HONGCHEN METAL
INDUSTRIAL METAL MATERIALS

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PRODUCT SPECIFICATIONS · PLATE

# Inconel 601 Plate

Chemical composition, mechanical properties and material characteristics

### Features

- Inconel 601 plate is made of a high-strength, corrosion-resistant nickel-based alloy that is widely used in various high-temperature equipment.
- As a material with good mechanical properties and corrosion resistance, Inconel 601 is widely used in aviation, chemical industry, marine engineering and other fields.

### Typical Applications

- Preferred for thermal-processing, radiant tubes and other cyclic high-temperature duties where aluminum helps form a protective oxide scale.

## Product Parameters

| | |
|---|---|
| Product Name | Inconel 601 Plate |
| Type | Ni-Cr-Al Alloy (Inconel 601) |
| Standard | UNS N06601; ASTM B168 / B167 / B166 |
| Surface | Pickled, bright annealed, peeled / turned or polished; clean, low-contamination finish preferred for hot service. |
| Delivery Condition | Solution annealed and / or age-hardened to the ordered condition (e.g. AMS / ASTM temper). |
| Scope of Application | Preferred for thermal-processing, radiant tubes and other cyclic high-temperature duties where aluminum helps form a protective oxide scale. |
| Certificate | EN 10204 3.1 MTC with chemistry and mechanical results; aerospace / oil-tool certifications and third-party inspection available when specified. |
| Production Technology | Produced by melting practices suited to nickel alloys, then hot worked / cold worked and heat treated to the specified condition. Machining and welding require nickel-alloy procedures. Cut-to-length, leveling, plasma / waterjet cutting and surface grinding available. |
| Edge Processing | Mill, slit or trimmed edge; final edge condition confirmed by thickness, width tolerance and downstream welding / forming needs. |
| Thickness | 0.3mm-200mm |
| Length | 2000mm, 2438mm, 3000mm, 5800mm, 6000mm, 12000mm, etc. |
| Width | 40mm-600mm, 1000mm, 1219mm, 1500mm, 1800mm, 2000mm, 2500mm, 3000mm, 3500mm, etc. |

## Chemical Composition

| C | Al | Si | S | Cr | Mn | Fe | Ni | Cu |
|---|---|---|---|---|---|---|---|---|
| 0.1 max | 1.0-1.7 | 0.5 max | 0.015 max | 21.0-25.0 | 1.0 max | Remainder | 58.0-63.0 | 1.0 max |

## Mechanical Properties

| Tensile Strength (ksi) | 0.2% Yield Strength (ksi) | Elongation% in 2 inches |
|---|---|---|
| 80 | 30 | 30 |

## Physical Performance

| | Units | Temperature in°C |
|---|---|---|
| Density | 8.11 g/cm³ | Room |
| Specific Heat | 0.107 Kcal/kg.C | 20° |
| Melting Range | 1360-1411°C | - |
| Modulus of Elasticity | 206.5 KN/mm² | 20° |
| Electrical Resistivity | 118 μΩ.cm | 20° |
| Coefficient of Expansion | 13.75 μm/m °C | 20 - 100° |
| Thermal Conductivity | 11.2 w/m-° K | 20° |

*Selection note: confirm allowable stress at the design temperature / hold time; atmosphere chemistry affects oxidation life.*

## Related Properties

| | |
|---|---|
| **High-Temperature Strength** | Retains useful tensile and yield strength at temperatures where ordinary stainless softens rapidly. Allowable stress still depends on grade, product form, hold time and whether the duty is continuous or cyclic—always check the design curve for the intended temperature. |
| **Oxidation Resistance** | Forms a protective scale in hot air and many furnace atmospheres within the recommended range. Aggressive sulfidizing, carburizing or salt-laden gases can attack the scale; atmosphere chemistry and peak temperature should be reviewed together. |
| **Creep & Rupture** | Selected nickel and iron-nickel grades provide useful creep and stress-rupture resistance for sustained hot service such as heaters, reformers and turbine-related hardware. Long-term life estimates require grade-specific rupture data at the design stress. |
| **Fabricability** | Can be formed, machined and welded with practices suited to nickel alloys. Expect rapid work hardening, higher cutting forces and the need for clean, low-contamination fabrication to protect later high-temperature performance. |
| **Thermal Cycling** | Repeated heat-up / cool-down can cause scale spalling or thermal-fatigue cracking at edges and welds. Design for expansion, avoid sharp thickness transitions, and follow any required solution or aging treatment after heavy fabrication. |

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