

## Duplex Steel F51 (UNS S31803) / F60 (UNS 32205) / 1.4462

A duplex austenitic-ferritic chromium-nickel-molybdenum stainless steel.

F51 Duplex Stainless Steel combines improved resistance to stress corrosion cracking, pitting, crevice corrosion and high strength. Due to its chemical composition F51 duplex stainless steel resists chloride environments and sulphide stress corrosion.

### Technical challenges

We can effectively control the temperature at the beginning and end of the forging process, as well as manage the temperature during solution treatment, ensuring it meets the requirements for low-temperature impact.

### Chemical Composition Limits

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

### EN 10088-3

Mechanical Property	Value
Proof Stress	450 Min MPa
Tensile Strength	650 to 880 MPa
Elongation A50 mm	25 Min %
Hardness Brinell	270 Max HB
Physical Property	Value
Density	7.805 g/cm <sup>3</sup>
Thermal Expansion	13.7 x10 <sup>-6</sup> /K
Modulus of Elasticity	200 GPa
Thermal Conductivity	19.0 W/m.K
Electrical Resistivity	0.85 x10 <sup>-6</sup> Ω .m

### Availability

Duplex F51 is available in Plate, Sheet, Round Bar, Flat Bar and Forging Stock for sizes contact Sales.

### Specifications

ASTM A182 F51 / F60

ASTM A276 F51 / F60  
ASTM A479 F51  
AISI F51  
BS 318S13 (Wrought)  
BS 332C15 (Cast)  
WS 1.4462  
WS 1.4470  
X2CrNiMoN22.5.3  
AFNOR Z2CND22.05Az  
UNS S31803  
UNS S32205  
SAF2205 - SANMAC (Brand name)  
URANUS 45N (Brand name)  
FALC223 (Brand name)

### Characteristics

Higher strength than standard stainless steels  
Higher corrosion resistance than Alloy 316L stainless steel in a wide variety of corrosive chemicals including sulphuric, phosphoric and nitric acids  
Good resistance to pitting and crevice corrosion in seawater  
High stress corrosion resistance  
Lower thermal expansion than austenitic stainless steels  
Higher thermal conductivity than austenitic stainless steels

### Applications

- Process industry components in sulphuric acid, nitric acid, phosphoric acid, ethylene oxide, polypropylene & PVC production
- Equipment handling organic & fatty acids, chemical storage, tankers, heat exchangers
- Marine industry and shipbuilding propellers, shafts, rudders, shaft seals, pumps, bolts, fasteners, valves, instrumentation
- Oil and chemical tankers
- Oil & Gas industry pumps, valves, pipe, vessels, wellhead equipment, subsea equipment, separators, heat exchangers
- Pollution control systems, effluent scrubbing, flue gas desulphurisation (FGD)
- Waste water treatment, sour water purification
- Pulp & paper industry applications such as pulp liquor heaters, bleach tower linings, digesters, brownstock washers
- Food industry applications including brewery piping, evaporators, hot liquor tanks, presses

