

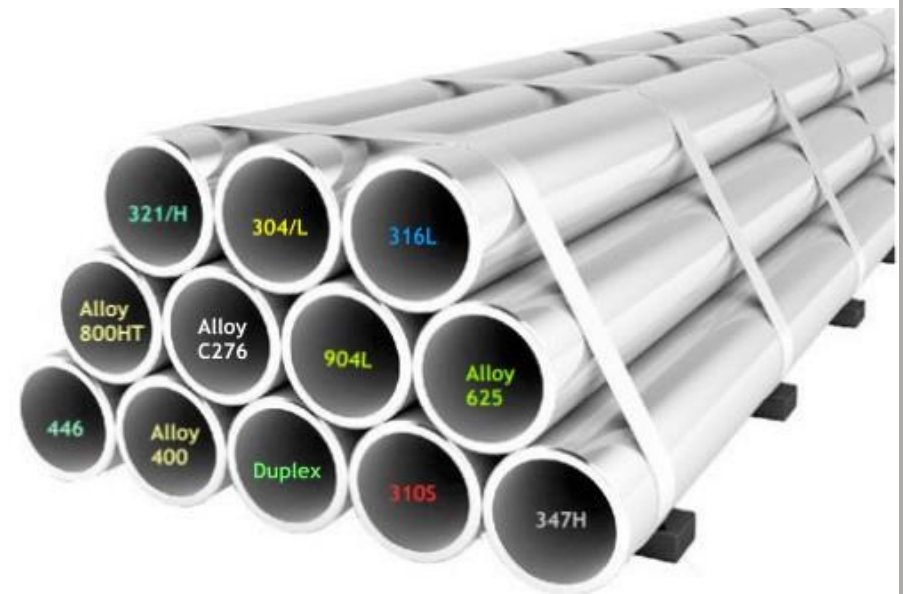
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# INCONEL 601

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## Datasheet for Inconel 601

- Pipes & Tubes
- Sheets & Plates
- Bars & Rods, Forgings
- Fittings & Flanges
- Nuts & Bolts
- Valves



# UNS N06601, W.Nr. 2.4851

## What is Inconel 601?

- Inconel 601 (UNS N06601 or DIN W.Nr. 2.4851), also known as Alloy 601, is an alloy similar to Alloy 600 but with addition of aluminium for outstanding resistance to oxidation, and other forms of high-temperature corrosion as well as improved nitriding resistance. It also has high mechanical properties at elevated temperatures.
- **Inconel 601** is similar to 600 in that its composition is nickel-chromium-iron, but the addition of aluminum differentiates it. Adding in the aluminum creates a higher resistance to oxidation than Inconel 600, and is often used in general-purpose engineering for high temperature conditions that require extraordinary resistance. This nickel alloy stands out due to its resistance to high temperature oxidation, remaining highly resistant to oxidation through 2200° F. It is commonly used in thermal capacities, industrial heat conditions and other operations requiring heat; the metal does not respond to heat conditions or treatments. Inconel 601 is also found in water environments; the metal shows high resistance to corrosion from water. Like Inconel 600, Inconel 601 only responds to cold-working practices and its mechanical properties are applicable for many areas of use. Therefore, it is classified as a super alloy/high performance alloy. However, alloy 601 is not suggested for use in strongly reducing, sulfur bearing environments.

## Inconel 601 Product Specification

|                |                                                                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product        | Inconel 601                                                                                                                                                                                 |
| Equivalents    | Alloy 601, UNS N06601, 2.4851                                                                                                                                                               |
| Items          | Pipe, Tubes, Tubing, Fittings, Flanges, Valves, Fasteners, Sheet, Square Bar, Threaded Bar, Plate, Hexagon Bar, Fasteners and Fixings, Round Bar, Flat Bar, Rebar, Angle, Tube & Pipe, Wire |
| Size           | 1/4" - 60"                                                                                                                                                                                  |
| Pipe Type      | Seamless, Welded, ERW, Fabricated, Custom Size Pipes                                                                                                                                        |
| Specifications | ASTM, ASME, DIN, GOST, JIS                                                                                                                                                                  |
| Certification  | EN 10204 3.1                                                                                                                                                                                |
| Fittings Type  | Butt Weld, Screwed & Socket Weld, Flanges, Instrumentation                                                                                                                                  |
| Other Fittings | Elbows, Tees, Reducers, Caps, Stub Ends, Flanges (ANSI, Table E, D and H), Nuts, Bolts, Screws, Threaded Bars                                                                               |

### Inconel 601 (UNS N06601, 2.4851) Product Forms & Standards

| Product Forms                            | Standards            |
|------------------------------------------|----------------------|
| Inconel Alloy 601 Rod, Bar & Wire        | ASTM B166            |
| Inconel Alloy 601 Plate, Sheet & Strip   | ASTM B168, ASTM B906 |
| Inconel Alloy 601 Seamless Pipe and Tube | ASTM B167, ASTM B829 |
| Inconel Alloy 601 Welded Pipe            | ASTM B775            |
| Inconel Alloy 601 Welded Tube            | ASTM B751            |
| Inconel Alloy 601 Buttweld Pipe Fittings | ASTM B366            |
| Inconel Alloy 601 Forgings               | ASTM B564            |

### Chemical Composition, Mechanical & Physical Properties of Alloy 601

#### Chemical Composition of Inconel 601

| Element   | Value %   |
|-----------|-----------|
| Nickel    | 58.0-63.0 |
| Chromium  | 21.0-25.0 |
| Iron      | Remainder |
| Aluminum  | 1.0-1.7   |
| Carbon    | ≤0.10     |
| Manganese | ≤1.0      |

|         |        |
|---------|--------|
| Sulfur  | ≤0.015 |
| Silicon | ≤0.50  |
| Copper  | ≤1.0   |

#### Mechanical & Physical Properties of Inconel 601 (Annealed)

|                                       |           |
|---------------------------------------|-----------|
| Density, g/c m <sup>3</sup>           | 8.11      |
| Melting range, °C                     | 1360-1411 |
| Tensile strength, min, Mpa            | 550       |
| Yield strength, 0.2% offset, min, Mpa | 205       |
| Elongation, %                         | 40        |
| Hardness, Rb                          | 60-80     |

#### What are the Properties of Inconel 601 or Alloy 601?

- Corrosion Resistance: Alloy 601 is firmly resistant to oxidation at the elevated temperature. It also prevents spalling up to 1260oC. Resists spalling even under severe thermal cycling conditions
- Highly resistant to carburization
- Good creep rupture strength
- Metallurgical stability
- Machining: Alloy 601 can be machined using the traditional machining methods. It has greater strength than standard steel grades and work hardens while machining therefore use of heavy duty machining tools is recommended.
- Forming: Alloy 601 is easily formed by standard methods. It is stronger than regular steel. Heavy duty lubricants are used while cold forming.
- Welding: Alloy 601 can be easily welded using the traditional welding techniques.

## What are the Applications of Inconel Alloy 601?

Inconel 601 is widely used for applications demanding high temperature strength and control on oxidation. As it has higher strength as compared to standard grades, it is fit for heavier refractory above 1150 Deg C.. Inconel 601 alloy is used in various applications as below:

- Aerospace
- Heat treating industry
- Heat treating muffles and retorts
- Radiant tubes
- Catalyst support grids in nitric acid production
- Steam superheater tube supports
- Off-Shore Oil Drilling Companies
- Power Generation
- Petrochemicals
- Gas Processing
- Specialty Chemicals
- Pharmaceuticals
- Pharmaceutical Equipment
- Chemical Equipment
- Sea Water Equipment
- Heat Exchangers
- Condensers
- Pulp and Paper Industry

## Types of Nickel Alloys

| ASTM/AISI    | UNS No | EN     | DIN            | JIS    |
|--------------|--------|--------|----------------|--------|
| Incoloy 800  | N08800 | 1.4558 | X2NiCrAlTi3220 | NCF2B  |
| Incoloy 800H | N08810 |        |                |        |
| Incoloy 825  | N08825 | 2.4858 | NiCr21Mo       | NCF825 |
| Inconel 600  | N06600 | 2.4816 | LC-NiCr12Fe    | NCF1B  |

|                |        |        |             |         |
|----------------|--------|--------|-------------|---------|
| Hastelloy B    | N10001 |        |             | N12MV   |
| Hastelloy B2   | N10665 | 2.4617 | NiMo28      |         |
| Hastelloy C    |        |        |             |         |
| Hastelloy C276 | N10276 | 2.4819 | NiMo16Cr15W | NW 0276 |
| Hastelloy C4   | N06455 | 2.461  |             |         |
| Hastelloy C22  | N06022 | 2.4602 |             |         |
| Inconel 625    | N06625 | 2.4856 | NiCr22Mo9Nb |         |
| Inconel 718    | N07718 | 2.4668 |             |         |
| Monel 400      | N04400 | 2.4360 |             | NW 4400 |
| Nickel 200     | N02200 | 2.4060 |             |         |

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