



MATERIAL No.: TP310S/ S31009/ 1.4845

DESCRIPTION

EN symbol (short)	X12CrNi 25-21	Density kg/dm³	7,9
AISI	AISI 310 S	Hardness HB 30	<= 192
UNS	S 31008 Grade TP 310 S	Composition	
UNS	S 31009 Grade TP 310 H	Category	Heat resistant steels and alloys
AFNOR	Z 12 CN 25-20	Structure	austenitic
BS	310 S 24	Additional characteristics	low durability in oxidising and reducing atmosphere forge scale temperature 1922 °F

CHEMICAL COMPOSITION

		C	Si	Mn	Cr	Ni	P	S	N	Mo
1.4845	Min %				24,00	19,00				
	Max %	0,10	1,50	2,00	26,00	22,00	0,045	0,015	0,11	
(Key to steel 2010)										
AISI 310 S	Min %				24,00	19,00				
S 31008	Max %	0,08	1,00	2,00	26,00	22,00	0,045	0,030		0,75
UNS :S 31008 (ASTM A 312-TP 310 S)										
S 31009	Min %	0,04			22,0	12,0				
	Max %	0,10	1,00	2,00	24,0	15,0	0,45	0,030		0,75
UNS S31009 (ASTM A 213-TP 310 H)										

PHYSICAL PROPERTIES

Property	Value
Density: kg/dm³	7,9
Hardness: HB 30	<= 192

Magnetizable		no			
Temperature T °C/F (°C/F)	Specific heat J / kgK (Btu / lb °F)	Thermal conductivity W/mK (Btu·in / ft²·h·°F)	Electric resistance μΩ · cm (Ω circ mill / ft)	Modulus of elasticity kN/mm² (10³ ksi)	Expansion rate from 70°F bis T 10⁻⁶ / K (10⁻⁶ / °F)
20 / 68	500 (--)	15 (--)	0,93 (--)	195 (--)	16,5 (--)
100 / 212			0,93 (--)	195 (--)	16,5 (--)
200 / 392			1,03 (--)	182 (--)	17,0 (--)
400 / 752			1,22	170 (--)	18,0 (--)
500 / 932		19 (--)			
600 / 1112			1,37 (--)	155 (--)	18,5 (--)
1000 / 1832			1,45 (--)	120 (--)	19,5 (--)
Temp.	Creep strain limit	Creep strain limit	Creep rupture strength	Creep rupture strength	Creep rupture strength
°C/°F	1% (10 000h)		10 000 h	100 00 h	
°C/°F	N/mm² /ksi		N/mm² /ksi	N/mm² /ksi	
500 / 932					
600 / 1112	90 / 13,0		130 / 18,8	80 / 11,6	
700 / 1292	30 / 4,3		40 / 5,8	18 / 2,7	
800 / 1472	10 / 1,45		18 / 2,6	7 / 1,0	
900 / 1652	4 7 0,6		8,5 / 1,2	3 / 0,4	

MECHANICAL PROPERTIES (20°C / 68°F)

tensile elastic limit Re (Mpa)	>=210
Tensile strength Rm (Mpa)	500-700
Elongation A5 (%)	>=35

TEMPERATURE INFORMATION

Application area	
Operation temperature	°F to 1922 °F
Explanation report	scaling resistance (air) up to 1922°F
Solution heat treatment	

Working temperature	1922 °F to 2012 °F
Solution heat treatment	
Working temperature	2102 °F to 1472 °F
Explanation report	fast cooldown :air

STANDARDS / INFORMATION

Standards	Description
ASTM A 213	Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler,Superheater,and Heat-Exchanger Tubes
ASTM A 276	Rods and cross-sections made of stainless and heat-resistant steel
ASTM A 312	Standard Specification for Seamless and welded austenitic stainless steel pipes
DIN EN 10088-1 (09/2005)	Stainless steels Part 1: List of stainless steels
DIN EN 10095 (05/1999)	heat resistant steel and nickel alloy
DIN EN 10297-2 (02/2006)	Welded circular steel pipes for machine construction and general technical service stainless steel. Pipes made from stainless steel
SEW 470 (02/1976)	heat-resisting rolled and forged steels

PROCESS INFORMATION

Chip removing process	requires slow cutting speed due to cold work hardening don't break contact with cutting tool
Welding	
- Type	well weldable WIG MAG solid wire manual arc welding (E)
- Add. material	1.4842
- Hints	no heat treatment necessary before or after welding process

MAIN FIELDS OF APPLICATION

Details of application	thermo technical facilities with increased scaling resistance (up to 1922°F)
Certifications	
industrial furnace engineering	furnace parts annealing tubes muffle pipes
Power plants	
petrochemical industry	
crude oil	

RANGE OF PRODUCTS

Product type	Product
Plates / Sheets	plates/sheets plate/sheet cuts
Fittings	welded elbows welded reductions Welded T-pieces seamless elbows seamless reductions seamless T-pieces
Flanges / Collars / Flared tube ends	various flanges (weld neck flange, blind flange etc.)
Round bar	peeled
Bar steel	flat steel round bar steel

[Pipe/Tube/Fitting/Flange/Valve/Plate](#)

Stainless Steel/Nickel Alloy/Duplex

