

UNS S32750 F53 – Super Duplex Stainless Steel

Related Specifications

EN10088-3 X2CrNiMoN25-7-4

ASTM A182 F53

W.Nr. 1.4410

NORSOK D51 to D55

F53 is a super duplex stainless steel with a 50:50 austenite, ferrite microstructure. The material combines high mechanical strength and good ductility with excellent corrosion resistance in a variety of environments. This material is generally supplied in the annealed condition giving yield strengths in excess of 80 KSI (550Mpa), this material cannot be hardened by heat treatment but stronger surface strengths can be achieved by cold working. This alloy is generally supplied with a Pitting Resistance Equivalent (PREn) of greater than 40 which guarantees high resistance to pitting corrosion. In addition high resistance to crevice and stress corrosion coupled with the increased strength give this alloy the advantage over the austenitic (300 series) and 22%Cr duplex stainless steels. Typical applications include many components for the chemical processing, marine, oil and gas, pollution control and food industries amongst others.

Typical Chemical composition

PREn = Pitting Resistance Equivalent PREn= Cr% + 3.3Mo% + 16N%	Carbon	0.03% Max
	Silicon	0.80% Max
	Manganese	1.20% Max
	Phosphorous	0.035% Max
	Sulphur	0.015% Max
	Chromium	24.0 – 26.0%
	Nickel	6.0 – 8.0%
	Molybdenum	3.0 – 5.0%
	Copper	0.50% Max
	Nitrogen	0.24 – 0.32%
	PREn	>40

Mechanical Property Requirements - Annealed condition

Yield	Tensile Strength	Elongation	Charpy Impact @ Rt J	Hardness
>550Mpa (80KSI)	600 – 930Mpa (116 – 135KSI)	15%	100	301HB Max

Forging

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

Heat Treatment

Anneal – Heat to 1025 – 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.

Machining

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

Welding

F53 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.