

Quality	X105CrMo17	Martensitic
Number	1.4125	Stainless Steel

Chemical composition

C%	Si% max	Mn% max	P% max	S% ^{a)} max	Cr%	Mo%	
0,95-1,20	1,00	1,00	0,040	0,015	16,0-18,0	0,40-0,80	EN 10088-1: 2005
± 0.03	+ 0.05	+ 0.03	+ 0.005	+ 0.003	± 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	MMA welding – AWS electrodes <i>pre-heating annealing after w.</i>
1440-1410	1100-900	900-845 furnace cooling to 590 after air	840-780 air (HB max 285)	Difficult; address qualified electrodes producers <i>joint with steel</i>
Isothermal annealing +I	Quenching +Q	Tempering +T	Stress-relieving +SR	carbon CrMo alloyed stainless E309 E309 E309 – E308 <i>cosmetic welding</i> E309 special
900-840 controlled cooling to 690, then air (HB 243-253)	1050-1000 air / oil / polymer (HRC 60)		300-100 air	

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

Mechanical properties

Hot-formed EN 10088-3: 2005 in conditions 1C, 1E, 1D, 1X, 1G, 2D

size mm	Testing at room temperature					
from to	R	Rp 0.2	A%	Kv +20 °C	HB ^{a)}	^{a)} for information only
	N/mm ²	N/mm ² min	min	J min	max	
100					285	+A annealed material

Bars, typical values according to UNS S44004 steel 440C

size mm	Testing at room temperature									
from to	R	Rp 0.2	A%	C%	HB	R	Rp 0.2	A%	C%	HB
	N/mm ² min	N/mm ² min	min	min	max	N/mm ² min	N/mm ² 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 mm	Testing at room temperature					
from to	R	Rp 0.2	A%	C%	Kv +20 °C	HB ^{a)}
	N/mm ²	N/mm ² 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	650	700

X105CrMo17 n° 1.4125 martensitic stainless steel

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	ν		0,283				
Electrical resistivity	$\Omega \cdot mm^2/m$		0.80				
Electrical conductivity	Siemens·m/mm ²		1.25				
Specific heat	J/(Kg·K)		430				
Density	Kg/dm ³		7.70				
Thermal conductivity	W/(m·K)		15				
Relative magnetic permeability	μ_r		700-1000 ~				
°C			20	100	200	300	400 500 800

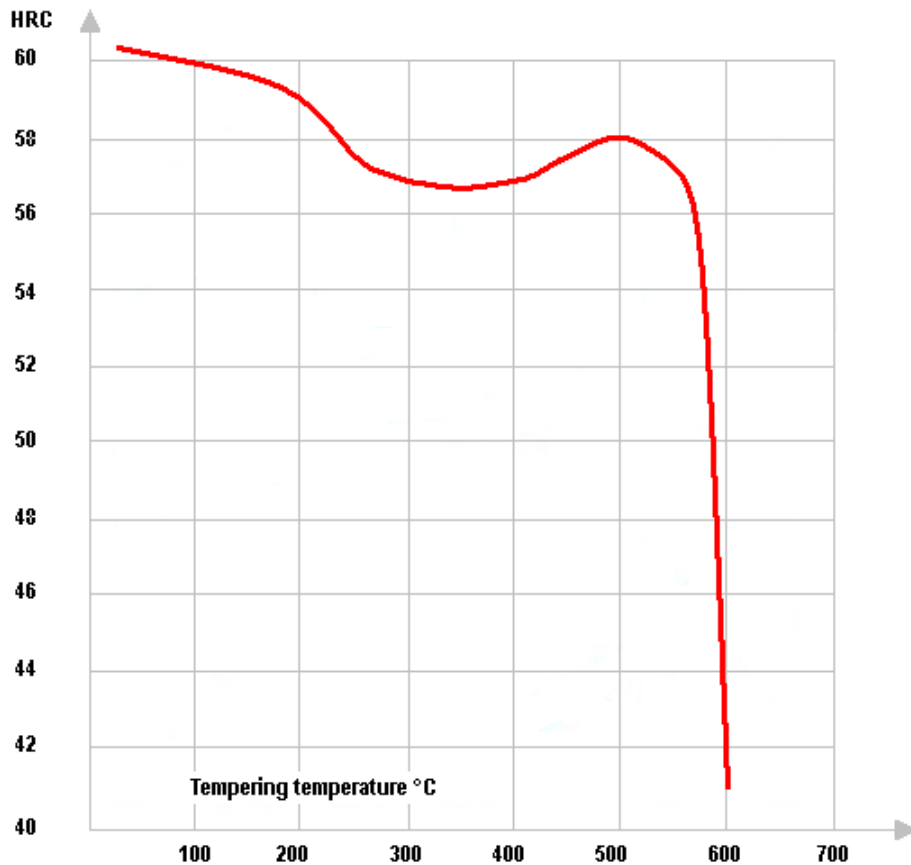
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C

Corrosion resistance	Atmospheric		Chemical			x steam, petroleum, ammonia, gasoline, alcohol, foods
Fresh water	<i>industrial</i>	<i>marine</i>	<i>medium</i>	<i>oxidizing</i>	<i>reducing</i>	
x						

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

Europe	USA	USA	China	Russia	Japan	India	Republic of Korea
EN	UNS	ASTM	GB	GOST	JIS	IS	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.