

<b>Quality</b>	<b>X3CrNb17</b>	<b>Ferritic</b>	<i>Technical card 2018</i>
Number	<b>1.4511</b>	<b>Stainless Steel</b>	<i>Lucefina Group</i>

### Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Nb% <sup>a)</sup>	N%	Mo%	
max	max	max	max	max		max			
0,05	1,00	1,00	0,040	0,030 <sup>b)</sup>	16,0-18,0	1,00	-	-	EN 10088-3: 2014
± 0.01	+ 0.05	+ 0.03	+ 0.005	± 0.005	± 0.2	+ 0.05	-	-	

Product deviations are allowed. <sup>a)</sup> Nb: 12 x C; <sup>b)</sup> For polishability, it is suggested a controlled sulphur content of max 0,015 %

### Temperature °C

Melting range	Hot-forming	Solution annealing +AT	Stabilizing	Curie temperature	MMA welding – AWS electrodes
1500-1470	1100-850	not suitable	not necessary		<i>pre-heating</i> not necessary
					<i>post weldin</i> not necessary
Sensitization	Quenching +Q	Tempering +T	Soft annealing +A		<i>joint with steel</i>
not suitable	not suitable	not suitable	850-750 air		carbon CrMo stainless
					E308 E309-E308 E308L
					<i>cosmetic welding</i> 1.4316

**Chemical treatment** - Pickling (15-25% HNO<sub>3</sub>) + (1-8% HF) hot

### Mechanical properties

**Material annealed +A** EN 10088-3: 2014 in conditions 1C, 1E, 1D, 1X, 1G, 2D

size		Testing at room temperature						
mm		R	Rp 0.2	Rp 0.2	A% t < 3	A% t < 3	HBW	
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min (L)	N/mm <sup>2</sup> min (T)	min (L)	min (T)	for inf. only	
	50	420-620	200	-	20	-	200 max	

(L) = longitudinal (T) = transversal

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

size mm		R	Rp 0.2	A%
from	to	N/mm <sup>2</sup> min	N/mm <sup>2</sup> min	min
	10	500-750	320	8
10	16	480-750	300	10
16	40	400-700	240	15
40	50	400-700	240	15

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

R	N/mm <sup>2</sup>	450	560	600	620	660	700	750	790
Reduction	%	<b>0</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>

**Minimum values for the 0,2 % proof strength at elevated temperatures, annealed material +A** EN 10088-2: 2014

Rp 0.2	N/mm <sup>2</sup>	-	190	180	170	160	155	-	-
Test at	°C	<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>

<b>Thermal expansion</b>	10 <sup>-6</sup> • K <sup>-1</sup>	►	10	10	10.5	10.5	11		
<b>Modulus of elasticity</b>	longitudinal GPa		220	215	210	205	195		
<b>Poisson number</b>	v		0.28	~					
<b>Electrical resistivity</b>	Ω • mm <sup>2</sup> /m		0.60	0.75	0.95	1.10	1.20		
<b>Electrical conductiv.</b>	Siemens•m/mm <sup>2</sup>		2.9						
<b>Specific heat</b>	J/(Kg•K)		460						
<b>Density</b>	Kg/dm <sup>3</sup>		7.70						
<b>Thermal conductivity</b>	W/(m•K)		25	28	30	31.5	33	34	
<b>°C</b>			<b>20</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>600</b>

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

Corrosion resistance	Atmospheric		Chemical			x steam, food and dairy products, organic acids, saline solutions
	Fresh water		industrial	marine	medium oxidizing reducing	
x	x		x			

<b>Magnetic</b>	yes
<b>Machinability</b>	good
<b>Hardening</b>	moderate by cold-drawn and other cold plastic deformations
<b>Service temperature in air</b>	oxidation resistance up to 900

Europe	USA	USA	China	Russia	Japan	India	Republic of Korea
EN	UNS	ASTM	GB	GOST	JIS	IS	KS
X3CrNb17	430Nb				SUS 430LX		STS 430LX