

# Duplex

Prochem Pipeline Products, offer a comprehensive range of Duplex UNS S31803 & Super Duplex UNS S32750 / UNS S32760 TUBE, PIPE, FITTINGS and FLANGES to suit Australian Industry. Duplex in these forms are available either through stocks held in Australia or through our worldwide network of stockists and mill manufacturers.



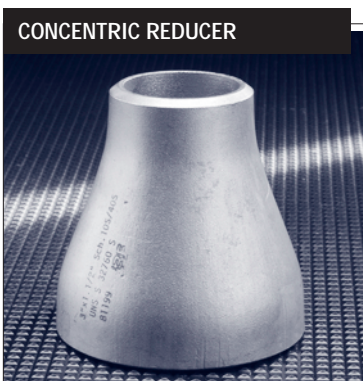
We have a Duplex piping product to suit your particular application – so please contact our staff at your nearest Prochem office.

Duplex Stainless Steels are unlike the 300 (Austenitic) and 400 (Ferritic) series of stainless steels in that they have a structure consisting of approximately equal amounts of both ferrite and austenite. Therefore, they are often referred to as ferritic-austenitic stainless steels.

With a chromium content ranging from 18 to 28 percent, they have improved passivity compared to standard grades. The nickel content ranges from 4.5 to 8 percent which is insufficient to promote a complete austenitic crystal structure, hence the mixed ferrite-austenite structure. Most grades contain molybdenum in the range of 2.5 to 4 percent plus small amounts of nitrogen – enhancing both strength and pitting resistance.

## PIPE





**Basic properties of Duplex stainless steels include:**

- Duplex crystal structure of ferrite and austenite resulting in a high resistance to stress corrosion cracking.
- Increased passivity due to the higher Chromium, Molybdenum and Nitrogen contents.
- Good weldability and formability.
- Higher tensile and yield strength compared with the austenitic and ferritic stainless steels.
- Improved uniform corrosion resistance.

**Design Features**

- High strength – S31803.
- Very high strength – S32750/60.
- High/very high pitting and crevice corrosion resistance – S31803/S32750.
- High resistance to stress corrosion cracking, corrosion fatigue and erosion – S31803.
- Very high resistance to stress corrosion cracking and uniform corrosion – S32750/60.
- Good sulphide-stress corrosion cracking resistance – S31803.
- High/very high uniform corrosion resistance – S31803/S32750.

- Low thermal expansion and higher thermal conductivity than austenitic stainless steels – S31803 and S32750/60.
- Good weldability – S31803 and S32750.
- High energy absorption S31803 and S32750.

**Typical Applications:**

- Shell and Tube Heat Exchangers offshore – S31803 and S32750.
- Heat exchangers and pipes in desalination plants – S31803 and S32750/60.
- Offshore process systems – S31803 and S32750.
- Offshore Seawater systems – S32750.
- Pressure vessels, pipes, tanks and heat exchangers for processing and transport of various chemicals – S31803.
- Pressure vessels, tanks and pipes in process industries handling solutions containing chlorides – S31803.
- Mechanical and structural components demanding high strength coupled with high corrosion resistance – S32750.

**DUPLEX GRADES AND THEIR APPLICATIONS**

UNS No.	Forms Available*	C	Typical Compositions (%)						Typical Applications
			Cr	Ni	Mo	N	Cu	W	
S32304	Sheet, Plate, Pipe, Fittings	0.03	23.0	4.0	-	0.1	-	-	Similar corrosion resistance to 316L. Higher yield strength and stress-corrosion cracking resistance. Used where high corrosion resistance is required in marine, mining, chemical, food and power industries. Particularly useful in nitric acid.
S31803 S32205	Plate, Pipe, Bar, Fittings	0.03	22.0	5.5	3.0	0.14	-	-	Superior corrosion resistance to 316L and 317L, combined with high strength. Excellent stress corrosion and abrasion resistance. Typically used in heat exchangers, gas scrubbers, fans, chemical tanks, flowlines, marine and refinery applications.
S32550	Plate, Sheet, Pipe, Bar, Fittings	0.03	25.0	5.5	3.0	0.15	2.0	-	Excellent resistance to corrosion by seawater, acids and salts combined with high strength, abrasion resistance and weldability.
S32750	Plate, Pipe, Bar, Fittings	0.03	25.0	7.0	4.0	0.3	-	-	Extremely high resistance to corrosion in severe marine, chloride and acid environments. Suitable for heat exchangers, reactors, pipework, etc.
S32760	Plate, Pipe, Bar, Fittings	0.02	25.0	7.0	3.5	0.25	0.7	0.7	Extremely high resistance to corrosion in severe marine, chloride and acid environments. Suitable for heat exchangers, reactors, pipework, etc.
S32520	Plate, Pipe, Bar, Fittings	0.02	25.0	6.5	3.5	0.25	1.6	-	Extremely high resistance to corrosion in severe marine, chloride and acid environments. Suitable for heat exchangers, reactors, pipework, etc.

\*Compatible or equivalent grades also available in castings.