

Quality	X2CrNiMo18-14-3	Austenitic	<i>Technical card 2018</i>
Number	1.4435	Stainless Steel	<i>Lucefin Group</i>

Chemical composition

C%	Si%	Mn%	P%	S% ^{a)}	Cr%	Ni%	N%	Mo%	
max	max	max	max	max			max		
0,03	1,00	2,00	0,045	0,030	17,0-19,0	12,5-15,0	0,10	2,5-3,0	EN 10088-3: 2014
+ 0.005	+ 0.05	± 0.04	+ 0.005	± 0.005	± 0.2	± 0.15	+ 0.01	± 0.1	

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	Solution annealing (Solubilization) +AT	Stabilizing	Soft annealing +A	MMA welding – AWS electrodes
1450-1400	1150-980	1180-1120 water	not required	not suitable	<i>pre-heating</i> not necessary <i>post welding</i> slow cooling
Sensitization	Quenching +Q	Tempering +T	<i>joint with steel</i>		
not required	not suitable	not suitable	carbon	CrMo alloyed	stainless
			E309-E308	E309-E308	E308
			<i>cosmetic welding</i> E 316L		

Chemical treatment ▪ *Pickling* (6 - 25% HNO₃) + (0.5 - 8% HF) hot ▪ *Passivation* 20 - 50% HNO₃ 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%	A%	Kv ₂ +20 °C	Kv ₂ +20 °C	HBW ^{a)}	
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	max	
	160	500-700	200	40	-	100	-	215	+AT solubilization
160	250	500-700	200	-	30	-	60	215	+AT solubilization
	660	320	55			210		200	<i>Typical values</i>

^{a)} for information only

(L) = longitudinal (T) = transversal

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

size		Testing at room temperature						
mm		R	Rp 0.2	A%	A%	Kv ₂ +20 °C	Kv ₂ +20 °C	
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	
	10 ^{b)}	600-950	400	25	-	-	-	
10	16	600-950	400	25	-	-	-	+AT solubilization
16	40	500-850	235	30	-	100	-	
40	63	500-850	235	30	-	100	-	
63	160	500-700	235	40	-	100	-	
160	250	500-700	235	-	30	-	60	

^{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

(L) = longitudinal (T) = transversal

Forged UNI EN 10250-4: 2001

size		Testing at room temperature						
mm		R	Rp 0.2	A%	A%	Kv +20 °C	Kv +20 °C	
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	
	250	500-700	200	-	30	100	60	+AT solubilization

Transition curve determined by Kv impacts. Material solubilized at 1050 °C

Average	J	190	210	215	220	230	240	250
Test at	°C	-160	-120	-80	-40	0	+40	+80

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

R	N/mm ²	640	780	900	1050	1180	1280	1350	1400
Rp 0.2	N/mm ²	320	640	800	910	1000	1080	1120	1190
A	%	50	30	18	12	8	8	8	7
Reduction	%	0	10	20	30	40	50	60	70

Minimum values at high temperatures on material +AT EN 10083-3:2014 / EN 10222-5:1999

R_p 0.2	N/mm ²	165	150	137	127	119	113	108	103	100	98
R	N/mm ²	420	400	380	375	370	370	-	-	-	-
Test at	°C	100	150	200	250	300	350	400	450	500	550
Thermal expansion	10 ⁻⁶ • K ⁻¹	▶	16.0	16.5	17.0	17.5	18.0				
Modulus of elasticity	GPa	200	194	186	179	172	165				
Poisson number	ν	0.28									
Electrical resistivity	$\Omega \cdot \text{mm}^2/\text{m}$	0.75									
Electrical conductivity	Siemens•m/mm ²	1.33									
Specific heat	J/(Kg•K)	500									
Density	Kg/dm ³	8.00									
Thermal conductivity	W/(m•K)	15.0									
Relative magnetic permeability	μ_r	1.1 ~									
°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 intergranular, food, acids (organic, sulfuric and phosphoric acids), oil
Fresh water	<i>industrial</i>	<i>marine</i>	<i>medium</i>	<i>oxidizing</i>	<i>reducing</i>	
x	x	x	x	x		
Magnetic	no					
Machinability	mean					
Hardening	cold-drawn and other cold plastic deformations					
Service temperature in air	continuous service up to 850 °C; intermittent service up to 800 °C					

Europe	USA	USA	China	Russia	Japan	India	R. Corea
EN	UNS	ASTM	GB	GOST	JIS	IS	KS
X2CrNiMo18-14-2	(S31603)	(316L)	00Cr18Ni15Mo3	03Ch17N14M3	(SUS 316L)	(X02Cr17Ni12Mo2)	(STS 316L)

Marine sector

