TRAFITECH

Quality	X3CrNiCu18-9-4	**Austenitic Stainless Steel**	*Technical card 2018*
Number	**1.4567**		*Lucefin Group*

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**
1450-1400	1200-900	1100-1000 water	not necessary	not suitable
Sensitization	**Quenching +Q**	**Tempering +T**		
sensitization test at 700-450	not suitable	not suitable		

MMA **welding –** AWS electrodes

pre-heating	*post welding*
not necessary	slow cooling

joint with steel

carbon	CrMo alloyed	stainless
E 316L	E 316L	E 316L

cosmetic welding
E 316L

Chemical treatment ▪ *Pickling* (6 - 25% HNO_3) + (0.5 - 8% HF) hot or cold. *Passivation* 20 - 45% HNO_3 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%**	**Kv₂** +20 °C	**Kv₂** +20 °C	**HBW** a)	
from	to	N/mm²	N/mm² min	min (L)	min (T)	J min (L)	J min (T)	max	
	160	450-650	175	45	-	-	-	215	+AT solubilization

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/mm²	N/mm² 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/mm²	N/mm² 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/mm²	560	720	820	940	1010	1120	1180	1300	1380
Rp 0.2	N/mm²	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	179	172		127
Poisson number	*v*	0.28						
Electrical resistivity	$\Omega \cdot mm^2/m$	0.73						
Electrical conductivity	$Siemens \cdot m/mm^2$	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**

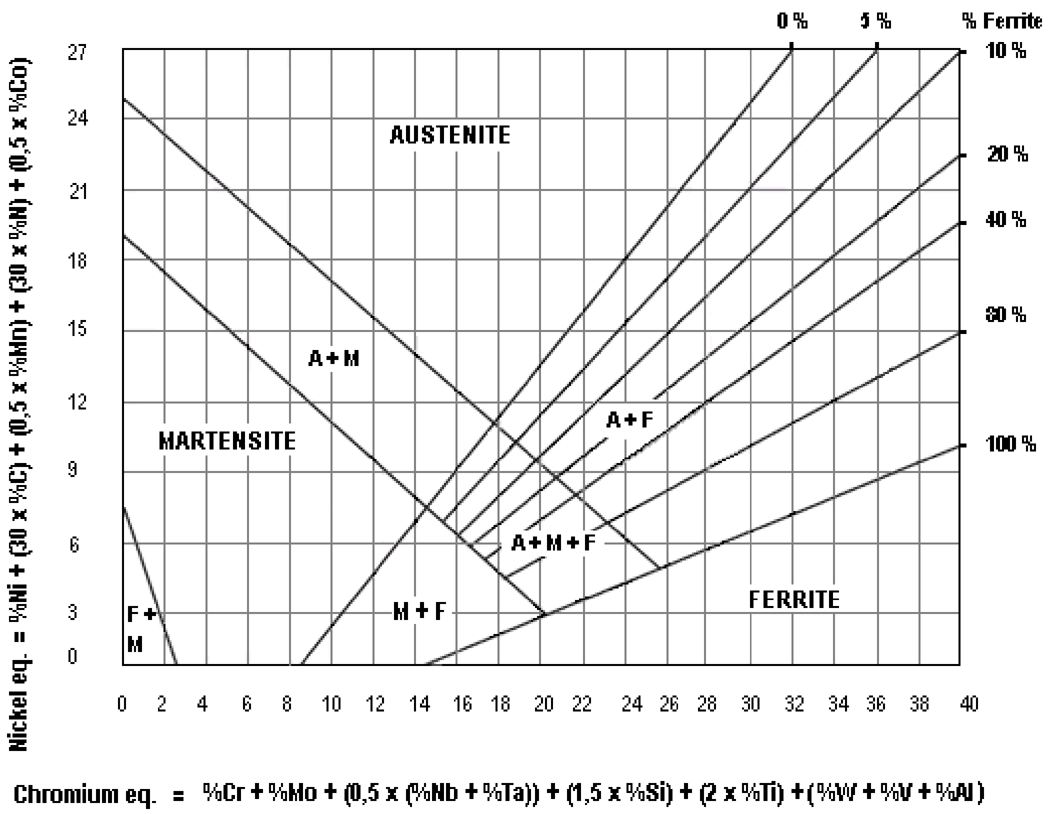
The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ……...

Corrosion resistance	Atmospheric		Chemical			**x** intercrystalline c.
Fresh water	*industrial*	*marine*	*medium*	*oxidizing*	*reducing*	pitting, urban water,
x	**x**	**x**	**x**	**x**		stress corrosion

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 EN	**USA** UNS	**USA** ASTM	**China** GB	**Russia** GOST	**Japan** JIS	**India** IS	**Republic of Korea** KS
X3CrNiCu18-9-4	S30430		06Cr18Ni9Cu3		SUS XM7		STS XM7

Schaeffler diagram (extendet 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.