

DUPLEX 2304 / UNS S32304/ DIN 1.4362

Combined Corrosion Resistance & High Strength Duplex Steel

2304 Data Sheet

Introduction

2304 is a duplex stainless steel grade with a useful combination of corrosion resistance and high strength. Because it has almost no molybdenum the grade is an economical alternative to 316 in some applications. 2304 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.

Chemical Composition (Typical)

Element	Limits	
	min	max
Carbon	0.000	0.030
Manganese	0.000	2.500
Silicon	0.000	1.000
Phosphorus	0.000	0.040
Sulphur	0.000	0.030
Chromium	21.500	24.500
Molybdenum	0.050	0.600
Nickel	3.000	5.500
Copper	0.050	0.060
Nitrogen	0.050	0.200
Iron	Remainder	

Mechanical Properties (typical)

Parameter	Value
Yield 0.2 % (ksi/Mpa), Min	400
Tensile (ksi/Mpa), Min	600
Elongation (% in 50mm), Min	25
Reduction in Area, %	55
Hardness (HB), Max	290

Physical Properties

Parameter	Value
Density (Kg/m ³)	7800
Elastic Modulus (Gpa)	200
Co-eff of Expansion (µm/m/°C)	14.5
Thermal Condc. (W/m.K)	19
Electric Resistivity (nΩ.m)	850

Corrosion Data

Good general corrosion resistance; approximately the same as Grade 316 in most environments. Good resistance to localised corrosion including intergranular, pitting and crevice corrosion. It has similar resistance to sea water as grade 316. It is also resistant to chloride stress corrosion cracking at temperatures of up to over 100°C. It will often perform well in environments which cause premature failure of austenitic grades.

Equivalent Grade Designation

SAF 2304
UNS S32304
DIN EN 1.4362
X2CrNiN23-4
SS 2327
Z3 CN 23.04 Az

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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

ASTM A240, ASTM A276, ASTM A480, ASTM A789, ASTM A790

Alternate to Alloy

316L Same pitting & crevice corrosion resistance, easily cold formed & readily available.

2205 High corrosion resistance & strength not needed. More available & lower cost.

6%Mo Higher corrosion resistance required, but with lower strength & better formability.

Durinox F18MS Same pitting & crevice corrosion resistance, easily cold formed & readily available.

Durinox F18MS is only available in thin gauge sheet and coil.

Applications & Industries

Oil and Gas industry equipment
Chemical process industries
Process and service water systems
Pulp & Paper Industries
Liquor Tanks
Paper Machines
Marine Environment

Excellence Inherent

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