

SALOMON'S METALEN B.V.

310 310S

Grade 310 (UNS S31000) and its various subgrades combine excellent high temperature properties with good ductility and weldability.

Grade 310S (UNS S31008) is used when the application environment involves moist corrosive in a temperature range lower than that which is normally considered "high temperature" service.

Corrosion Resistance

The high chromium content - intended to increase high temperature properties - also gives these grades good aqueous corrosion resistance. The PRE is approximately 25, and sea water resistance about 22°C, similar to that of Grade 316. In high temperature service they exhibit good resistance to oxidising and carburising atmospheres. Resist fuming nitric acid at room temperature and fused nitrates up to 425°C. The high carbon contents do make these grades susceptible to sensitisation and hence intergranular corrosion after elevated temperature exposure or welding. 310 is subject to stress corrosion cracking but more resistant than Grades 304 or 316.

Heat Treatment

Solution Treatment (Annealing)

Heat to 1040-1150°C and cool rapidly for maximum corrosion resistance. This treatment is also recommended to restore ductility after each 1000 hours of service above 650°C, due to long term precipitation of brittle sigma phase.

These grades cannot be hardened by thermal treatment.

Welding

Good characteristics suited to all standard methods.

"Dual Certification"

310S is often produced in "Dual Certified" form - mainly in plate and pipe.

Typical Applications

Furnace parts. Oil burner parts. Carburising boxes. Heat Treatment baskets and jigs. Heat exchangers. Welding filler wire and electrodes.

Specified Properties

These properties are specified for flat rolled product (plate, sheet and coil) in ASTM A240 (310S) and ASTM A167 (310). Similar but not necessarily identical properties are specified for other products such as pipe and bar in their respective specifications.

Limitation of Liability

The information contained in this datasheet is not an exhaustive statement of all relevant information. It is a general guide for customers to the products and services available from Salomon's Metalen B.V. and no representation is made or warranty given in relation to this document or the products or processes it describes.

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Composition Specification (%) (single values are maxima)

Grade		C	Mn	Si	P	S	Cr	Mo	Ni	N
310	min.	-	-	-	-	-	24.0	-	19.0	-
	max.	0.25	2.00	1.50	0.045	0.030	26.0	-	22.0	-
310S	min.	-	-	-	-	-	24.0	-	19.0	-
	max.	0.08	2.00	1.50	0.045	0.030	26.0	-	22.0	-

Mechanical Property Specification

Grade	Tensile Strength (MPa) min	Yield Strength 0.2% Proof (MPa) min	Elongation (% in 50mm) min	Hardness	
				Rockwell B (HR B) max	Brinell (HB) max
310	515	205	40	95	217
310S	515	205	40	95	217

Physical Properties (typical values in the annealed condition)

Grade	Density (kg/m³)	Elastic Modulus (GPa)	Mean Coefficient of Thermal Expansion			Thermal Conductivity		Specific Heat (J/kg.K)	Electrical Resistivity (nΩ.m)
			0-100°C (µm/m/°C)	0-315°C (µm/m/°C)	0-538°C (µm/m/°C)	at 100°C (W/m.K)	at 500°C (W/m.K)		
310/S/H	7750	200	15.9	16.2	17.0	14.2	18.7	500	720

Grade Specification Comparison

Grade	UNS No	Euronorm		Swedish SS	Japanese JIS
		No	Name		
310S	S31008	1.4845	X8CrNi25-21	2361	SUS 310S

Possible Alternative Grades

Grade	Why it might be chosen instead of 310
321	Heat resistance is needed, but only to about 900°C. Subsequent aqueous corrosion resistance also required.
253MA	A slightly higher temperature resistance is needed than can be provided by 310. Better resistance to reducing sulphide atmosphere needed. Higher immunity from sigma phase embrittlement is required.

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