Quality	**X14CrMoS17**	**Martensitic Stainless Steel**
Number	**1.4104**	

GRUPPO LUCEFIN Lovin' Steel

Chemical composition

C%	**Si%** max	**Mn%** max	**P%** max	**S%**	**Cr%**	**Mo%**	
0,10-0,17	1,00	1,50	0,040	0,15-0,35	15,5-17,5	0,20-0,60	EN 10088-1: 2014
± 0.01	+ 0.05	± 0.04	+ 0.005	± 0.02	± 0.2	± 0.03	
Product deviations are allowed							

Temperature °C

Melting range	**Hot-forming**	**Recrystallization +RA**	**Soft annealing +A**
1510-1430	1100-930	790-710 cooling to 300, then air	850-750 air
Isothermal annealing +I	**Quenching +Q**	**Tempering +T**	
not suitable	1060-980 air/oil/ /polymer	650-550 fast cooling in air	

MMA **welding –** AWS electrodes
pre-heating *annealing after w.*
difficult; address qualified electrodes producers
joint with steel

carbon	CrMo alloyed	stainless
E309	E309	E309 – E308

cosmetic welding
E309

Chemical treatment ▪ *Pickling* (20 - 50% HNO_3) + (2 - 6% $Na_2Cr_2O_7.2H_2O$) hot or cold

Mechanical properties

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

size mm		Testing at room temperature **R**	**Rp** 0.2	**A**%	**Kv** +20 °C	**HB** a)	a) for information only
from	to	N/mm²	N/mm² min	min	J min	max	
		730 max				220	+A annealed material
	60	650-850	500	12			+QT650 quenched and tempered
60	160	650-850	500	10			+QT650 quenched and tempered

Bright bars of heat-treated material EN 10088-3: 2014 in conditions 2H, 2B, 2G, 2P

size mm		Testing at room temperature **R**	**HB** a)	**R**	**Rp** 0.2	**A**%	**Kv** +20 °C
from	to	N/mm² max	max	N/mm²	N/mm² min	min	J min
	10 b)	880	280	700-980	580	7	
10	16	880	280	700-980	530	7	
16	40	800	250	650-930	500	9	
40	63	760	230	650-880	500	10	
63	100	730	220	650-850	500	10	
		+A annealed material		+QT650 quenched and tempered			

a) for information only
b) in the range of 1 mm ≤ d < 5 mm, values are valid only for rounds – the mechanical properties of non round bars of < 5 mm of thickness have to be agreed at the time of request and order

Forged (ASTM A 473-99 steel ASTM 430F)

size mm		Testing at room temperature **R**	**Rp** 0.2	**A**%	**Z%**	**Kv** +20 °C	**HB** a)	
from	to	N/mm²	N/mm² min	min	min	J min	max	
		485	275	20	45		223	+A annealed material

a) for information only

Cold-work hardened EN 10088-3: 2014 in conditions 2H (ex. +A+C)

size mm		Testing at room temperature **R**	**Rp** 0.2	**A**%	
from	to	N/mm²	N/mm² min	min	
	25	550-750	440	15	+C550 cold-drawn material

Table of tempering values at room temperature on rounds of Ø 20 mm after quenching at 1000°C in oil

R	N/mm²	880	860	860	900	920	910	880	820	660	600	580
Rp 0.2	N/mm²	710	690	680	690	700	700	670	610	470	420	380
A	%	12	13	13	13	13	13,5	14	14	15	16	17
Tempering **°C**		**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**	**650**	**700**

X14CrMoS17 **n° 1.4104** martensitic stainless steel *Lucefin Group*

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

R	N/mm^2	550	570	600	620	650	710	755	765	775
Rp 0.2	N/mm^2	320	440	480	490	540	620	635	640	650
A	%	22	18	16	14	13	12	10	10	9
Reduction	**%**	**0**	**5**	**8**	**10**	**15**	**20**	**25**	**26**	**29**

Thermal expansion	$10^{-6} \bullet K^{-1}$	►	10.0	10.5	10.5	10.5	
Modulus of elasticity	longitudinal GPa	215	212	205	200	190	
Poisson number	*v*	0,27-0,30					
Electrical resistivity	$\Omega \bullet mm^2/m$	0.70					
Electrical conductivity	Siemens•m/mm^2	1.43					
Specific heat	J/(Kg•K)	460					
Density	Kg/dm^3	7.70					
Thermal conductivity	W/(m•K)	25					
Relative magnetic permeability	μr	600-1100					
°C		**20**	**100**	**200**	**300**	**400**	

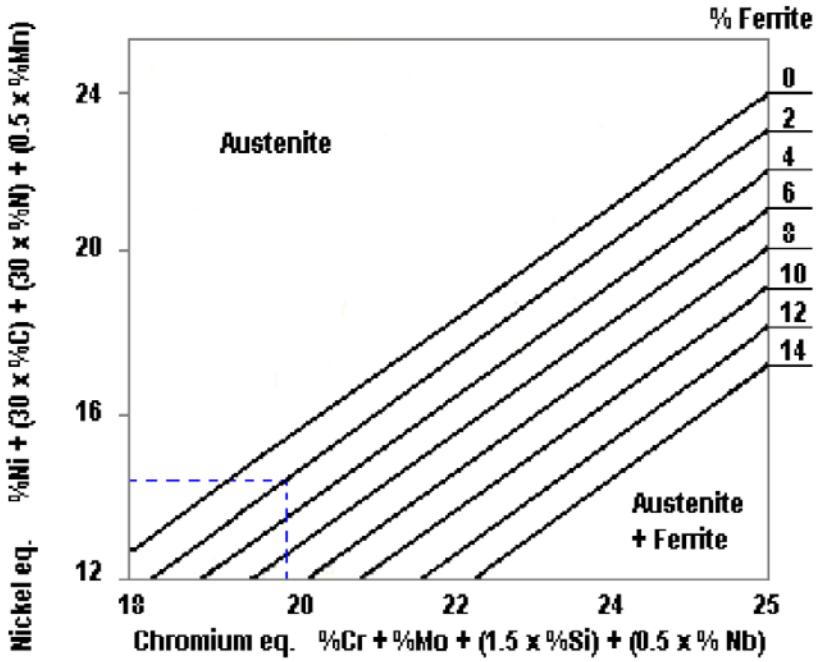
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C …..

Corrosion resistance	Atmospheric		Chemical			**x** petroleum, phenol, household cleaners, food
Fresh water	*industrial*	*marine*	*medium*	*oxidizing*	*reducing*	
x	**x**		**x**			

Magnetic	yes
Machinability	high
Hardening	by quenching, cold-drawn and and other cold plastic deformations
Service temperature in air	continuous service up to 740 °C; intermittent service up to 820 °C

Europe EN	**USA** UNS	**USA** ASTM	**China** GB	**Russia** GOST	**Japan** JIS	**India** IS	**Republic of Korea** KS
X14CrMoS17			Y10Cr17		SUS 430F		STS 430F

Calculation of ferrite percentage - De Long diagram



A careful study of chemical analysis is the best way to prevent **δ** (delta) ferrite presence in the finished product.
As from the graphic, some elements brought to the maximum or to the minimum of the analysis forks fixed for the chosen steel can modify equivalent Ni and equivalent Cr values. An accurate choice of targets during cast planning phase can prevent material brittleness caused by delta ferrite shaping.