Quality	**X8CrNiS18-9**	**Austenitic Stainless Steel**	*Technical card 2018*
Number	**1.4305**		*Lucefin Group*

Chemical composition

C% max	**Si%** max	**Mn%** max	**P%** max	**S%**	**Cr%**	**Ni%**	**N%** max	**Cu%** max	
0,10	1,00	2,00	0,045	0,15-0,35	17,0-19,0	8,0-10,0	0,10	1,00	EN 10088-3: 2014
± 0.01	+ 0.05	± 0.04	+ 0.005	± 0.02	± 0.2	± 0.1	+ 0.01	+ 0.04	

Product deviations are allowed

Temperature °C

Melting range	**Hot-forming**	**Solution annealing** (Solubilization) **+AT**	**Stabilizing**
1420-1400	1200-925	1150-1040 water / air	not necessary

Sensitization	**Quenching +Q**	**Tempering +T**	**Soft annealing +A**
sensitization test at 800-450	not suitable	not suitable	not suitable

MMA **welding –** AWS electrodes

pre-heating *post welding*

not recommended

joint with steel

carbon	CrMo alloyed	stainless
butter E309 - E312, finish with E308	the same as carbon steels	E308 - E312

cosmetic welding
E308 – E312

Chemical treatment ▪ Passivation (20 - 50% HNO_3) + (2 - 6% $Na_2Cr_2O_7 \cdot 2H_2O$) hot or 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	500-750	190	35	-	-	-	230	+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%**	**Kv₂** +20 °C	**Kv₂** +20 °C	
from	to	N/mm²	N/mm² min	min (L)	min (T)	J min (L)	J min (T)	
	10 b)	600-950	400	15	-	-	-	
10	16	600-950	400	15	-	-	-	+AT solubilization
16	40	500-850	190	20	-	-	-	
40	63	500-850	190	20	-	-	-	
63	160	500-750	190	35	-	-	-	

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 (ASTM A 473-17a steel ASTM 303)

size		Testing at room temperature						
mm		**R**	**Rp** 0.2	**A%**	**Z%**	**Kv** +20 °C	**Kv** +20 °C	
from	to	N/mm² min	N/mm² min	min (L)	min (L)	J min (L)	J min (T)	
		515	205	40	50	-	-	+AT solubilization

Work-hardned by cold-drawing EN 10088-3: 2014 in condition 2H (ex. +AT+C)

size		Testing at room temperature			
mm		**R**	**Rp** 0.2	**A%**	
from	to	N/mm²	N/mm² min	min	
	35	700-850	350	20	+AT+C700 cold-drawn material
	25	800-1000	500	12	+AT+C800 cold-drawn material

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

Average	J	212	222	230	238	244	250	258
Test at	**°C**	**-160**	**-120**	**-80**	**-40**	**0**	**+40**	**+80**

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

R	N/mm²	610	800	1000	1200	1320	1480	1600	1750
Rp 0.2	N/mm²	240	550	740	880	1020	1200	1320	1450
A	%	40	20	16	10	8	8	8	6
permeability	μr	1.005	1.06	1.64	3.44	-	-	-	-
Reduction	**%**	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**

X8CrNiS18-9 **n° 1.4305** austenitic stainless steel *Lucefin Group*

Thermal expansion	$10^{-6} \cdot K^{-1}$	►	16.0	16.5	17.0	17.5		
Modulus of elasticity	longitudinal GPa	200	194	186	179	172		127
Poisson number	*v*	0.24	0.256					
Electrical resistivity	$\Omega \cdot mm^2/m$	0.73		0.86		0.97		1.15
Electrical conductivity	$Siemens \cdot m/mm^2$	1.37						
Specific heat	$J/(Kg \cdot K)$	500		510		550	585	630
Density	Kg/dm^3	7.90						
Thermal conductivity	W/(m•K)	15.3	16.3	17.5	19.9	21.5		25.1
Relative magnetic permeability	μr	1.021						
°C		**20**	**100**	**200**	**300**	**400**	**600**	**800**

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

Corrosion resistance	Atmospheric		Chemical			**x** food and organic substances, 5% nitric acid
Fresh water	*industrial*	*marine*	*medium*	*oxidizing*	*reducing*	
x	**x**	**x**	**x**			

Magnetic	not
Machinability	high
Hardening	cold-drawn and other cold plastic deformation
Service temperature in air	continuous service up to 870 °C; intermittent service up to 760 °C

Europe EN	**USA** UNS	**USA** ASTM	**China** GB	**Russia** GOST	**Japan** JIS	**India** IS	**Republic of Korea** KS
X8CrNiS18-9	S30300	**303**	Y1Cr18Ni9	12Ch18N10E	SUS 303		STS 303

Tensile strength/corrosion resistance approximate scale