

## SUPER DUPLEX STAINLESS STEEL

### TYPICAL APPLICATIONS

Pumps, valves, chokes, Xmas trees, pipework / flanges, bolting, connectors & manifolds. In oil and gas industry. Equipment in defence, chemical and marine industries.

### PRODUCT DESCRIPTION

Material to UNS S32760 (and the other specifications listed below) is described as a super duplex stainless steel with a microstructure of 50:50 austenite and ferrite. The steel combines high mechanical strength (typically up to 600 MPa yield strength) and good ductility with outstanding corrosion resistance to marine environments and a wide, diverse range of oil & gas production environments. The alloy is supplied with a PREn (Pitting Resistance Equivalent) at >40.0 which guarantees high resistance to pitting corrosion. In addition, the steel offers high resistance to crevice corrosion and stress corrosion cracking. Ambient and subzero (down to minus 50°C) notch ductility is good. These attributes mean that this super duplex steel can be used successfully as an alternative to 300 series stainless steel (such as type 316), standard 22%

Cr duplex steel and precipitation hardening stainless steels. Where appropriate the alloy can be considered in lieu of more costly Grade 5 titanium or nickel based alloys.

### AVAILABILITY

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

### MATERIAL SPECIFICATIONS

- UNS S32760 in various ASTM product form specifications
- EN 10088-3 1.4501 (Grade X2CrNiMoCuWN25-7-4)
- NORSOK MDS D51 to D55, D57 & D58
- ASTM A182 F55
- NACE MR01-75 (latest revision) / ISO 15156

### MACHINABILITY / WELDING

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

### CHEMICAL COMPOSITION %

Weight (%)	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N	W	PREn
Min.						24.0	6.0	3.0	0.50	0.20	0.50	40.0
Max	0.03	1.00	1.00	0.015	0.035	26.0	8.0	4.0	1.00	0.30	1.00	

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

### MINIMUM MECHANICAL PROPERTIES AT ROOM TEMPERATURE (EN 10088-3 1.4501 MAX DIAMETER 160mm – SOLUTION TREATED)

Ultimate Tensile Strength	730 – 930 MPa	( 106 – 135 ksi )
0.2% Proof Strength	530 MPa	( 77 ksi )
Elongation	25 %	
Hardness (Max)	290 HB	
Impact	100 J	( 74 ft.lb )

### TYPICAL PHYSICAL PROPERTIES

Density	7.8	kg/dm <sup>3</sup>
Specific Thermal Capacity at 20°C	500	J.Kg <sup>-1</sup> .K <sup>-1</sup>
Mean Coefficient of Thermal Expansion at 20 - 100°C	13.0	x 10 <sup>-6</sup> K <sup>-1</sup>
Thermal Conductivity at 20°C	15	W.m <sup>-1</sup> .K <sup>-1</sup>
Electrical Resistivity at 20°C	0.80	Ω .mm <sup>2</sup> .m <sup>-1</sup>
Modulus of Elasticity at 20°C	200	GPa
Magnetisable	Yes	