

**This page is mainly introduced the NICKEL 201 Datasheet, including chemical information,mechanical properties, physical properties, mechanical properties, heat treatment, and Micro structure, etc. It also contains the use of NICKEL 201,such as it is commonly used in bars, sheet,plates, steel coils, steel pipes,forged and other materials application.**

## **Datasheet for Steel Grades Superalloys NICKEL 201**

| NICKEL 201 Standard Number: |                                                                    |                                                                                        |
|-----------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| ITEM                        | Standard Number                                                    | Descriptions                                                                           |
| 1                           | UNS N02201                                                         | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 2                           | ASME Code Case 2249                                                | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 3                           | BS 3072 – 3074 (NA12)                                              | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 4                           | ASTM B 160 – B 163, B 366,B 725, B 730, B 751,B 775, B 829         | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 5                           | DIN 17740, 17750 – 17754                                           | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 6                           | ASME SB-160 – SB-163,SB-366, SB-725, SB-730,SB-751, SB-775, SB-829 | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |
| 7                           | ISO 6207, 6208, 9723 – 9725                                        | Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire. |

| NICKEL 201 Chemical composition(mass fraction)(wt.%) |    |    |    |         |    |    |         |    |       |
|------------------------------------------------------|----|----|----|---------|----|----|---------|----|-------|
| Chemical                                             |    |    |    | Min.(%) |    |    | Max.(%) |    |       |
| C                                                    |    |    |    |         |    |    | 0.02    |    |       |
| S                                                    |    |    |    |         |    |    | 0.01    |    |       |
| Si                                                   |    |    |    |         |    |    | 0.35    |    |       |
| Cu                                                   |    |    |    |         |    |    | 0.25    |    |       |
| Ni                                                   |    |    |    | 99      |    |    |         |    |       |
| Fe                                                   |    |    |    |         |    |    | 0.4     |    |       |
| C                                                    | Si | Mn | P  | S       | Cr | Ni | Mo      | V  | Ta    |
|                                                      |    |    |    |         |    |    |         |    |       |
| W                                                    | N  | Cu | Co | Pb      | B  | Nb | Al      | Ti | Other |
|                                                      |    |    |    |         |    |    |         |    |       |

**Commercially pure (99.6%) wrought nickel essentially the same as**

Nickel 200 but with a lower carbon content to prevent embrittlement by intergranular carbon at temperatures over 600°F (315°C). Lower carbon content also reduces hardness, making Nickel 201 particularly suitable for cold-formed items.

## STANDARD PRODUCT FORMS

Pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire.

## PHYSICAL CONSTANTS AND THERMAL PROPERTIES

|                                                                       |               |
|-----------------------------------------------------------------------|---------------|
| Density, lb/in <sup>3</sup> .....                                     | 0.321         |
| g/cm <sup>3</sup> .....                                               | 8.89          |
| Melting Range, °F .....                                               | 2615 – 2635   |
| °C .....                                                              | 1435 – 1446   |
| Specific Heat, Btu/lb•°F .....                                        | 0.109         |
| J/kg•°C.....                                                          | 456           |
| Curie Temperature, °F .....                                           | 680           |
| °C .....                                                              | 360           |
| Permeability .....                                                    | Ferromagnetic |
| Coefficient of Expansion, 70 – 200°F, 10 <sup>-6</sup> in/in •°F..... | 7.3           |
| 21 – 93°C, µm/m• °C.....                                              | 13.1          |
| Thermal Conductivity, Btu • in/ft <sup>2</sup> •h•°F .....            | 550           |
| W/m• °C.....                                                          | 79.3          |
| Electrical Resistivity, ohm• circ mil/ft.....                         | 51            |
| µΩ•m.....                                                             | 0.085         |

## TYPICAL MECHANICAL PROPERTIES

(Annealed)

|                                        |      |
|----------------------------------------|------|
| Tensile Strength, ksi.....             | 58.5 |
| MPa.....                               | 403  |
| Yield Strength (0.2% Offset), ksi..... | 15   |
| MPa.....                               | 103  |
| Elongation, % .....                    | 50   |

### NICKEL 201 Physical Properties

|                  |         |                          |
|------------------|---------|--------------------------|
| Tensile strength | 115-234 | $\sigma_b$ /MPa          |
| Yield Strength   | 23      | $\sigma_{0.2} \geq$ /MPa |
| Elongation       | 65      | $\delta 5 \geq$ (%)      |
| $\psi$           | -       | $\psi \geq$ (%)          |
| Akv              | -       | Akv $\geq$ /J            |
| HBS              | 123-321 | -                        |
| HRC              | 30      | -                        |

### NICKEL 201 Mechanical Properties

|                  |         |                          |
|------------------|---------|--------------------------|
| Tensile strength | 231-231 | $\sigma_b$ /MPa          |
| Yield Strength   | 154     | $\sigma_{0.2} \geq$ /MPa |
| Elongation       | 56      | $\delta 5 \geq$ (%)      |
| $\psi$           | -       | $\psi \geq$ (%)          |
| Akv              | -       | Akv $\geq$ /J            |
| HBS              | 235-268 | -                        |
| HRC              | 30      | -                        |

### NICKEL 201 Heat Treatment Regime

| Annealing | Quenching | Tempering | Normalizing | Q & T |
|-----------|-----------|-----------|-------------|-------|
| √         | √         | √         | √           | √     |

### NICKEL 201 Range of products

| Product type    | Products                        | Dimension         | Processes                                   | Deliver Status                                                |
|-----------------|---------------------------------|-------------------|---------------------------------------------|---------------------------------------------------------------|
| Plates / Sheets | Plates / Sheets                 | 0.08-200mm(T)*W*L | Forging, hot rolling and cold rolling       | Annealed, Solution and Aging, Q+T, ACID-WASHED, Shot Blasting |
| Steel Bar       | Round Bar, Flat Bar, Square Bar | Φ8-1200mm*L       | Forging, hot rolling and cold rolling, Cast | Black, Rough Turning, Shot Blasting,                          |
| Coil / Strip    | Steel Coil /Steel Strip         | 0.03-16.0x1200mm  | Cold-Rolled & Hot-Rolled                    | Annealed, Solution and Aging, Q+T, ACID-WASHED, Shot Blasting |
|                 |                                 |                   |                                             |                                                               |

|               |                                             |                               |                                      |                                                       |
|---------------|---------------------------------------------|-------------------------------|--------------------------------------|-------------------------------------------------------|
| Pipes / Tubes | Seamless Pipes/Tubes,<br>Welded Pipes/Tubes | OD:6-219mm x<br>WT:0.5-20.0mm | Hot extrusion, Cold<br>Drawn, Welded | Annealed, Solution and<br>Aging, Q+T, ACID-<br>WASHED |
|---------------|---------------------------------------------|-------------------------------|--------------------------------------|-------------------------------------------------------|

**We can produce Superalloys the specifications follows:**