

<b>Quality</b>	<b>X105CrMo17</b>	<b>Martensitic</b>	<i>Technical card 2018</i>
Number	<b>1.4125</b>	<b>Stainless Steel</b>	<i>Lucefin Group</i>

### Chemical composition

C%	Si%	Mn%	P%	S% a)	Cr%	Mo%	
	max	max	max	max			
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	MMA welding – AWS electrodes
1440-1410	1100-930	900-845 furnace cooling to 590 after air	840-780 air (HB max 285)	<i>pre-heating annealing after w.</i>
				Difficult; address qualified electrodes producers
Isothermal annealing +I	Quenching +Q	Tempering +T	Stress-relieving +SR	joint with steel
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	carbon CrMo alloyed stainless E309 E309 E309 – E308
				<i>cosmetic welding</i> 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<sub>3</sub>) + (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%	Kv <sub>2</sub> +20 °C	HBW a)	a) for information only	
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> 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		
from	to	N/mm <sup>2</sup> min	N/mm <sup>2</sup> min	min	min	max		
		758	448	14	25	269		
							+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/mm <sup>2</sup>	N/mm <sup>2</sup> 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

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

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

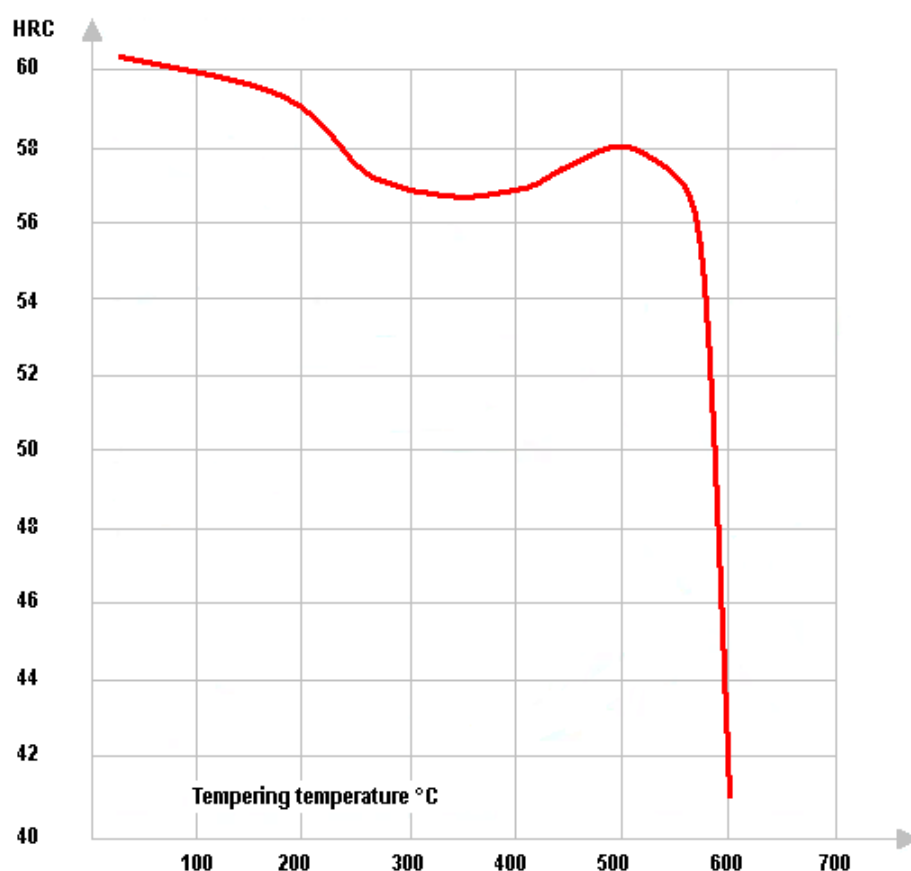
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C .....

<b>Corrosion resistance</b>	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						

<b>Magnetic</b>	yes
<b>Machinability</b>	difficult
<b>Hardening</b>	by quenching
<b>Service temperature in air</b>	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	<b>440C</b>	108Cr17	95Ch18	SUS 440C	(X108Cr17Mo)	STS 440C

Tempering diagram



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