

DUPLEX 31803 / UNS S31803 / DIN 1.4462

Ferritic-austenitic stainless steel

31803 Data Sheet

Introduction

31803 is the most widely used duplex stainless steel grade. It complies excellent corrosion resistance and high strength. 2205 is not generally suitable for use at temperatures above 300°C as it suffers from precipitation of brittle micro-constituents, nor below -50°C because of its ductile-to-brittle transition. It also has high resistant to stress and provides a low level of thermal expansion.

Chemical Composition (Typical)

| Element | Limits | |
|------------|-----------|--------|
| | min | max |
| Carbon | 0.000 | 0.030 |
| Manganese | 0.000 | 2.000 |
| Silicon | 0.000 | 1.000 |
| Phosphorus | 0.000 | 0.030 |
| Sulphur | 0.000 | 0.020 |
| Chromium | 22.000 | 23.000 |
| Molybdenum | 3.000 | 3.500 |
| Nickel | 4.500 | 6.500 |
| Nitrogen | 0.140 | 0.200 |
| Iron | Remainder | |

Mechanical Properties (typical)

| Parameter | Value |
|-------------------------------|-------|
| Yield 0.2 % (ksi/Mpa), Min | 450 |
| Tensile (ksi/Mpa), Min | 655 |
| Elongation (% in 50mm), Min | 25 |
| Reduction in Area, % | 55 |
| Hardness (HB), Max | 293 |

Physical Properties

| Parameter | Value |
|---|-------|
| Density (Kg/m ³) | 7800 |
| Elastic Modulus (Gpa) | 200 |
| Co-eff of Expansion ($\mu\text{m}/\text{m}/^\circ\text{C}$) | 14.7 |
| Thermal Condc. (W/m.K) | 19 |
| Electric Resistivity (n Ω .m) | 850 |

Corrosion Data

Excellent corrosion resistance, better to Grade 316 in most environments. Excellent resistance to localised corrosion including intergranular, pitting and crevice corrosion. The grade is also resistant to chloride stress corrosion cracking at temperatures of up to about 150°C. It mostly perform well in environments which cause premature failure of austenitic grades.

Equivalent Grade Designation

SAF 2205
UNS S31803
BS 318S13
DIN EN 1.4462
Z2.CND22.05.03
SS 2377
X2CrNiMoN 22-5-3

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Available Product Forms

Round, Square, Hexagon & Flat Bars
Seamless / Welded Pipes
Seamless / Welded Tubes
Hot & Cold Rolled Plates & Sheets
Forged Bars
Buttweld Pipe Fittings
Forged Fittings
Ferrule Compression Fittings
Forged Flanges
Valves
Gauges

Common Manufacturing Specifications

ASME SA-182, SA-240, SA-798, SA-790, SA-815
ASTM A182, A240, A276, A479, A789, A790, A815, A928, A988
SAE J405

Alternate to Alloy

904L Better formability is needed, with similar corrosion resistance and lower strength.
2507 Higher resistance to corrosion is required.
6%Mo Higher corrosion resistance required, but with lower strength & better formability.
316L High corrosion resistance & strength not needed. More available & lower cost.

Applications & Industries

Chemical processing, transport and storage
Oil and gas exploration, offshore rigs & Refining
Marine environments
Pulp & paper manufacturing
Pollution control equipment
Chemical process plant

Excellence Inherent

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