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PRODUCT SPECIFICATIONS · PIPE

Duplex Steel 2205 Pipe

Chemical composition, mechanical properties and material characteristics

Features

- 2205 Duplex stainless steel alloy is a duplex stainless steel composed of 22% chromium,3% molybdenum and 4.5% nickel nitrogen alloy.
- It is featured by high strength, good impact toughness and good overall and local resistance to stress corrosion.

Typical Applications

- Standard duplex grade for offshore, desalination, chemical pressure vessels and chloride-bearing process piping where higher strength and better SCC resistance than 300-series austenitics are required.

Product Parameters

Product Name	2205 Duplex Stainless Steel Pipe
Type	Duplex Stainless Steel (UNS S31803 / S32205)
Standard	UNS S31803 / S32205; EN 1.4462; ASTM A240, A789/A790, A276/A479, A182.
Surface	No.1 / 1D, 2D, 2B, pickled, sandblasted or shot-blasted; ground finish on request.
Delivery Condition	Solution annealed and pickled (or equivalent condition per order).
Scope of Application	Standard duplex grade for offshore, desalination, chemical pressure vessels and chloride-bearing process piping where higher strength and better SCC resistance than 300-series austenitics are required.
Certificate	EN 10204 3.1 mill test certificate as standard; 3.2, PMI, ferrite, ASTM A923 / G48 and impact tests available on request. NACE MR0175 / ISO 15156 compliance available when specified.
Production Technology	Hot- or cold-worked, then solution annealed to restore the balanced ferrite–austenite microstructure and corrosion resistance. Cutting, leveling, slitting and end finishing available. Seamless or welded supply routes depending on size; cut-to-length and end preparation available.
Edge Processing	Plain, beveled or threaded ends available on request; end finishing and length tolerance per order.
Round Tube OD	4–200 mm
Square Tube	10 × 10–100 × 100 mm
Rectangular Tube	10 × 20–50 × 100 mm
Wall Thickness	0.6–6.0 mm
Length	1–6 m; custom lengths.

Chemical Composition

C	Si	Mn	Cr	Ni	Mo	S	P
≤ 0.03	≤1.0	≤ 2.0	21.0～23.0	4.5～6.5	2.5～3.5	≤ 0.02	≤ 0.03

Mechanical Properties

Tensile Strength Kb (MPa)	Yield Strength σ0.2 (MPa)	Elongation D5 (%)	Hardness
≥620	≥450	≥25	≤293HB

Physical Performance

Density(g/cm³)	Modulus of Elasticity(Gpa)	Coefficient of Thermal Expansion(10 -6 /°C)	Coefficient of Thermal Conductivity(W/m * K)	Resistivity(MΩ. cm)
7.88	190	13.7	19.0	80

Selection note: verify PREN, toughness and welding procedure against the chloride service and design code.

Related Properties

Corrosion Resistance	Standard duplex grade with strong chloride / SCC resistance relative to 300-series austenitics in many oil & gas, desalination and process media. Verify PREN and project specs for the specific fluid and temperature.
Strength Advantage	Roughly twice the yield strength of common austenitic stainless in many product forms, enabling lighter designs when codes allow. Mechanical properties vary with heat treatment and product form.
Weldability	Can be welded with GTAW, GMAW and SMAW when heat input, interpass temperature and duplex-matched filler are controlled to keep a balanced ferrite–austenite weld microstructure. Poor practice may reduce toughness or corrosion resistance in the HAZ.
Forming & Fabrication	Cold forming is feasible but needs higher force and springback allowance than 304/316 because of the higher strength. Hot forming and subsequent solution annealing should follow the grade procedure to restore corrosion performance.
Service Window	Best suited to chloride-bearing aqueous service inside a limited temperature window. Prolonged holding in the 300–550 °C embrittlement range should be avoided unless the grade data explicitly allow it.

Material guidance for your next project

Send your grade, size and application requirements to our team.

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