Quality	**X10CrNi18-8**	**Austenitic Stainless Steel**	*Technical card 2018*
Number	**1.4310**		*Lucefin Group*

Chemical composition

C%	**Si%** max	**Mn%** max	**P%** max	**S%** max	**Cr%**	**Mo%** max	**Ni%**	**N%** 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**
1435-1400	1250-1150	1120-1000 water	not necessary	not suitable

Sensitization	**Quenching +Q**	**Tempering +T**	**Stress-relieving +SR**
avoid slow heating in the range of 420 and 800	not suitable	not suitable	400-250

MMA **welding -** AWSelectrodes

pre-heating	*post welding*
not necessary	slow cooling

joint with steel

carbon	CrMo alloyed	stainless
E309-E308	E309-E308	E308

cosmetic welding
E308

Chemical treatment ▪ *Passivation* 20 - 50% HNO_3 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**%	**Kv₂** +20 °C	**Kv₂** +20 °C	**HBW** a)	
from	to	N/mm²	N/mm² 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/mm² min	N/mm² min	min (L)	min (L)	J min (L)	J min (T)	J min (T)
		-	-	-	-	-	-	-

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

size		Testing at room temperature			
mm		**R**	**Rp** 0.2	**A**%	
from	to	N/mm²	N/mm² 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/mm²	660	1100	1570	1900
Rp 0.2	N/mm²	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

X10CrNi18-8 **n° 1.4310** austenitic stainless steel *Lucefin Group*

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

R	N/mm²	620	820	1000	1200	1320	1440	1620	1780
Rp 0.2	N/mm²	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/mm²	210	200	190	185	180
Test at	**°C**	**100**	**150**	**200**	**250**	**300**

Thermal expansion	$10^{-6} \cdot K^{-1}$			►	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	*v*			0.28						
Electrical resistivity	Ω • mm²/m			0.72	0.78	0.86		1.00		1.11
Electrical conductivity	Siemens•m/mm²			1.39	1.28	1.16		1.00		0.90
Specific heat	J/(Kg•K)			500						
Density	Kg/dm³			7.90						
Thermal conductivity	W/(m•K)			15.0	16.3				21.5	
Relative magnetic permeability	μr max			1.02 a)						
°C		**-196**		**20**	**100**	**200**	**300**	**400**	**500**	**600**

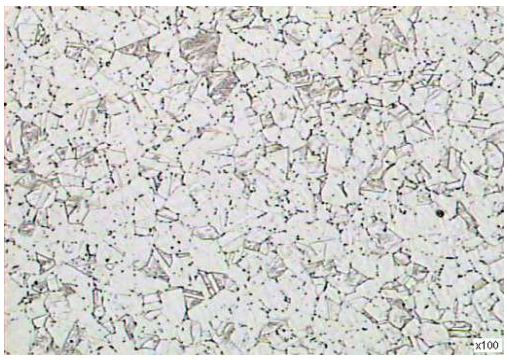
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ….. a) solubilized material
b) cold deformations result in a lower modulus; it may be increased by stress-relief heat treatment

Corrosion resistance	Atmospheric		Chemical			**x** foods, organic acids, urban atmosphere, petroleum
Fresh water	*industrial*	*marine*	*mild*	*oxidizing*	*reducing*	
x	**x**	**x**	**x**	**x**		

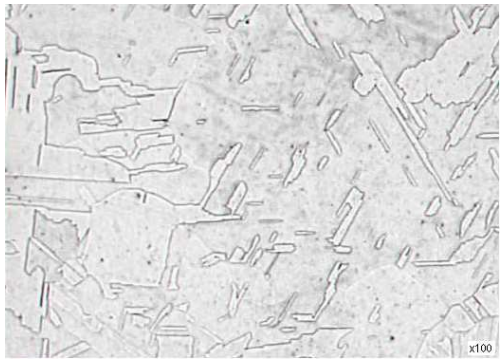
Magnetic	no
Machinability	difficult
Hardening	cold-drawn and other cold plastic deformations
Service temperature in air	max 400 °C for cold plastic deformations and 780 °C for hot-formed products

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

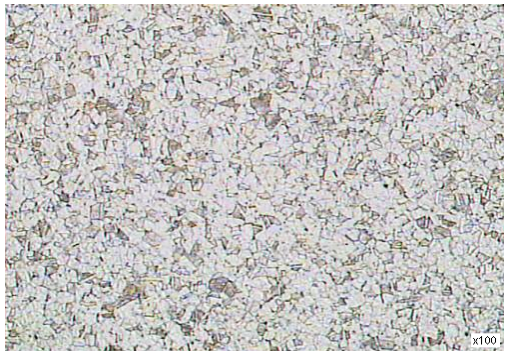
Micrographs of 1.4310 steel



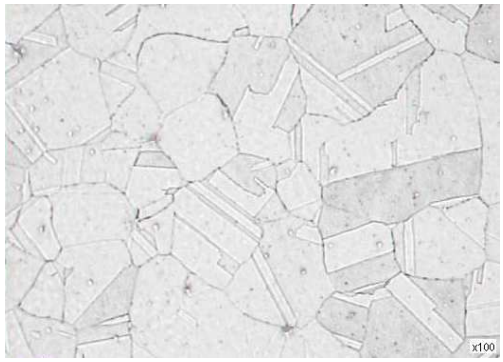
Untreated



+AT not completely recrystallized



Grain size 4



Grain size 9 - 10