UNS S31803 / 1.4462 / F51

Technical Datasheet

Duplex Stainless Steel

Service. Quality. Value.

Product Description

Material to UNS S31803 (and the other specifications listed below) is described as a duplex stainless steel with a microstructure of 50:50 austenite and ferrite. The steel combines good mechanical strength (typically up to over 480 MPa yield strength) and ductility with moderate to good corrosion resistance in a variety of environments. By agreement, the alloy can be supplied with a PREN (Pitting Resistance Equivalent) at >34 which ensures that the resistance to pitting corrosion is as high as possible for this alloy grade. In addition, the steel offers good resistance to stress corrosion cracking. Ambient and sub-zero temperature notch ductility is good. These attributes mean that this duplex steel can be used successfully as an alternative to 300 series stainless steels in applications where higher mechanical strength / lower weight is required and / or resistance to stress corrosion cracking is needed.

Availability

Bar, forgings, sheet, plate, pipe, tube, closed die forgings, flanges and welding consumables.

Machinability / Welding

The machining and welding of this grade of duplex stainless steel presents no particular problems. Guidance notes are available upon request.

Typical Applications

Pumps, valves, chokes, Xmas trees, pipework / flanges, bolting, connectors & manifolds. In oil and gas industry. Equipment in brewing, power generation and chemical engineering.

Related Specifications

- UNS S31803 in various ASTM product form specifications
- EN 10088-3 1.4462 (Grade X2CrNiMoN22-5-3)
- NORSOK MDS D41 to D45, D47 & D48
- ASTM A182 F51
- NACE MR01-75 / ISO 15156

Chemical Composition (weight %)

Weight (%)	C	Mn	Si	S	P	Cr	Ni	Mo	N	*PreN
Min						21.0	4.5	2.5	0.10	33 - 34 Typical
Max	0.03	2.00	1.00	0.015	0.035	23.0	6.5	3.5	0.22	

* PREn = Cr % + 3.3Mo% + 16N%

Minimum Mechanical Properties at Room Temperature

(EN 10088-3 1.4547 max diameter 160mm - Solution Treated)

Ultimate Tensile Strength	650 – 880 MPa	(94 – 128 ksi)
0.2% Proof Strength	450 MPa	(65 ksi)
Elongation	25 %	
Hardness (Max)	270 HB	
Impact	100 J	(74 ft.lb)

Typical Properties

Density	7.8	kg/dm³
Specific Thermal Capacity at 20°C	500	$J.Kg^{-1}.K^{-1}$
Mean Coefficient of Thermal Expansion at 20 - 100°C	13.0	$x\ 10^{-6}K^{-1}$
Thermal Conductivity at 20°C	15	$W.m^{-1}.K^{-1}$
Electrical Resistivity at 20°C	0.80	$\Omega.mm^2.m^{-1}$
Modulus of Elasticity at 20°C	200	GPa
Magnetisable	No*	

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Quality & Testing:

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www.smithmetal.com info@smithmetal.com