

# Inconel® 625 Nickel Alloy - AMS 5666 - UNS N06625

Nickel Alloy 625, frequently called Inconel® 625, is a corrosion and heat-resistant Nickel-based alloy.

It is alloyed with Chromium and Iron, along with Niobium-Tantalum and Molybdenum for increased toughness and strength. It is nonmagnetic, and corrosion and oxidation-resistant, with service temperatures ranging from cryogenic to 1800°F. Because of its alloy matrix, precipitation hardening treatments are not required. This alloy is generally double-melted, with either EF-AOD melt (Electric Furnace followed by Argon Oxygen Decarburization) or VIM (Vacuum Induction Melt); and with a second melt by either VAR (Vacuum Arc Remelt), or ESR (Electroslag Reduction).

This alloy exhibits excellent corrosion resistance to salt and fresh water, alkaline environments, and air. It is resistant to both oxidizing and non-oxidizing environments, and chloride stress corrosion cracking. Chloride stress corrosion cracking resistance is excellent. The alloy resists scaling and oxidation at high temperatures.

| Chemical Composition: |                     |           |        |
|-----------------------|---------------------|-----------|--------|
| Symbol                | Element             | Min %     | Max %  |
| C                     | Carbon              | -         | 0.10%  |
| Mn                    | Manganese           | -         | 0.50%  |
| Si                    | Silicon             | -         | 0.50%  |
| P                     | Phosphorus          | -         | 0.015% |
| S                     | Sulfur              | -         | 0.015% |
| Cr                    | Chromium            | 20.00%    | 23.00% |
| Mo                    | Molybdenum          | 8.00%     | 10.00% |
| Cb (Nb)               | Columbium (Niobium) | 3.15%     | 4.15%  |
| Co                    | Cobalt              | -         | 1.00%  |
| Ti                    | Titanium            | -         | 0.40%  |
| Al                    | Aluminum            | -         | 0.40%  |
| Fe                    | Iron                | -         | 5.00%  |
| Ni                    | Nickel              | remainder | -      |

## Annealed Longitudinal Tensile Properties per AMS 5666

| Property                   | Up to 4", incl. | Over 4" to 10", incl. |
|----------------------------|-----------------|-----------------------|
| Tensile Strength           | 120 ksi         | 110 ksi               |
| Yield Strength 0.2% offset | 60 ksi          | 50 ksi                |
| Elongation in 4D           | 30%             | 25%                   |
| Hardness                   | 287 Bhn max     | 287 Bhn max           |

## Inconel®625 Nickel Applications:

Nickel Alloy 625 aerospace applications include jet engine exhaust systems, propeller blades, heat exchangers, and aircraft applications. It's also used for heat shields, furnace hardware, chemical plant equipment, and seawater applications.

## Common Trade Names:

Nickel 625  
 625 Alloy  
 CarTech Pyromet® Alloy 625  
 W-No 2.4856  
 ISO NW6625  
 Inconel 625  
 Haynes 625  
 Nickelvac 625  
 Nicrofer 6020  
 Altemp 625  
 Chronic 625

## Common Specifications:

AMS 5666 Bars, Forgings, Extrusions  
 AMS 5599 Sheet, Strip, Plate  
 AMS 5837 Welding Wire  
 AMS 5869 Sheet, Strip, Plate  
 ASTM B446  
 ASME SB446  
 ASTM B564  
 MS 5837  
 ASME SB443 Gr 1, SB446 Gr 1  
 ASTM B443 Gr 1, B446 Gr 1  
 EN 2.4856  
 ISO 15156-3  
 NACE MR0175-3  
 UNS N06625  
 Werkstoff 2.4856  
 DIN 17752  
 Rod, Bar, Wire and Forging Stock