22 CHROME (UNS S31803)

22 Chrome (UNS S31803), also referred to as 2205 Duplex or Duplex 22 Chrome, is a cold-hardened duplex stainless steel intended for corrosion resistance in sweet (CO_2) and mildly sour (H_2S) environments with moderate chloride content, requiring high strength up to 400°F. 22 Chrome offers improved mechanical properties and increased resistance to the effects of CO_2, chlorides, pH, and temperatures when compared with Super 13 Chrome. The higher strength and temperature resistance, relative to Super 13 Chrome, allow it to be used in deeper wells with high-pressure and high-temperature (HPHT) conditions, as downhole tubular components, packers, and other subsurface equipment.

All environmental factors, including H_2S, CO_2, temperature, pH, and chloride concentration, should be considered before final material selection.

This alloy is classified in MR0175/ISO15156 as a duplex stainless steel having a Pitting Resistance Equivalent Number (PREN) $\leq$40 and is suitable for H_2S partial pressure $\leq$0.3 psi.

NOMINAL COMPOSITION

Chromium 22% Nickel 5.0% Molybdenum 3.0% Nitrogen 0.18% Iron Balance

SPECIFIED MECHANICAL PROPERTIES - API 5CRA / ISO 13680 Group 2 Category 22-5-3

Grade	Yield Strength min. (ksi)	Tensile Strength min. (ksi)	Elongation min. (%)	Hardness max. (HRC)	NACE MR0175/ISO 15156 Environmental Limits
110	110	125	11	36	Table A.25
125	125	130	10	36	Table A.25
140	140	145	9	38	Not recommended for sour service.

TYPICAL PHYSICAL PROPERTIES

		70°F	200°F	400°F
Density	lbs/in^3	0.28	-	-
Thermal Expansion	$X10^{-6}/°F$	7.0	7.5	8.0
Elastic Modulus	psi x 10^6	29.0	28.2	27.0
Poisson Ratio		0.24	0.24	0.24
Thermal Conductivity	Btu/ft h °F	8	9	10
Specific Heat	Btu/lb °F	0.12	0.12	0.12

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