

AL-6XN alloy is a super austenitic stainless steel with outstanding resistance to chloride pitting and crevice corrosion. AL-6XN alloy offers a means to upgrade corrosion resistance significantly from 316L stainless, but without the expense of using alloy C-276 and other high nickel alloys.

Because of its nitrogen content, AL-6XN alloy has greater tensile strength than common austenitic stainless, while retaining high ductility and impact strength. The ASME allowable stresses for AL-6XN alloy are up to 40% higher than for 316L stainless, and more than twice those for alloy 400 (Ni-Cu).

Specifications

UNS: N08367 ASTM: B 688, A 240, B 675, A 312, B 676, A 249, B 804, B 691, A 479, B 462, A 182, B 564, B 366, B 472
ASME: SB-688, SA-240, SB-675, SA-312, SB-276, SA-249, SB-691, SA-479, SB-462, SA-182, SB-564, SB-366 Case Code N-438-3, B31.1 Case 155-1

Chemical Composition, %

	Ni	Cr	Mo	Mn	Cu	Si	C	N	S	P	Fe
MIN	23.5	20.0	6.0	-	-	-	-	0.18	-	-	-
MAX	25.5	22.0	7.0	2.0	0.75	1.0	0.03	0.25	0.03	0.04	bal

Physical Properties

Density: 0.291 lb/in³ Melting Range: 2410 - 2540°F Electrical Resistivity at 68°F: 535 Ohm-circ mil/ft

Temperature, °F	70	200	300	400	600	700	800
Coefficient* of Thermal Expansion, in/in°F x 10 ⁻⁶	-	7.9	8.3	8.4	8.6	8.7	8.8
Thermal Conductivity Btu • ft/ft ² • hr • °F	6.7	7.5	8.1	8.7	10.0	10.6	11.2
Modulus of Elasticity Dynamic, psi x 10 ⁶	28.3	27.4	-	26.1	24.8	-	23.4

*70°F to indicated temperature

Mechanical Properties

Minimum Specified Properties, ASME SB-688 Plate

Ultimate Tensile Strength, ksi	95
0.2% Yield Strength, ksi	45
Elongation, %	30
Hardness MAX, HRC	30.5

Features

- Excellent resistance to pitting and crevice corrosion in chloride solutions
- Practical immunity to stress corrosion cracking in NaCl environment
- High strength and toughness

Applications

- Flue gas desulfurization (FGD) equipment
- Reverse osmosis desalination equipment and pumps
- Chemical process tanks and pipelines
- Seawater heat exchangers
- Tall oil distillation columns and packing
- Offshore oil and gas production equipment
- Pulp bleaching plant washer, vats, press rolls, and pipelines
- Salt dryers

Mechanical Properties Cont.
Typical Tensile Properties, Plate

Temperature, °F	-450	-320	70	200	400	600	800	1000
Ultimate Tensile Strength, ksi	218.0	196.0	108.0	99.9	90.3	86.0	87.0	83.6
0.2% Yield Strength, ksi	142.0	107.0	53.0	49.4	40.4	36.3	36.0	34.0
Elongation, %	36	49	47	47	46	47	48	50
Charpy Impact V-notch, ft-lbs	322*	85	140	-	-	-	-	-

* K_{Ic} Fracture Toughness

ASME Maximum Allowable Stresses, Section VIII, Division 1, ksi

Temperature, °F	200	400	600	800
AL-6XN®	27.1	24.6	23.3	22.6
316L	20.0	19.3	17.0	15.9
Alloy 400	18.7	18.7	18.7	15.0

Corrosion Resistance

	PRE _N	CPT, °F	CCCT, °F
AL-6XN®	44	172	110
ZERON® 100	41	180	108
316L	24	68	<28

$PRE_N = \%Cr + 3.3\%Mo + 16\%N$

Critical Crevice Corrosion Temperature (CCCT) - ATSM G48B

TECHNICAL QUESTIONS?

OUR TEAM OF METALLURGISTS ARE HERE TO HELP.

PHONE: 1.800.521.0332 (Ask for a Metallurgist)

EMAIL: metallurgicalhelp@rolledalloys.com

Additional resources available at rolledalloys.com/technical-resources/



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