



**MATERIAL No.: 317LN/ S31726/ 1.4439**

**DESCRIPTION**

<b>EN symbol (short)</b>	X2CrNiMoN17-13-5	<b>Density kg/dm<sup>3</sup></b>	8,1
<b>Alloy</b>	Alloy 317 LN	<b>Hardness HB (&lt;=35mm)</b>	<=350
<b>UNS</b>	S 31726 Grade TP 317 LN	<b>Rockwell Hardness Number max.</b>	B90 (S 31726-ASTM A 249)
<b>AFNOR</b>	X2CrNiMoN17-13-5 / NF E.N 10088-1(06-2005) (FR)	<b>Composition</b>	chromium nickel molybdenum steels
<b>BS</b>	X2CrNiMoN17-13-5 / B.S. E.N 10088-1(06-2005) (GB)	<b>Category</b>	Corrosion resisting steels and alloys
		<b>Structure</b>	austenitic
		<b>Corrosion</b>	resistant to intercrystalline corrosion < 400°C non-corroding
		<b>Additional characteristics</b>	chemically resistant

**CHEMICAL COMPOSITION**

		C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N
<b>1.4439</b>	<b>Min %</b>						16,50	4,00	12,50		0,12
	<b>Max %</b>	0,03	1,00	2,00	0,045	0,015	18,50	5,00	14,50		0,22
(Key to steel 2010)											
<b>Alloy 317 LN S 31726</b>	<b>Min %</b>						17,00	4,00	13,50		0,10
	<b>Max %</b>	0,03	1,00	2,00	0,040	0,030	20,00	5,00	17,50	0,75	0,20
ASTM A 312 (S 31726)											

**PHYSICAL PROPERTIES**

Property	Value
<b>Density: kg/dm<sup>3</sup></b>	8,1
<b>Hardness: HB</b>	<=350

<b>(&lt;=35mm) Rockwell Hardness Number max.</b>		B90 (S 31726-ASTM A 249)			
<b>magnetizable</b>		no			
<b>polishable</b>		good			
<b>Temperature T °C/F (°C/F)</b>	<b>Specific heat J / kgK (Btu / lb °F)</b>	<b>Thermal conductivity W/mK (Btu·in / ft<sup>2</sup>·h·°F)</b>	<b>Electric resistance μΩ · cm (Ω circ mill / ft)</b>	<b>Modulus of elasticity kN/mm<sup>2</sup> (10<sup>3</sup> ksi)</b>	<b>Expansion rate from 70°F bis T 10<sup>-6</sup> / K (10<sup>-6</sup> / °F)</b>
20 / 68	0,50 (--)			200 (--)	16,5 (--)
100 / 212					17,5 (--)
200 / 392					17,5 (--)
300 / 572					18,5 (--)
400 / 752					18,5 (--)
500 / 932					
<b>Temperature</b>		<b>1%Yield strength in high temperatures</b>		<b>Tensile strenght in high temperatures</b>	
<b>°C / °F</b>		<b>Rp 1,0</b>		<b>Rm</b>	
		<b>N/mm<sup>2</sup> / ksi</b>		<b>N/mm<sup>2</sup> /ksi</b>	
100 / 212		255 / 37,00		520 / 75,40	
200 / 392		210 / 30,45		460 / 66,70	
300 / 572		190 / 27,55		440 / 63,80	
400 / 752		175 / 25,40			
ksi value calculated					

#### MECHANICAL PROPERTIES (20°C / 68°F)

<b>0,2% Yield strength Rp 0,2 (N/mm<sup>2</sup>)/(ksi)</b>	>285 />41,3		
<b>Yield strength (ksi) /( Mpa)</b>	35/ 250		S 31726-(ASTM A 249)
<b>1%Yield strength Rp 1,0(N/mm<sup>2</sup>) / (ksi)</b>	>315 /> 45,7		
<b>Tensile strength Rm (N/mm<sup>2</sup>) /(ksi)</b>	580-800 / 72,5-116		
<b>Tensile strength ksi (Mpa)</b>	80 / (550)		S 31726-(ASTM A 249)
<b>Elongation A5 (%)</b>	<=20	<=35mm-lengthwise	
<b>Elongation min.%</b>	35		S 31726-(ASTM A 249)

<b>impact work ISO-V (J)</b>	>85
<b>E-Module (Mpa)</b>	200 000

#### TEMPERATURE INFORMATION

<b>Application area</b>	
<b>Operation temperature</b>	-454 °F to 752 °F temperature limit
<b>Explanation report</b>	-454°F only in strain situation III
<b>Solution heat treatment</b>	
<b>Working temperature</b>	1940 °F to 2084 °F
<b>Processing information</b>	cool down:water/air
<b>Working temperature</b>	1760 °F to 1904 °F
<b>Explanation report</b>	>= 30 min.
<b>Processing information</b>	cool down:air
<b>Solution heat treatment</b>	
<b>Working temperature</b>	1562 °F to 2066 °F
<b>Processing information</b>	cool down:water/air

#### STANDARDS / INFORMATION

<b>Standards</b>	<b>Description</b>
<a href="#">ASTM A 182</a>	Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service
<a href="#">ASTM A 213</a>	Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes
<a href="#">ASTM A 249</a>	Standard Specification for Welded austenitic steel boiler, Superheaters, heat-exchangers, and condenser Tubes
<a href="#">ASTM A 269</a>	Standard Specification for Seamless and welded, austenitic, and stainless steel tubing for general purposes
<a href="#">ASTM A 312</a>	Standard Specification for Seamless and welded austenitic stainless steel pipes
<a href="#">ASTM A 403</a>	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings
<a href="#">ASTM A 479</a>	Rods and cross-sections made of stainless and heat-resistant steel used in boilers and other pressure tanks
<a href="#">DIN EN 10088-1 (09/2005)</a>	Stainless steels Part 1: List of stainless steels
<a href="#">DIN EN 10088-3 (09/2005)</a>	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
<a href="#">DIN EN 10217-7</a>	Welded steel pipes under compression load Pipes made from stainless steel
<a href="#">DIN EN 10296-2 (02/2006)</a>	Welded circular steel pipes for machine construction and general technical service stainless steel
<a href="#">DIN EN 10297-2 (02/2006)</a>	Welded circular steel pipes for machine construction and general technical service stainless steel. Pipes made from stainless steel

#### **PROCESS INFORMATION**

<b>Cold forming</b>	Heat treatment generally not required
<b>Welding</b>	
<b>- Material classification acc. CEN ISO/TR 15608</b>	<b>8.1</b>
<b>- Type</b>	well weldable protective gas resistance welding manual arc welding (E)
<b>- Add. material</b>	1.4440

#### **MAIN FIELDS OF APPLICATION**

<b>Details of application</b>	durable in high chlorine concentrations and temperatures
<b>Certifications</b>	
<b>Chemical Industry</b>	for processing phosphoric acid
<b>petrochemical industry</b>	
<b>offshore plants</b>	Sea water desalination plant
<b>cellulose/paper industry</b>	different components

#### **RANGE OF PRODUCTS**

<b>Product type</b>	<b>Product</b>
Plates / Sheets	plates/sheets plate/sheet cuts
Fittings	welded elbows welded reductions Welded T-pieces seamless elbows seamless reductions seamless T-pieces

Bumped boiler ends / caps / round blanks	from bar steel
Pipes / Tubes	welded pipes/tubes seamless pipes/tubes
Bar steel	flat steel round bar steel

Pipe/Tube/Fitting/Flange/Valve/Plate

Stainless Steel/Nickel Alloy/Duplex

