Quality	**X105CrMo17**	**Martensitic Stainless Steel**	*Technical card 2018*
Number	**1.4125**		*Lucefin Group*

Chemical composition

C%	Si% max	Mn% max	P% max	S% [a] max	Cr%	Mo%	
0,95-1,20	1,00	1,00	0,040	0,030	16,0-18,0	0,40-0,80	EN 10088-3: 2014
± 0.03	+ 0.05	+ 0.03	+ 0.005	± 0.005	± 0.2	± 0.05	

Product deviations are allowed

[a] for improving machinability, it is allowed a controlled sulphur content of 0,015 % - 0,030 %; for polishability, it is suggested a controlled sulphur content of max 0,015 %

Temperature °C

Melting range	**Hot-forming**	**Full annealing**	**Soft annealing +A**
1440-1410	1100-930	900-845 furnace cooling to 590 after air	840-780 air (HB max 285)
Isothermal annealing +I	**Quenching +Q**	**Tempering +T**	**Stress-relieving +SR**
900-840 cooling 30 °C/h to 690, then air (HB 243-253)	1050-1000 air / oil / polymer (HRC 60)	425-180 air	300-100 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 special

Subcritical annealing 770-730 °C air cooling

Transformation temperature during heating **Ac1** ~ 780, **Ac3** ~ 835 and during cooling **Ms** ~ 180, **Mf** ~ 30

Chemical treatment ▪ *Pickling* (15 - 25% HNO_3) + (1 - 8% HF) hot.

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**%	**Kv2** +20 °C	**HBW** [a]	[a] for information only
from	to	N/mm²	N/mm² min	min	J min	max	
	100	-	-	-	-	285	+A annealed material

Bars, typical values according to UNS S44004 steel 440C

size		Testing at room temperature									
mm		**R**	**Rp** 0.2	**A**%	**Z%**	**HB**	**R**	**Rp** 0.2	**A**%	**Z%**	**HB**
from	to	N/mm² min	N/mm² min	min	min	max	N/mm² min	N/mm² min	min	min	max
		758	448	14	25	269	862	689	7	20	285
		+A **hot-rolled** annealed					+A+C **cold-drawn**				

Forged (ASTM A 473-99 steel ASTM 440C)

size		Testing at room temperature						
mm		**R**	**Rp** 0.2	**A**%	**Z%**	**Kv** +20 °C	**HB** [a]	
from	to	N/mm²	N/mm² min	min	min	J min	max	
		-	-	-	-	-	269	+A annealed material

[a] for information only

Table of tempering values at room temperature on rounds of Ø 16 mm after quenching at 1020 °C in oil

HB	654	634	595	595	595	615	615	432	381
HRC	60	59	57	57	57	58	58	46	41
Tempering **°C**	**100**	**200**	**300**	**350**	**400**	**450**	**500**	**550**	**600**

X105CrMo17 **n° 1.4125** martensitic stainless steel *Lucefin Group*

Thermal expansion	$10^{-6} \cdot K^{-1}$	►	10.4	10.8	11.2	11.6	12.0
Modulus of elasticity	longitudinal GPa	215	212	205	200	190	
Poisson number	*v*	0,283					
Electrical resistivity	$\Omega \cdot mm^2/m$	0.80					
Electrical conductivity	$Siemens \cdot m/mm^2$	1.25					
Specific heat	$J/(Kg \cdot K)$	430					
Density	Kg/dm^3	7.70					
Thermal conductivity	W/(m•K)	15					
Relative magnetic permeability	μr	700-1000 ~					
°C		**20**	**100**	**200**	**300**	**400**	**500**

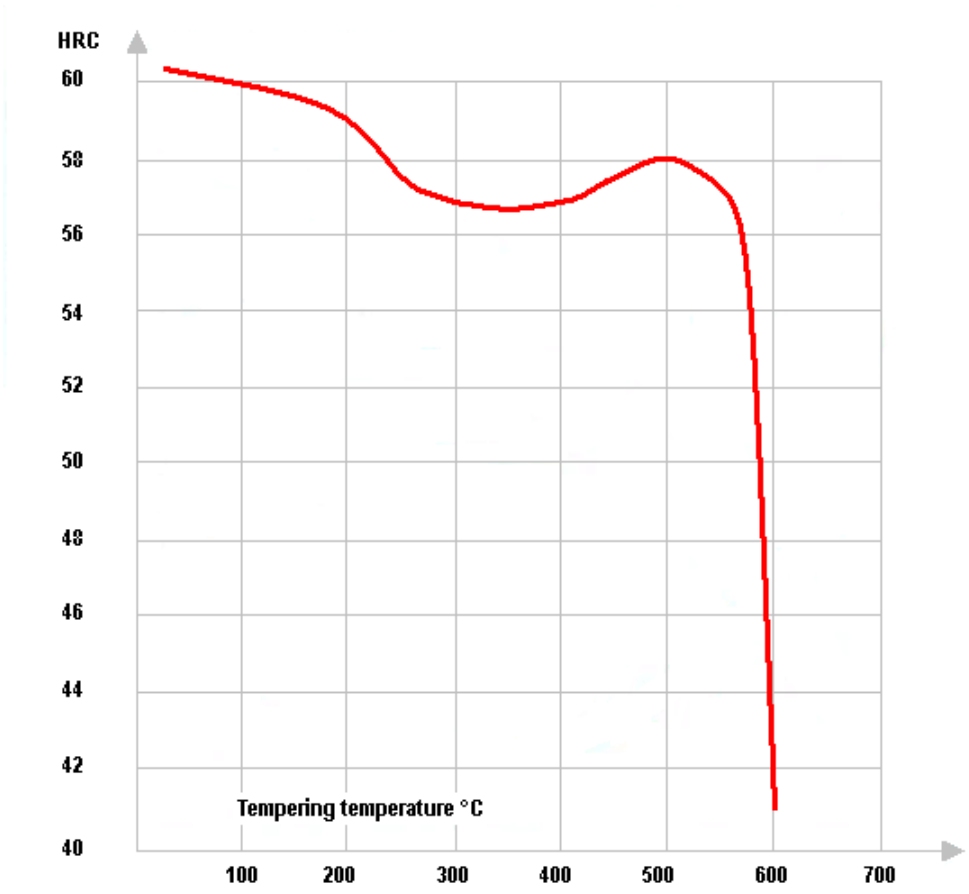
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C .....

Corrosion resistance	Atmospheric		Chemical			**x** steam, petroleum, ammonia, gasoline, alcohol, foods
Fresh water	*industrial*	*marine*	*medium*	*oxidizing*	*reducing*	
x						

Magnetic	yes
Machinability	difficult
Hardening	by quenching
Service temperature in air	Resistance to oxidation up to 700 °C

Europe EN	**USA** UNS	**USA** ASTM	**China** GB	**Russia** GOST	**Japan** JIS	**India** IS	**Republic of Korea** KS
X105CrMo17	S44004	**440C**	108Cr17	95Ch18	SUS 440C	(X108Cr17Mo)	STS 440C

Tempering diagram



Hardness values at various tempering temperatures after quenching at 1020 °C in oil