

Quality	X3CrNiCu18-9-4	Austenitic	<i>Technical card 2018</i>
Number	1.4567	Stainless Steel	<i>Lucefin Group</i>

Chemical composition

C%	Si%	Mn%	P%	S% ^{a)}	Cr%	Ni%	N%	Cu% ^{b)}	
max	max	max	max	max			max		
0,04	1,00	2,00	0,045	0,030	17,0-19,0	8,5-10,5	0,10	3,0-4,0	EN 10088-3: 2014
± 0.01	+ 0.05	± 0.04	+ 0.005	± 0.005	± 0.2	± 0.1	+ 0.01	± 0.1	

Product deviations are allowed

^{a)} for improving machinability, it is suggested a controlled sulphur content of 0,015 % - 0,030 %

^{b)} for steel intended to cold-work hardening and extrusion, it is allowed a Cu content of max 1,0 %

^{a)} 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	1200-900	1100-1000 water	not necessary	not suitable	<i>pre-heating</i> not necessary
					<i>post welding</i> slow cooling
Sensitization	Quenching +Q	Tempering +T			joint with steel
sensitization test at 700-450	not suitable	not suitable			carbon
					CrMo alloyed
					stainless
					E 316L
					E 316L
					cosmetic welding
					E 316L

Chemical treatment • *Pickling* (6 - 25% HNO₃) + (0.5 - 8% HF) hot or cold. *Passivation* 20 - 45% HNO₃ cold

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	450-650	175	45	-	-	-	215

^{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)}	600-850	400	25	-	-	-	
10	16	600-850	340	25	-	-	-	+AT solubilization
16	40	450-800	175	30	-	100	-	
40	63	450-800	175	30	-	100	-	
63	160	450-650	175	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

size		Testing at room temperature						
mm		R	Rp 0.2	A%	A%	Kv +20 °C	HB ^{a)}	
from	to	N/mm ²	N/mm ² min	min (L)	min (T)	J min (L)	max	
		-	-	-	-	-	215	+AT solubilization

^{a)} for information only

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

R	N/mm ²	560	720	820	940	1010	1120	1180	1300	1380
Rp 0.2	N/mm ²	300	560	710	820	900	990	1070	1200	1270
A	%	60	30	18	12	10	8	8	8	8
Reduction %		0	10	20	30	40	50	60	70	75

Thermal expansion	$10^{-6} \cdot K^{-1}$	▶	16.7	17.2	17.7	18.1
Modulus of elasticity	longitudinal	GPa	200	194	186	172
Poisson number	ν		0.28			
Electrical resistivity	$\Omega \cdot mm^2/m$		0.73			
Electrical conductivity	Siemens	m/mm^2	1.33			
Specific heat	J/(Kg·K)		500			
Density	Kg/dm ³		7.90			
Thermal conductivity	W/(m·K)		15.0	16.6		
Relative magnetic permeability	$\mu_{r \max}$		1.02			

°C 20 100 200 300 400 600 800

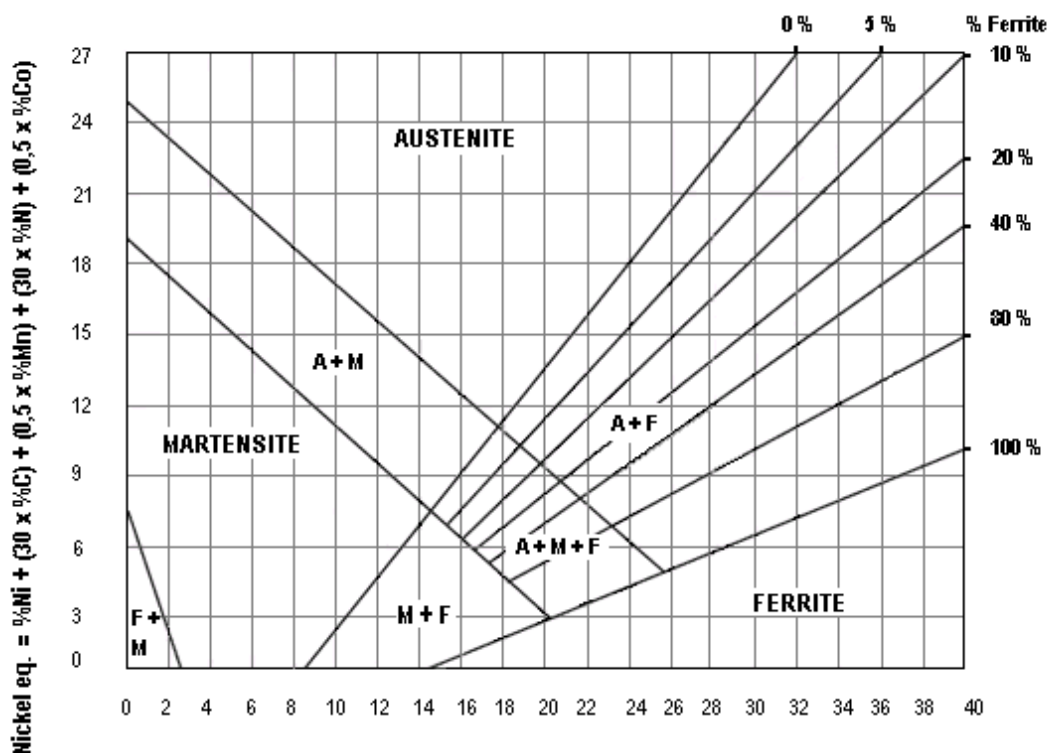
The symbol ▶ indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C

Corrosion resistance	Atmospheric			Chemical			x intercrystalline c. pitting, urban water, stress corrosion
	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	high
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	Republic of Korea
EN	UNS	ASTM	GB	GOST	JIS	IS	KS
X3CrNiCu18-9-4	S30430		06Cr18Ni9Cu3		SUS XM7		STS XM7

Schaeffler diagram (extended formulas)



The diagram is divided into three main areas which correspond to the structures of the weld bead: austenitic, ferritic and martensitic. Thanks to this calculation method, it is possible to determine before-hand the structures which are likely to be present in the weld bead and therefore to correctly choose the weld material according to the desired final structure.