Stainless Steel 316 / 316L Seamless Pipes & Tubes

UNS S31600 / S31603 | W.Nr 1.4401 / 1.4404 | Austenitic Stainless Steel

SS 316 / 316L (UNS S31600 / S31603) are molybdenum-bearing austenitic stainless steels with 2-3% Mo, providing significantly improved resistance to pitting and crevice corrosion in chloride environments. 316L is the low-carbon variant (C: 0.030% max) preferred for welded fabrication, eliminating the risk of intergranular corrosion.

QUICK REFERENCE

Parameter	Value
Grade	SS 316 / 316L
UNS Designation	S31600 / S31603
Werkstoff Number	1.4401 / 1.4404
EN Designation	X5CrNiMo17-12-2 / X2CrNiMo17-12-2
Size Range	1/4" NPS to 10" NPS (6.35mm to 273.1mm OD)
Wall Thickness	SCH 5S to SCH 160, XXS
Standards	ASTM A312 / ASME SA312, ASTM A213 / ASME SA213, ASTM A269, DIN EN 10216-5

CHEMICAL COMPOSITION (% by weight)

Grade	C	Mn	Si	Cr	Ni	Mo	P	S
SS 316	0.08 max	2.00 max	0.75 max	16.0-18.0	10.0-14.0	2.0-3.0	0.045 max	0.030 max
SS 316L	0.030 max	2.00 max	0.75 max	16.0-18.0	10.0-14.0	2.0-3.0	0.045 max	0.030 max

MECHANICAL PROPERTIES (Min. at Room Temperature)

Grade	Tensile Strength	Yield Strength	Elongation	Hardness
SS 316	515 MPa min	205 MPa min	35% min	95 HRB max
SS 316L	485 MPa min	170 MPa min	35% min	95 HRB max

PHYSICAL PROPERTIES

Property	Value
Density	7.98 g/cm3
Melting Range	1375-1400 C
Thermal Conductivity	16.3 W/m-K
Electrical Resistivity	740 nOhm-m
Specific Heat	500 J/kg-K
Coeff. of Thermal Expansion	15.9 um/m-C

CORROSION RESISTANCE

Property	Rating / Value
Pitting Resistance (PREN)	~24
Max Service Temp (Oxidizing)	870 C
Intergranular Corrosion	316: Susceptible if sensitized / 316L: Resistant (low carbon)
Stress Corrosion Cracking	Better than 304 in chlorides
General Corrosion Rate	<0.05 mm/yr in most acids
Seawater Resistance	Moderate - better than 304

EQUIVALENT INTERNATIONAL GRADES

ASTM	JIS	BS	GOST
TP316 / TP316L	SUS 316 / SUS 316L	316S31 / 316S11	08Kh17N13M2 / 03Kh17N14M2

TYPICAL APPLICATIONS

Marine environments and coastal installations | Chemical processing with chloride exposure | Pharmaceutical manufacturing equipment | Offshore oil & gas piping systems | Pulp and paper industry | Nuclear fuel reprocessing (316L) | Medical implants and surgical instruments

KEY ADVANTAGES

- ✓ Superior pitting and crevice corrosion resistance vs 304
- ✓ Excellent resistance to chloride environments
- ✓ 316L: Best combination of weldability and chloride corrosion resistance
- ✓ 316L: No post-weld heat treatment required
- ✓ Industry standard for pharmaceutical & biotech
- ✓ Good resistance to sulfuric acid solutions

APPLICABLE STANDARDS

ASTM A312 / ASME SA312 | ASTM A213 / ASME SA213 | ASTM A269 | DIN EN 10216-5