



BRODER METALS GROUP UNS S31803 F51

F51 combines improved resistance to stress corrosion cracking, pitting, crevice corrosion and high strength when compared with other stainless alloys. F51 resists chloride environments and sulphide stress corrosion.

Typical applications in the power generation and oil & gas industry include pumps, valves, pipework, flanges, bolting, connectors & manifolds.

Duplex & Super Duplex Steels

The word *duplex* is based upon the concept that the material has a two-phase microstructure consisting of grains of ferritic and austenitic stainless steel formulated in the same material. The term "Super-Duplex" denotes high-performance Duplex steel based on elevated contents of chromium, nickel and molybdenum. These elements improve pitting corrosion resistance, while additions of nitrogen promoted structural hardening, raising the yield strength and ultimate strength values without impairing toughness.

Duplex stainless steels are about twice as strong as regular austenitic or ferritic stainless steels, have significantly better toughness and ductility than ferritic grades (although they do not reach the values of austenitic grades), have a range of corrosion resistance comparable to the range for austenitic stainless steels, have very good stress corrosion cracking resistance.

Properties:

Melt practice: E+AOD or equivalent

Heat Treatment & finish condition: Annealed & Peeled/Polished

Chemical analysis

	C	Cr	Fe	Mo	Mn	N	Ni	P	S	Si
Min	-	21	Balance	2.5	-	0.1	4.5	-	-	-
Max	0.03	23		3.5	2	0.22	6.5	0.04	0.015	1

Mechanical Properties

Tensile Strength (MPa /N/mm ²)	655-880
0.2% Proof Stress (MPa /N/mm ²) minimum	485
Elongation (A5 & 4D) minimum	25.00%

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Mechanical Properties (continued)

Reduction of Area minimum	45.00%
Hardness (HB) maximum	270
Charpy V-notch Impact at ambient Temp (J)	100 minimum
Charpy V-notch Impact at -46 deg C (J)	45 minimum
Ultrasonic Testing	At customer;s request
Ferrite Content	35%-55%
Corrossion Test to ASTM G48 Method A	25 deg C for 24 hours
Microstructure	Microstructure certified free from grain boundary carbides, sigma, chi and laves phases

F51 is just one of a range of corrosion resistant materials stocked by Broder Metals Group Ltd – please see our website for the full range stocked: www.broder-metals-group.com.

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