HONGCHEN METAL
INDUSTRIAL METAL MATERIALS

PRODUCT DATA SHEET
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PRODUCT SPECIFICATIONS · PLATE

# Incoloy 901 Plate

Chemical composition, mechanical properties and material characteristics

### Features

- Incoloy 901 is an age-hardening nickel-iron-chromium alloy developed for high-temperature strength and resistance to oxidation and sulfidation.
- It is supplied in plate, sheet, strip, bar, and tube forms for demanding aerospace and energy applications.

### Typical Applications

- Applied in gas turbines, aerospace hot-section hardware, petrochemical heaters, reformer components and other elevated-temperature structures that must retain strength and resist oxidation or hot corrosion. Design stress should be checked against grade data at the intended temperature and hold time.

## Product Parameters

| | |
|---|---|
| Product Name | 901 Plate |
| Type | Ni-Fe-Cr Age-hardening Alloy (Incoloy 901) |
| Standard | UNS N09901 |
| 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 | Applied in gas turbines, aerospace hot-section hardware, petrochemical heaters, reformer components and other elevated-temperature structures that must retain strength and resist oxidation or hot corrosion. Design stress should be checked against grade data at the intended temperature and hold time. |
| 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 | 0.5-100 mm |
| Width | 1000-2500 mm |
| Length | 2000-12000 mm |

## Chemical Composition

| Ni | Fe | Cr | Mo | Ti | Al | C |
|---|---|---|---|---|---|---|
| 40-45 | Bal | 11-14 | 5.0-6.5 | 2.8-3.1 | ≤0.35 | ≤0.10 |

## Mechanical Properties

| Tensile (MPa) | Yield (MPa) | Elongation (%) |
|---|---|---|
| ≥1035 | ≥725 | ≥12 |

## Physical Performance

| Density | Service Temp | Modulus |
|---|---|---|
| 8.21 g/cm³ | up to ~650°C | ~200 GPa |

*Reference: UNS N09901 Incoloy 901 datasheet*

## 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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