

Quality	X8CrNiS18-9	Austenitic
Number	1.4305	Stainless Steel

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Ni%	N%	Cu%	
max	max	max	max				max	max	Deviations allowed for analysis product
0,10	1,00	2,00	0,045	0,15-0,35	17,0-19,0	8,0-10,0	0,11	1,00	
± 0.01	+ 0.05	± 0.04	+ 0.005	± 0.02	± 0.2	± 0.1	± 0.01	± 0.07	

Product deviations are allowed

Temperature °C

Melting range	Hot-forming	Solution annealing (Solubilization)	Stabilizing	MMA welding – AWS electrodes
1420-1400	1200-900	1150-1040 water / air	not necessary	<i>pre-heating</i> not recommended <i>post welding</i> joint with steel
Sensitization	Quenching	Tempering	Soft annealing	carbon butter E309 - E312, finish with E308 cosmetic welding E308 – E312
sensitization test at 800-450	not suitable	not suitable	not suitable	CrMo alloyed the same as carbon steels stainless E308 - E312

Mechanical properties

Hot-formed EN 10088-3: 2005 in conditions 1C, 1E, 1D, 1X, 1G, 2D

size		Testing at room temperature						
mm		R	Rp 0.2	A% (L)	A% (T)	Kv +20 °C (L)	Kv +20 °C (T)	HB a)
from	to	N/mm ²	N/mm ² min	min		J min	J min	max
	160	500-750	190	35				230 +AT solubilization

a) for information only (L) = longitudinal (T) = transversal

Cold-processed EN 10088-3: 2005 in conditions 2H, 2B, 2G, 2P

size		Testing at room temperature						
mm		R	Rp 0.2	A% (L)	A% (T)	Kv +20 °C (L)	Kv +20 °C (T)	
from	to	N/mm ²	N/mm ² min	min	min	J min	J min	
	10 ^{b)}	600-950	400	15				+AT solubilization
10	16	600-950	400	15				
16	40	600-850	190	20		100		
40	63	500-850	190	20		100		
63	160	500-750	190	35		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 (ASTM A 473-99 steel ASTM 303)

size		Testing at room temperature						
mm		R	Rp 0.2	A% (L)	C%	Kv +20 °C (L)	Kv +20 °C (T)	
from	to	N/mm ² min	N/mm ² min	min	min	J min	J min	
		515	205	40	50			+AT solubilization

Work-hardened by cold-drawing EN 10088-3: 2005 in condition 2H (ex. +AT+C)

size		Testing at room temperature				
mm		R	Rp 0.2	A%		
from	to	N/mm ²	N/mm ² 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/mm ²	610	660	670	695	745	765	795	815	855	895	940
R _{p0.2}	N/mm ²	240	400	450	470	520	540	560	580	630	650	720
A	%	40	22	20	20	18	16	16	14	14	12	12
Reduction %		0	5	6	8	10	12	14	16	18	20	24

X8CrNiS18-9 n° 1.4305 austenitic stainless steel

Thermal expansion	10 ⁻⁶ • K ⁻¹	▶	10.5	11.0	11.5	12.0	18.8	
Modulus of elasticity	longitudinal GPa	200	194	186	179	172	127	
Poisson number	ν	0.240	0.256					
Electrical resistivity	Ω • mm ² /m	0.73		0.86		0.97	1.15	
Electrical conductivity	Siemens • m/mm ²	1.37						
Specific heat	J/(Kg • K)	500		510		550	585	630
Density	Kg/dm ³	7.84						
Thermal conductivity	W/(m • K)	15.3	16.3	17.5	19.9	21.5	25.1	
Relative magnetic permeability	μ _r	1.021						
Temperature	°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	<i>industrial</i>	<i>marine</i>	<i>medium</i>	<i>oxidizing</i>	<i>reducing</i>	
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	USA	USA	China	Russia	Japan	India	Republic of Korea
EN	UNS	ASTM	GB	GOST	JIS	IS	KS
X8CrNiS18-9	S30300	303	Y1R18Ni9	12Ch18N10E	SUS 303		STS 303

Tensile strength/corrosion resistance approximate scale

