

# Incoloy 800 / 800H / 800HT (UNS N08800 / N08810 / N08811) — Material Data Sheet

ASTM B408 Table 6 · UNS N08800 · N08810 · N08811 · Incoloy® alloys 800, 800H, 800HT (Fe-Ni-Cr)

*Iron-nickel-chromium alloy for elevated-temperature service; 800H and 800HT are the controlled-carbon, coarse-grain creep grades*

The economical high-temperature alloy — 32 % nickel, 21 % chromium — for furnace, reformer and heat-exchanger hardware from 1000 to 1800 °F.

|                                |                 |                         |                 |
|--------------------------------|-----------------|-------------------------|-----------------|
| TENSILE, 800 ANNEALED          | 75 ksi min      | NICKEL / CHROMIUM       | 30–35 / 19–23 % |
| TENSILE, 800H / 800HT ANNEALED | 65 ksi min      | MAX SERVICE TEMPERATURE | About 1800 °F   |
| YIELD, 800 / 800H              | 30 / 25 ksi min | MAGNETIC                | No              |

## Nominal composition

■ Fe balance ~ 44.0% ■ Ni ~ 32.50% ■ Cr ~ 21.00% ■ Mn ~ 0.75% ■ Si ~ 0.50% ■ C, Cu, S, Al, Ti, P trace

Midpoints of the specification ranges, for orientation only. Limits are in the table.

## Chemical composition — Incoloy 800 (N08800) per ASTM B408 Table 6

| Element    | Symbol | Min % | Max % |
|------------|--------|-------|-------|
| Nickel     | Ni     | 30.0  | 35.0  |
| Chromium   | Cr     | 19.0  | 23.0  |
| Iron       | Fe     | 39.5  | —     |
| Manganese  | Mn     | —     | 1.5   |
| Carbon     | C      | —     | 0.10  |
| Copper     | Cu     | —     | 0.75  |
| Silicon    | Si     | —     | 1.0   |
| Sulfur     | S      | —     | 0.015 |
| Aluminum   | Al     | 0.15  | 0.60  |
| Titanium   | Ti     | 0.15  | 0.60  |
| Phosphorus | P      | —     | 0.045 |

Values per ASTM B408-22 Table 6 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. 800H: carbon 0.05–0.10 %. 800HT: carbon 0.06–0.10 %, Al 0.25–0.60, Ti 0.25–0.60, Al + Ti 0.85–1.20 %.

## Physical properties (typical)

|                       |                                                    |
|-----------------------|----------------------------------------------------|
| DENSITY               | 0.287 lb/in <sup>3</sup> (7.94 g/cm <sup>3</sup> ) |
| MODULUS OF ELASTICITY | 28.5 × 10 <sup>6</sup> psi (196 GPa)               |
| MELTING RANGE         | 2475–2525 °F                                       |
| MAGNETIC              | No                                                 |

## Heat treatment

Not age hardenable. Alloy 800 is annealed; 800H and 800HT are solution annealed at higher temperature to develop the coarse grain (ASTM 5 or coarser) required for creep service.

## Bar properties — Incoloy 800 / 800H / 800HT per ASTM B408 Table 5

| Condition and size                          | Tensile strength, min (ksi) | Yield strength 0.2%, min (ksi) | Elongation, min (%) |
|---------------------------------------------|-----------------------------|--------------------------------|---------------------|
| N08800 — hot worked, as hot worked          | 80                          | 35                             | 25                  |
| N08800 — cold or hot worked, annealed       | 75                          | 30                             | 30                  |
| N08810 (800H) and N08811 (800HT) — annealed | 65                          | 25                             | 30                  |

Values per ASTM B408-22 Table 5 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

|             |                                            |
|-------------|--------------------------------------------|
| ASTM B408   | Nickel-iron-chromium alloy rod and bar     |
| ASME SB-408 | Boiler and Pressure Vessel Code equivalent |
| ASTM B407   | Alloy 800-series seamless pipe and tube    |
| ASTM B409   | Alloy 800-series plate, sheet and strip    |

Forms we supply in Incoloy 800

- Full-thread studs and stud bolts
- Hex and heavy hex bolts
- Socket head cap screws
- Hex nuts in the same alloy
- Threaded rod
- Machined components from certified bar

Typical applications

- Reformer and cracking-furnace hardware
- Heat exchanger and superheater supports
- Heat-treat furnace fixtures and baskets
- Petrochemical piping bolting at temperature
- Nuclear steam-generator tubing hardware (800)