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UNS S31803 Duplex Stainless Steel

UNS S31803 duplex stainless steel stockholders and suppliers, delivering to the whole of the UK. West Yorkshire Steel are suppliers of UNS S31803, a chromium nickel molybdenum austenitic ferritic grade. It combines improved resistance to stress corrosion cracking, pitting, crevice corrosion and high strength in comparison with other stainless steel grades. UNS S31803 grade duplex resists chloride environments and sulphide stress corrosion. It is approximately double the yield strength of standard austenitic stainless steel grades. As with other duplex stainless steel specifications oxidation resistance is good at high temperature, though it is prone to embrittlement when exposed to temperatures above 300°C and is prone to embrittlement at 475°C when exposed for 2 hours only. It is also subject to embrittlement between 370-540°C when exposed over a longer period.

We welcome export enquiries for stainless steel. Contact our sales office and consult our shipping policy for further details.

Related Specifications

1.4462 BS EN 10088-3 ASTM A182 F51 X2CrNiMoN22-5-3

Alternative stainless grades we supply

17/4PH | FV520B | S31254 | 904L | 310 | 316 | 321 | 440B | 440C | 420 | 410 | 416 | 431 | S32760

Form of Supply

West Yorkshire Steel are suppliers and stockholders of round bar. Also available is UNS S31803 plasma cut duplex stainless plate and sheet. UNS S31803 duplex stainless steel ground steel bar can be supplied, providing a high quality stainless precision ground diameter bar to close tolerances.

- Plate
- Diameter

Applications

UNS S31803 duplex can be used successfully as an alternative to standard stainless steel specifications in applications where higher strength and resistance to stress corrosion cracking is required. Widely used in the brewing, power generation, marine, petrochemical and chemical engineering industries. Typical applications include bushes, flanges, shafts and fasteners.

Analysis

Carbon	0.03% max	Chromium	21.00-23.00%
Manganese	2.00% max	Nickel	4.50-6.50%
Silicon	1.00% max	Molybdenum	2.50-3.50%
Sulphur	0.015% max	Nitrogen	0.10-0.22%
Phosphorous	0.035% max		

Corrosion Resistance

UNS S31803 is resistant to intergranular corrosion. It has better corrosion resistance than that of other austenitic stainless grades such as 316, with higher resistance to stress corrosion cracking to that of either 304 or 316 stainless grades. Pitting corrosion and crevice corrosion is higher than that of 316. Due to its higher corrosion resistance UNS S31803 has better fatigue strength in corrosive environments than that of other austenitic stainless steel specifications.

Welding

UNS S31803 (1.4462, F51) has good weldability similar to that of other stainless steel types. Low thermal expansion reduces residual stresses after welding. Use duplex welding electrodes similar to that of the parent steel when welding UNS S31083. Electric arc welding processes are suitable though oxyacetylene welding is not recommended due to the possibility of carbon pick up in the weld area of the UNS S31803. Whilst post weld annealing is not a requirement for many applications it will give optimum corrosion resistance in severe service conditions. We recommend you contact your welding consumables supplier who should provide you full assistance and information of welding UNS S31803 duplex.

Typical Physical Properties

Temp ºC	Density Kg/m³	Mean Coefficient of Thermal Expansion at 20-100°C	Thermal Conductivity $W.m^{-1}.°C$	Modulus of Elasticity GPa	Specific Thermal Capacity $J.Kg^{-1}.K^{-1}$
20	7.80	13.0x10-6	16	200	500

Typical Mechanical Properties*

Tensile UTS N/mm²	0.2% Proof Stress N/mm² min	Elongation % min	Hardness HB max	Impact J
650-880	448	25	290	100

*Mechanical Properties at room temperature (160mm dia max - solution treated)

Heat Treatment

UNS S31803 (1.4462, F51) cannot be hardened by conventional heat treatment, though it is a work hardening steel. Duplex can be solution annealed at 1020-1100ºC, water quench.

Certification

Duplex stainless steel grade UNS S31803 is available with BS EN 10204 3.1 mill certificate, please request when placing any orders.

Quality Assured Supply

UNS S31803 duplex stainless is supplied in accordance with our ISO 9001:2015 registration.