



MATERIAL No.: 1.4539

DESCRIPTION

EN symbol (short)	X1NiCrMoCu 25 20 5	Density kg/dm³	8,05
Alloy	904 L	Hardness HB	<= 230
UNS	N 08904	Composition	Nickel Chrome Molybdenum steel
AFNOR	X1NiCrMoCu 25 20 5 / NF EN 10088-1 (06/2005) (FR)	Category	Corrosion resisting steels and alloys
BS	X1NiCrMoCu 25 20 5 /BS EN 10088-1 (06/2005) (GB)	Structure	austenitic
		Corrosion	resistant to intercrystalline corrosion high resistance to pitting corrosion, tensile corrosion, crevice corrosion
		Additional characteristics	chemically resistant
Description	Usually used in highly corrosive substances.		

CHEMICAL COMPOSITION

		C	Mn	P	S	Cr	Mo	Si	Ni	Cu	N	Fe
1.4539	Min %					19,00	4,00		24,00	1,20		
	Max %	0,02	2,00	0,030	0,010	21,00	5,00	0,70	26,00	2,00	0,150	
(Key to steel 2010)												
alloy 904 L	Min %					19,00	4,00		23,00	1,00		balance
	Max %	0,02	2,0	0,045	0,035	23,00	5,00	1,00	28,00	2,00		balance
ASTM B 677 (UNS 08904)												

PHYSICAL PROPERTIES

Property	Value											
Density: kg/dm³	8,05											
Hardness: HB	<= 230											
Rockwell Hardness Number max.	B 90 (N 08904-ASTM A 249)											
Temperature	Specific	Thermal			Electric			Modulus of		Expansion rate from		

T °C/F (°C/F)	heat J / kgK (Btu / lb °F)	conductivity W/mK (Btu·in / ft ² ·h·°F)	resistance μΩ · cm (Ω circ mill / ft)	elasticity kN/mm ² (10 ³ ksi)	70°F bis T 10 ⁻⁶ / K (10 ⁻⁶ / °F)
20 / 68	450 / (-)	12 / (-)	1,0 /(-)	195 (-)	
100 / 212				190 (-)	15,8 / (-)
200 / 392				182 (-)	16,1 / (-)
300 / 572				174 (-)	16,5 / (-)
400 / 752				166 (-)	16,9 / (-)
500 / 932				158 (-)	17,3 / (-)
Temperature	0,2% Yield strength in high temperatures		1,0% Yield strength in high temperatures		
°C / °F	Rp 0,2		Rp 1,0		
	N/mm² / ksi		N/mm² / ksi		
100 / 212	205 / 29,73		235 / 34,00		
200 / 392	175 / 25,38		205 / 29,73		
300 / 572	145 / 21,00		175 / 25,38		
400 / 752	125 / 18,10		165 / 23,93		
500 / 932	110 / 15,95		140 / 20,30		

ksi value calculated

MECHANICAL PROPERTIES (20°C / 68°F)

Yield strength 0,2% offset min.N/mm² / (ksi)	220 / 31	(solution annealed)	(N 08904-ASTM A 249)
Tensile strength min (N/mm²) (ksi)	490 / 71	(solution annealed)	
Tensile strength min.ksi (Mpa)	71 / (490)	(solution annealed)	(N 08904-ASTM A 249)
Elongation min.%	35	(solution annealed	
Elongation min.%	35	in 2 in.or 50 mm (solution annealed)	(N 08904-ASTM A 249)
impact work ISO-V (J)	60		transverse

TEMPERATURE INFORMATION

Application area	
Operation temperature	°F to 662 °F
Working temperature	1940 °F to 2084 °F
Explanation report	duration 5 min per 5 mm width

Solution heat treatment	
Working temperature	2102 °F to 1742 °F
Explanation report	cool down:air/Water

STANDARDS / INFORMATION

Standards	Description
DIN EN 10216-5 (11/2004+B1) /	seamless steel pipes under compression load made from stainless steels
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 249	Standard Specification for Welded austenitic steel boiler, Superheaters, heat-exchangers, and condenser Tubes
ASTM A 276	Rods and cross-sections made of stainless and heat-resistant steel
ASTM A 312	Standard Specification for Seamless and welded austenitic stainless steel pipes
ASTM B 366	Standard Specification for Factory-Made Wrought nickel and nickel alloy fittings
ASTM B 673	Standard Specification for Welded Pipe
ASTM B 674	Standard Specification for Welded Tube
ASTM B 677	Standard Specification for UNS N08904, N08925 and N08926 Seamless Pipe and Tube
DIN EN 10028-7 (02/2008)	flat products made from steel for pressure tanks Part 7: Stainless steel
DIN EN 10088-1 (09/2005)	Stainless steels Part 1: List of stainless steels
DIN EN 10088-3 (09/2005)	stainless steels. Technical delivery conditions for semi-finished products, bars, rods, wire selection and bright products of corrosion resisting steels for general and construction purposes
DIN EN 10088-4 (08/2009)	stainless steel. Building industry: Technical transport conditions for corrosion resistant sheet metal and ribbons
DIN EN 10217-7 (05/2005)	Welded steel tubes under compression load. Stainless steel tubes

PROCESS INFORMATION

Chip removing process	tendency to cold work hardening
Welding	
- Material classification acc. CEN ISO/TR 15608	8.2
- Type	well weldable with all techniques
- Add. material	1.4519; 2.4653
- Hints	interpass temperature must not go over 302°F

special post heat treating not required

MAIN FIELDS OF APPLICATION

Details of application

Certifications EN 10204 3.1 or 3.2

Chemical Industry for processing sulfuric acid (e.g. sulfuric acid coolers)
for processing phosphoric acid
for the production of salt acid

cellulose/paper industry

Flue gas desulphurization plants

offshore plants Sea water desalination plant

Fertilizer industry

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 reductions
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
seamless pipes/tubes

Round bar

forged raw

Bar steel

flat steel
section steel

round bar steel
hexagon steel

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

Stainless Steel/Nickel Alloy/Duplex

