

317/317L is a molybdenum containing austenitic stainless steel, with improved corrosion resistance over 304/304L and 316/316L stainless steel. The increased levels of chromium, nickel, and molybdenum over 316L stainless steel improve chloride pitting resistance and general corrosion. Through the controlled addition of nitrogen it is common for 317L to meet the mechanical properties of 317, while maintaining a low carbon content.

Chemistry

| | Ni | Cr | Mo | Mn | Si | C | N | S | P | Fe |
|-----|------|------|-----|-----|------|------|-----|------|-------|-----|
| Min | 11.0 | 18.0 | 3.0 | - | - | - | - | - | - | - |
| Max | 15.0 | 20.0 | 4.0 | 2.0 | 0.75 | 0.03 | 0.1 | 0.03 | 0.045 | bal |

Per ASTM A240

Specifications

UNS: S31700, S31703

W. Nr.: 1.4438

ASTM: A240

ASME: SA240

Physical Properties

| | |
|---|--------------------------|
| Density | 0.29 lb/in ³ |
| Melting Range | 2540 - 2630°F |
| Poisson Ratio | 0.28 |
| Electrical Resistivity | 29.9 μΩ • in |
| Coefficient of Thermal Expansion (68°F - 212°F) | 9.2 μin/in • °F |
| Thermal Conductivity (212°F) | 8.4 BTU/(hr•ft•°F) |
| Modulus of Elasticity (68°F) | 29 • 10 ⁶ psi |

Mechanical Properties

Specification: A240

| | |
|--------------------------------|-----|
| Ultimate Tensile Strength, ksi | 75 |
| 0.2% Yield Strength, ksi | 30 |
| Elongation, % | 40 |
| Hardness MAX, Brinell | 217 |

*All values are minimums unless stated otherwise.

Corrosion Resistance

Typical Pitting Resistance Equivalent Number (PREn)

| Alloy | Nominal Composition | | | | PREn* |
|------------|---------------------|-----|-----|------|-------|
| | Cr | Mo | W | N | |
| 304/304L | 18.2 | 1.4 | - | 1.06 | 20.5 |
| 316/316L | 16.7 | 2.0 | - | 1.04 | 23.9 |
| LDX 2101® | 21.5 | 0.3 | - | 0.2 | 26.0 |
| 317/317L | 18.0 | 3.1 | - | 0.1 | 29.5 |
| 2205 | 22.1 | 3.1 | - | 0.2 | 34.9 |
| 2507 | 25.3 | 3.7 | - | 0.3 | 42.3 |
| Zeron® 100 | 25.5 | 3.7 | 0.7 | 0.2 | 42.1 |
| AL-6XN® | 20.5 | 6.1 | - | 0.2 | 44.2 |
| 625 | 22.3 | 8.5 | - | - | 50.4 |

*PREn = Cr% + 3.3 x (Mo% + 0.5 x W%) + 16 x N%

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Features

- Improved general and localized corrosion compared to 304/304L and 316/316L stainless
- Good formability
- Good weldability

Applications

- FGD systems
- Chemical process vessels
- Petrochemical
- Pulp and paper
- Condensers in power generation

