

UNS S31803 F51 – Duplex Stainless Steel

Specifications :

EN10088-3 X2CrNiMoN22-5-3 ASTM A182 F51 W.Nr. 1.4462 NORSOK D41 to D45

F51 is a duplex stainless steel with a 50:50 austenite, ferrite microstructure. The material combines good mechanical strength and ductility with moderate to good corrosion resistance in a variety of environments. This material is generally supplied in the annealed condition giving yield strengths in excess of 65 KSI (450Mpa), this material cannot be hardened by heat treatment but stronger surface strengths can be achieved by cold working. Typical applications include pumps, valves, pipework, flanges etc together with various applications in the oil and gas, brewing, power generation and chemical engineering industries. In fact this alloy can be used successfully as an alternative to 300 series austenitic stainless steels in almost all applications where higher mechanical strength/lower weight is required.

Forging

Forging temperature for this material should be 1100 – 1250oC Reheat as often as necessary and cool in still air.

Machining

Material in the annealed condition is readily machinable by all conventional methods.

Welding

F51 is readily weldable using many of the standard electric arc welding processes but oxyacetylene welding is not recommended because carbon pickup in the weld metal may occur.

Heat Treatment

Anneal – Heat to 1020 – 1120oC ensuring sufficient time is allowed for the centre to achieve furnace temperature and hold for a time commensurate with the ruling section, followed by water quenching.

ASTM A182 F51 – Duplex Stainless Steel

ASTM A182 F51 is a duplex stainless steel that offers a high resistance to general, pitting, stress and crevice corrosion, as well as a high mechanical strength and good weldability. As a result, this is a highly suitable material for applications dealing with environments containing chlorides and and hydrogen sulphide.

ASTM A182 F51 UNS S31803 1.4462 X2CrNiMoN 22 5 3 Z3CND22 05 Az SUS 329J3L

Chemistry Of Duplex Stainless Steel.

Element	Min	Max
C (Carbon)		0.03%
Cr (Chromium)	21%	23%
Mn (Manganese)		2%
Mo (Molybdenum)	2.5%	3.5%
N (Nitrogen)	0.08%	0.2%
Ni (Nickel)	4.5%	6.5%
P (Phosphorous)		0.03%

ASTM A182 F51 Flanges Chemical Composition

Chemical Composition % Of ASTM A182 F51 Flanges

Chemical Compo	sition Lim	its							
Weight%	C	Mn	P	S	Si	Cr	Ni	Mo	N
Duplex F51	0.03 max	2.0 max	0.03 max	0.02 max	1 max	21-23	4.5-6.5	2.5-3.5	0.80-0.20
Mechanical Properties Min						Max			
Ultimate Tensile Strength (UTS)				620 MPa					
Yield Strength				450 MPa					
Elongation 25%									
Gauge Length A50mm									

Mechanical Properties Of ASTM A182 F51 Flanges

Alloy	Tensile Strength N/mm ²	Proof Strength 0.2% N/mm ²	Elongation (%)	Hardness Brinell
F51	105	55	35	170-255

Applications

Pressure Systems.

Flanges

Valves Fittings

Couplings

Rings

Shafts

Forgings.

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Applications
Pressure Systems.
Flanges
Valves Fittings
Couplings
Rings
Shafts
Forgings.