

Quality	X10CrNi18-8	Austenitic	<i>Technical card 2018</i>
Number	1.4310	Stainless Steel	Lucefin Group

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%	N%	
	max	max	max	max		max		max	
0,05-0,15	2,00	2,00	0,045	0,015	16,0-19,0	0,80	6,0-9,5	0,10	EN 10088-3: 2014
+ 0.01	+ 0.10	+ 0.04	+ 0.005	+ 0.003	± 0.2	± 0.05	± 0.1	+ 0.01	

Product deviations are allowed

Temperatur °C

Melting range	Hot-forming	Solution annealing (Solubilization) +AT	Stabilizing	Soft annealing +A	MMA welding - AWS	Electrodes
1435-1400	1250-1150	1120-1000 water	not necessary	not suitable	pre-heating	post welding
					not necessary	slow cooling
Sensitization	Quenching +Q	Tempering +T	Stress-relieving +SR		joint with steel	
avoid slow heating in the range of 420 and 800	not suitable	not suitable	400-250		carbon	CrMo alloyed stainless
					E309-E308	E309-E308 E308
					cosmetic welding	E308
					E308	

Chemical treatment - Passivation 20 - 50% HNO₃ hot or cold

Mechanical properties

Heat-treated material EN 10088-3: 2014 in conditions 1C, 1E, 1D, 1X, 1G, 2D

size	Testing at room temperature							
mm	R	Rp 0.2	A%	A%	Kv ₂ +20 °C	Kv ₂ +20 °C	HBW ^{a)}	
from to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	max	
40	500-750	195	40	-	-	-	230	+AT solubilization

^{a)} for information only (L) = longitudinal (T) = transversal

Forged +AT solubilization

size	Testing at room temperature							
mm	R	Rp 0.2	A%	Z%	Kv +20 °C	Kv +20 °C	Kv -196 °C	
from to	N/mm ² min	N/mm ² min	min (L)	min (L)	J min (L)	J min (T)	J min (T)	
-	-	-	-	-	-	-	-	-

Work-hardened EN 10088-3: 2014 in condition 2H (ex. +AT+C)

size	Testing at room temperature				
mm	R	Rp 0.2	A%		
from to	N/mm ²	N/mm ² min	min		
20	800-1000	500	12		+AT+C800 cold-drawn material

Transition curve determined by Kv impacts. Material solubilized at 1050 °C

Average	J	210	220	230	240	245	250	255
Test at °C		-200	-150	-100	-50	0	+50	+100

Approximate mechanical properties at low temperatures. Material solubilized at 1050 °C

R	N/mm ²	660	1100	1570	1900
Rp 0.2	N/mm ²	145	350	550	860
A	%	50	40	30	20
Test at °C		+24	-74	-196	-253

After cold forming, a stress relieving treatment at 280-420 °C, can increase the value of tensile strength of about 250 N/mm². This heat treatment also increases the fatigue limit

Effect of **cold-working** (hot-rolled +AT+C). Approximate values

R	N/mm ²	620	820	1000	1200	1320	1440	1620	1780
Rp 0.2	N/mm ²	300	580	730	880	1020	1180	1300	1460
A	%	46	22	14	10	9	9	9	9
Reduction	%	0	10	20	30	40	50	60	70

Minimum yield stress values at high temperatures on hot-rolled material +AT EN 10088-3: 2014

Rp 0.2	N/mm ²	210	200	190	185	180			
Test at	°C	100	150	200	250	300			

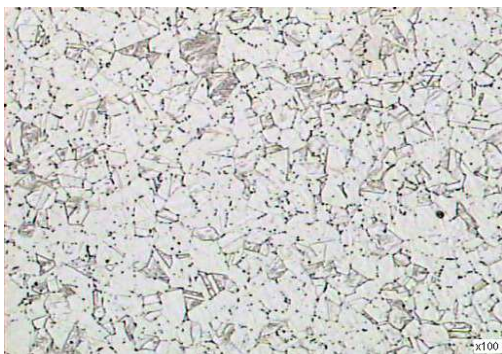
Thermal expansion	10 ⁻⁶ • K ⁻¹			▶	16.0	17.0	17.0	18.0	18.0	
Mod. of elasticity ^{b)}	long. GPa		186	200	194	186	179	172	165	
Poisson number	ν			0.28						
Electrical resistivity	$\Omega \cdot \text{mm}^2/\text{m}$			0.72	0.78	0.86		1.00	1.11	
Electrical conductivity	Siemens•m/mm ²			1.39	1.28	1.16		1.00	0.90	
Specific heat	J/(Kg•K)			500						
Density	Kg/dm ³			7.90						
Thermal conductivity	W/(m•K)			15.0	16.3				21.5	
Relative magnetic permeability	$\mu_r \text{ max}$			1.02 ^{a)}						
°C			-196	20	100	200	300	400	500	600

The symbol ▶ indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ^{a)} solubilized material^{b)} cold deformations result in a lower modulus; it may be increased by stress-relief heat treatment

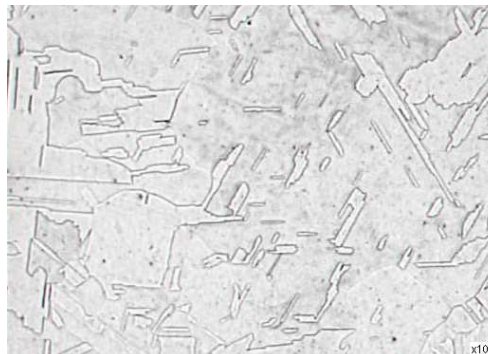
Corrosion resistance	Atmospheric		Chemical			x foods, organic acids, urban atmosphere, petroleum
Fresh water	<i>industrial</i>	<i>marine</i>	<i>mild</i>	<i>oxidizing</i>	<i>reducing</i>	
x	x	x	x	x		
Magnetic	no					
Machinability	difficult					
Hardening	cold-drawn and other cold plastic deformations					
Service temperature in air	max 400 °C for cold plastic deformations and 780 °C for hot-formed products					

Europe	USA	USA	China	Russia	Japan	India	Republic of
EN	UNS	ASTM	GB	GOST	JIS	IS	Korea KS
X10CrNi18-8	S30100	301	1Cr17Ni7	07Ch16N6	SUS 302	X07Cr18Ni9	STS 302

Micrographs of 1.4310 steel



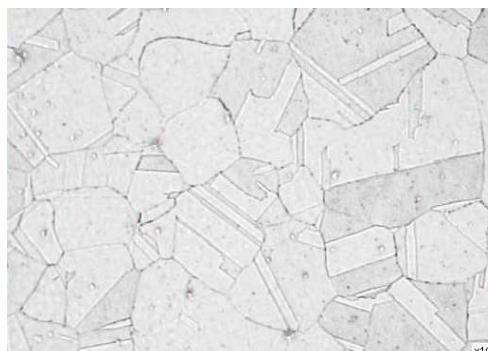
Untreated



+AT not completely recrystallized



Grain size 4



Grain size 9 - 10