13 Chrome L-80

13 Chrome L80, UNS S42000, is a quenched and tempered martensitic stainless steel used for corrosion resistance in sweet (CO_2) and mildly sour (H_2S) environments up to 300°F. Commonly used as downhole tubulars, components, packers, and other subsurface equipment, it is included in API 5CT as Group 2, Grade L80, Type 13Cr. Its controlled yield strength and hardness comply with NACE MR0175.

This grade is best suited for mildly corrosive conditions as pH, chlorides, temperature, and H_2S may limit its use. NACE MR0175/ISO15156 Table A.19 provides a recommended limit of 1.5 psi partial pressure H_2S with pH ≥3.5.

NOMINAL COMPOSITION

Chromium 13% Carbon 0.19% Manganese 0.75% Nickel 0.050% max Iron Balance

SPECIFIED MECHANICAL PROPERTIES - API 5CT Group 2 Grade L80 Type 13Cr

Yield Strength min. (ksi)	Yield Strength max. (ksi)	Tensile Strength min. (ksi)	Hardness max (HRC)	NACE MR0175/ISO 15156 Reference
80	95	95	23	Table A.19

TYPICAL PHYSICAL PROPERTIES

		70°F	250°F
Density	lbs/in^3	0.28	0.28
Thermal Expansion	X10^{-6}/ °F	--	5.9
Elastic Modulus	psi x 10^6	29.6	29.3
Poisson Ratio		0.3	0.3
Yield Strength De-Rating	%	100	91