

INCOLOY® 800

UNS N08800 · W.Nr. 1.4876

Ni–Fe–Cr alloy

Heat- and corrosion-resistant alloy for furnace and petrochemical equipment.

01 PRODUCT INTRODUCTION

INCOLOY 800 was developed for high-temperature strength and resistance to oxidation, carburization and other forms of hot corrosion. It is used for furnace components, petrochemical cracker tubes, pigtails, headers and electric-heater sheathing. The standard 800 grade is not precipitation hardenable; its condition and grain size must be selected for the design temperature and loading mode. The final engineering choice should consider product form, heat-treatment condition, design temperature, loading mode, joining method and the applicable ASTM, AMS, ASME or NACE requirement.

02 ENGINEERING POSITION

Core advantage	High-temperature oxidation, carburization and process-furnace service
Applications	Furnace components · petrochemical cracker tubes · pigtails and headers · electric-heater sheathing
Material class	Ni–Fe–Cr alloy

SELECTION NOTE

Confirm product form, heat treatment, design code, temperature and actual process chemistry before specification.

03 COMMON INDUSTRY USE

Industry focus	Furnace components · petrochemical cracker tubes · pigtails and headers · electric-heater sheathing
Identity	INCOLOY® 800 · UNS N08800

Composition & Physical Data

Official limiting composition and typical physical constants.

04 CHEMICAL COMPOSITION

WEIGHT %

Ni	30–35%	Cr	19–23%
Fe	≥ 39.5%	C	≤ 0.10%
Al + Ti	0.30–1.20%	Mn	≤ 1.50%
Si	≤ 1.00%	Cu	≤ 0.75%

SOURCE CONTROL

Use the applicable ASTM, AMS, ASME or NACE product specification and certified MTR for acceptance.

05 TYPICAL PHYSICAL PROPERTIES

ROOM TEMPERATURE

Density	7.94 g/cm ³	Melting range	1357–1385°C
Specific heat	Approx. 435–450 J/kg·°C	Condition	Annealed / aged
Magnetism	Low permeability	Data status	Typical reference

06 MATERIAL IDENTITY

Common name	INCOLOY® alloy 800
UNS / W.Nr.	N08800 / 1.4876
Alloy family	Ni–Fe–Cr alloy
Product standard	ASTM B163 · B366 · B407 · B409 · B514 · B515 · B519

ACCEPTANCE RULE

Physical and chemistry references do not replace the certified material test report.

Mechanical & Service Performance

Condition-dependent strength and service-selection guidance.

07 MECHANICAL PROPERTIES

Mechanical properties vary by grade, grain size, product form and annealing condition; design stresses are code and temperature dependent.

08 SERVICE PERFORMANCE

Primary service	High-temperature oxidation, carburization and process-furnace service
Oxidation / hot corrosion	Assess atmosphere, carburization, nitriding, sulfidation and thermal cycling for hot service.
Aqueous corrosion	Review chlorides, reducing acids, oxidizing salts and intergranular-corrosion condition.
Creep / rupture	Use code-approved allowable stresses and grade-specific long-term data at temperature.
Welded service	Verify filler metal, heat input, post-weld condition and service environment.

09 TYPICAL APPLICATIONS

Industries	Furnace components · petrochemical cracker tubes · pigtails and headers · electric-heater sheathing
Critical review	Review stress state, thermal cycling, galvanic coupling and environmental contaminants.

IMPORTANT

Official bulletin values are representative. Critical service requires code compliance, certified material data and suitable testing.

Fabrication, Welding & Heat Treatment

Practical controls for maintaining alloy performance.

10 FORMING & MACHINING

Cold forming	Use nickel-alloy tooling practice and account for work hardening where applicable.
Hot working	Use grade-specific temperature windows and avoid prolonged reheating.
Machining	Rigid setup, sharp tooling, positive feed and adequate coolant are recommended.

11 WELDING GUIDANCE

Processes	GTAW, GMAW and SMAW may be used with qualified procedures.
Filler metal	Select grade-compatible filler metal and verify service compatibility.
Heat input	Control interpass temperature, dilution and unnecessary reheating.
Cleanliness	Remove oil, grease, oxides and iron contamination before welding.

12 HEAT TREATMENT

Grade 1 annealed and Grade 2 solution-annealed history is relevant to high-temperature design.

QUALITY CONTROL

Confirm WPS/PQR, filler metal, NDE, heat-treatment records and traceability.

Product Forms, Standards & Procurement

A practical specification and quotation checklist.

13 REFERENCE STANDARDS

ASTM B163 · B366 · B407 · B409 · B514 · B515 · B519

14 COMMON PRODUCT FORMS

Forms	Plate · sheet · strip · bar · wire · pipe · tube · fittings · forgings
Condition	Annealed, solution treated or age hardened by grade and specification

15 RFQ INFORMATION

Material	INCOLOY® 800 · UNS N08800 · governing ASTM/AMS/ASME specification
Dimensions	Form, OD/ID, wall or thickness, tolerances, length and quantity
Testing	Chemistry, tensile, hardness, PMI, NDE and customer-specific tests
Documents	EN 10204 3.1 MTR, heat traceability and compliance certificates

16 TECHNICAL DISCLAIMER

Values shown are typical or specification-level references and may vary by product form, thickness, heat treatment and governing standard. They do not replace engineering design calculations, corrosion review, applicable codes or the certified material test report.

Source basis	Special Metals technical literature and applicable ASTM / ASME / NACE requirements
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