,0% Yield strength		0,2% Yield strength	
		in high temperatures		in high temperatures	
°C / °F		Rp 1,0		Rp 0,2	
		N/mm² / ksi		N /mm² /ksi	
100 / 212		410 / 59,4		360 / 52,2	
200 / 392		350 / 50,7		310 / 44,9	
250 / 482		335 / 48,6		295 /42,8	
300 /572		320 / 46,4		280 /40,6	

MECHANICAL PROPERTIES (20°C / 68°F)

Yield strength (0,2%) (N/mm²-min./ ksi)	450 / 65,2	
Yield strength 1% N/mm² min.	500 / 72,5	
Yield strength ksi (Mpa)	65 /(450)	(S 31803-ASTM A 790)
Tensile strength Rm N/mm² /ksi)	680-880 /98,0-127	cold strip 660/950
Tensile strength ksi (Mpa)	90 /(620)	(S 31803-ASTM A 790)
Elongation in 2 in or 4D (min.%)	25	
Elongation min.%	25	in 2 in.or 50mm (S 31803-ASTM A 790)
impact work ISO-V -J	100	

TEMPERATURE INFORMATION

Application area

Operation temperature	14 °F to 536 °F	475 ° (sigma phase embrittlement)
Solution heat treatment		
Working temperature	1832 °F to 2048 °F	
Processing information	cool down:water; air; blanket gas	
Solution heat treatment		
Working temperature	2102 °F to 1562 °F	
Processing information	cool down:air	
hardness		
Working temperature	1868 °F to 2012 °F	
Processing information	air / water	

STANDARDS / INFORMATION

Standards	Description
ASTM A 182	Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service
ASTM A 240	sheet metal and ribbons from stainless Cr and Ni pressure containers
ASTM A 276	Rods and cross-sections made of stainless and heat-resistant steel
ASTM A 790	Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Pipes
DIN EN 10296-2 (02/2006)	welded circular steel pipes for machine construction and general technical applications, stainless steel
SEW 310 (08/1992)	physical properties of steel
SEW 400 (1997-02)	Rolled and forged stainless steels

PROCESS INFORMATION

Cold forming	heat treatment not necessary if degree of deformation <10%
Chip removing process	doesn't tend to smear
Welding	
- Material classification acc. CEN ISO/TR 15608	10,1
- Type	well weldable Laser welding No translation!

- Add. material	1.4462
- Hints	No translation!

MAIN FIELDS OF APPLICATION

Details of application	for use in: high temperature chloride contaminated water; sea water; brackish water: deteriorating solid matters; sour gas -Petrochemistry; ocean engineering -polishable
Certifications	hardness conforms to NACE MR0175
Chemical Industry	
Apparatus engineering	
cellulose/paper industry	
offshore plants	Sea water desalination plant
Environmental technology	clarification plants
food processing industry	
crude oil	

RANGE OF PRODUCTS

Product type	Product
Processing / Construction	from sheets from pipes, fittings, flanges (welded) from bar steel (turning, milling)
Plates / Sheets	plates/sheets plate/sheet cuts
Fittings	Welded T-pieces seamless elbows seamless reductions seamless T-pieces Other Fittings a.o. Weldolets, Nipples
Flanges / Collars / Flared tube ends	flared tube end collars various flanges (weld neck flange, blind flange etc.) weld neck flange/blind flange
Bumped boiler ends / caps / round blanks	from sheets from bar steel
Pipes / Tubes	welded pipes/tubes welded square pipes/tubes

	Hollow bar seamless pipes/tubes
Round bar	rolled forged raw
Bar steel	flat steel section steel

[Pipe/Tube/Fitting/Flange/Valve/Plate](#)

Stainless Steel/Nickel Alloy/Duplex

