



Nitronic® 32 Austenitic Stainless Steel Alloy (UNS S24100, XM 28)

Electralloy's Nitronic® 32 is a low nickel austenitic stainless steel that provides approximately twice the yield strength of Type 304 stainless steel as well as comparable corrosion resistance.

CHEMICAL COMPOSITION (Nominal Analysis, weight percent)

| | | | |
|---|--------------------|-----------------------|--------------------|
| Carbon (<i>max.</i>)..... | 0.15 | Chromium | 16.50/19.00 |
| Manganese | 11.00/14.00 | Nickel | 0.50/2.50 |
| Phosphorous (<i>max.</i>)..... | 0.045 | Nitrogen | 0.20/0.45 |
| Sulfur (<i>max.</i>)..... | 0.030 | Iron | Balance |
| Silicon (<i>max.</i>)..... | 1.00 | | |

TYPICAL APPLICATIONS

Nitronic® 32 is ideal material for simple cold-headed parts requiring high mechanical properties with comparable corrosion resistance to 304. Examples are clamps for pole line hardware and concrete reinforcing accessories. Other applications include shafting, dam gate stems, skid wire for underground transmission lines, abrasion and corrosion-resistant screens, high strength non-magnetic springs, wire forms, racks and cages.

Electralloy's **Nitronic® 32** Stainless Steel is supplied in ingot, forging billet, bar and plate to meet the requirements of the following specifications, and more...

ASTM A313, ASTM A314, ASTM A276, ASTM A580

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Nitronic® 32 Stainless Steel (UNS S24100, XM 28)

PHYSICAL PROPERTIES

Melting Temperature:

2585°F - 2635°F (1418°C - 1446°C)

Density:

0.281 lb./in.³ (7.781 gm/cm³)

Specific Heat:

(32°F - 212°F) 0.12 Btu/lb./°F

Magnetic Permeability:

(H=200 Oersteds) Annealed 1.008 @ 70°F

Cold Drawn 70% 1.011 @ 70°F

Electrical Resistivity:

(@ 70°F) 27.6 microhm-in.

Modulus of Elasticity:

(@ 70°F) 29 x 10⁶ psi

Coefficient of Thermal Expansion:

| Temperature °F | Temperature °C | in/in./°F |
|----------------|----------------|-------------------------|
| 73 to 400 | 23 to 204 | 9.4 x 10 ⁻⁶ |
| 73 to 1200 | 23 to 649 | 10.7 x 10 ⁻⁶ |
| 73 to 1800 | 23 to 982 | 11.6 x 10 ⁻⁶ |

MECHANICAL PROPERTIES

Tensile Properties (Annealed):

| | UTS (ksi) (min.) | .2% YS (ksi) (min.) | %EL (min.) | %RA (min.) |
|-----------|---------------------|------------------------|---------------|---------------|
| ASTM A276 | 100 | 55 | 30 | 50 |

HEAT TREATMENT

Nitronic® 32 does not harden by heat treatment. Anneal by heating to 1950°F followed by rapid cooling.

WORKABILITY

Nitronic® 32 may be formed by the same methods used with other stainless steels. The recommended hot working temperature range is between 2050°F - 2200°F. In-process annealing should be accomplished between 1900°F - 2000°F.

WELDING

Nitronic® 32 can be welded using conventional methods such as gas tungsten arc (GTAW), gas metal arc (GMAW), and shielded metal arc (SMAW).

MACHINING

Nitronic® 32 has machining characteristics similar to Type 304. The high strength and high work hardening necessitates machining the alloy at lower cutting rates than used for Type 304. Nitronic® 32 has a machinability rating of about 30% of AISI B1112 steel.

CORROSION RESISTANCE

The corrosion resistance of Nitronic® 32 in weak acid solutions and pitting media approaches that of Type 304. In more aggressive media Nitronic® 32 is somewhat less corrosion resistant than Type 304. Due to its higher carbon content the alloy is not as resistant to intergranular attack as Type 304 and will not pass ASTM A262 tests when sensitized at 1250°F.