



Quality	X1NiCrMoCuN25-20-7	Austenitic	<i>Technical card rev. 2018</i>
Number	1.4529	Stainless Steel (Superaustenitic)	Lucefin Group

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Ni%	N%	Mo%	Cu%	
max	max	max	max	max						EN 10088-3: 2014
0,02	0,50	1,00	0,030	0,010	19,0-21,0	24,0-26,0	0,15-0,25	6,0-7,0	0,50-1,50	
+ 0.005	+ 0.05	+ 0.03	+ 0.005	+ 0.003	± 0.20	± 0.20	± 0.02	± 0.10	± 0.10	

Product deviations are allowed

Temperature °C

Melting range	Hot-forming	Solution annealing (Solubilization) +AT	MMA welding – AWS electrodes
1420-1360	1200-950	1180-1120 water, forced air	<i>inter-pass</i> 150 max <i>post welding</i>
Soft annealing +A	Stress relieving +SR		<i>joint with steel</i>
not suitable	450-230 air		carbon CrMo alloy. stainless
			E Ni 6625 E Ni 6625 E NiCrMo-13
			<i>cosmetic welding</i> E NiCrMo-13

Chemical treatment - Pickling (6 - 25% HNO₃) + (0.5 - 8% HF) hot ▪ Passivation 20 - 50% HNO₃ hot

Mechanical properties

Heat-treated material (+AT solubilization) EN 10088-3: 2014 in condition 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	Kv ₂ -196 °C ^{b)}	HBW ^{a)}
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	J min (T)	max
	160	650-850	300	40	-	100	-	40	250
160	250	650-850	300	-	35	-	60	40	

^{a)} for information only (L) = longitudinal (T) = transversal ^{b)} EN 10272 -2008

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	
from	to	N/mm ² min	N/mm ² min	min (L)	min (T)	J min (L)	
	10 ^{b)}	700-1150	550	15	-	-	
10	16	700-1150	550	15	-	-	
16	40	650-1050	300	30	-	100	+AT
40	63	650-900	300	30	-	100	solubilization
63	160	650-850	300	40	-	100	

^{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	650-850	300	-	35	100	60	

+AT solubilization

Hot-rolled plate +AT solubilization EN 10028-7: 2007

size		Testing at room temperature						
mm		R	Rp 0.2	A%	A%	Kv +20 °C	Kv +20 °C	Kv -196 °C
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	J min (T)	J min (T)
	75	650-850	300	-	40	100	60	60

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

R	N/mm ²	675	740	870	990	1080	1240	1290	1350	1450
Reduction %		0	10	20	30	40	50	60	70	80

After cold deformation with a reduction higher than 15%, it is recommended solution annealing

Minimum yield stress and tensile strength values at high temperatures on material +AT - EN 10088-3: 2014 / EN 10272: 2007

R_p 0.2	N/mm ²	230	210	190	180	170	165	160	
R	N/mm ²	610	585	560	540	525	515	510	
Test at	°C	100	150	200	250	300	350	400	
Thermal expansion	10 ⁻⁶ • K ⁻¹	▶		15.8	16.1	16.5	16.9	17.3	
Modulus of elasticity	longitudinal GPa		195	190	182	174	166	158	
Poisson number	ν		0.33						
Electrical resistivity	Ω • mm ² /m		1.00						
Electrical conduc.	Siemens•m/mm ²		1.00						
Specific heat	J/(Kg•K)		450						
Density	Kg/dm ³		8.1						
Thermal conductivity	W/(m•K)		12.0	12.9	14.4	16.5	18.5	20.1	21.6
Relative magnetic permeability	μ _r		1.01						
°C			20	100	200	300	400	500	600

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

Corrosion resistance	Atmospheric		Chemical			x chlorides, sulphuric, phosphoric, halides, intercrystalline
Brackish water	<i>industrial</i>	<i>marine</i>	<i>medium</i>	<i>oxidizing</i>	<i>reducing</i>	
x	x	x	x	x	x	

Magnetic	no
Machinability	mean (to use low cutting speed and reduced depth of cut)
Hardening	cold-drawn and other cold plastic deformations
Service temperature	-196 °C / +400 °C. Avoid heating for long time in thr range of 600 and 1000 °C

Europe	USA	USA	China	Russia	Japan	India	R. Corea
EN	UNS	ASTM	GB	GOST	JIS	IS	KS
X1NiCrMoCuN22-20-7	N08925						

Pitting Resistance Equivalen (Hebsleb 1982. Truman 1987)

Super-austenitic steels, ferritic and duplex have good resistance to pitting when PRE is between 40 and 60

Formulae : Cr% + (3,3 x Mo%) + (30 x N%)

Steel 1.4529 Cr% = 20 - Mo% = 6,5 - N% = 0,20 **PRE = 47**