

Alloy 400 is a ductile nickel-copper alloy with resistance to a wide range of corrosive environments. This grade is often chosen to handle sulfuric acid through 80% concentration at room temperature, and about 15% H₂SO₄ boiling. Alloy 400 possesses useful resistance to aerated hydrochloric acid up to 10% concentration at room temperature. The alloy has excellent resistance to sea or brackish water under high-velocity conditions. Alloy 400 is one of the few materials with good resistance to hydrofluoric acid.

Specifications

UNS: N04400 **W. Nr./EN:** 2.4360, 2.4361 **ASTM:** B 127, B 164, B 725, B 165, B 366
ASME: SB-127, SB-164, SB-725, SB-165, SB-366 **NACE:** MR0175 **ISO:** 15156-3

Chemical Composition, %

	Ni	Mn	Cu	Si	C	S	Fe
MIN	63.0	—	28.0	—	—	—	—
MAX	70.0	2.0	34.0	0.5	0.3	0.024	2.5

Features

- Resistant to a variety of corrosive environments
- Freedom from chloride stress corrosion cracking
- Good strength and toughness over a wide temperature range
- Useful resistance to dry chlorine, fluorine hydrogen chloride and hydrogen fluoride gases

Applications

- Crude oil distillation towers
- Marine components
- Valve and pump components
- Chemical processing equipment
- Caustic evaporators
- Oil and gas applications
- Hydrofluoric acid production
- Salt production equipment

Physical Properties

Density: 0.319 lb/in³ **Melting Range:** 2370-2460°F

Temperature, °F	70	200	400	600	800	1000	1200
Coefficient of Thermal Expansion* in/in°F x 10 ⁻⁶	—	7.7	8.6	8.8	8.9	9.1	9.3
Thermal Conductivity Btu • ft/ft ² • hr • °F	12.6	13.9	16.1	17.9	19.8	22.0	23.9
Modulus of Elasticity Dynamic, psi x 10 ⁶	26.0	26.0	25.6	24.7	21.0	16.0	13.0

* 70°F to indicated temperature.

Mechanical Properties

Minimum Specified Properties, ASME B 168

Ultimate Tensile Strength, ksi	70
0.2 % Yield Strength, ksi	28
Elongation, %	35
Hardness MAX, Brinell	110

Temperature, °F	212	392	572	725	932	1112
Ultimate Tensile Strength, ksi	68.2	65.3	64.5	60.2	48.6	37.6
0.2 % Yield Strength, ksi	26.1	24.7	24.1	22.0	16.4	15.8

* 70°F to indicated temperature.

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