NICKEL 201

UNS N02201 · W.Nr. 2.4068

Commercially Pure Wrought Nickel

Low-carbon commercially pure nickel for elevated-temperature caustic and chemical service.

01 PRODUCT INTRODUCTION

Nickel 201 is the low-carbon version of Nickel 200, with carbon restricted to 0.02% maximum. The reduced carbon content minimizes graphite precipitation during prolonged exposure from about 315°C to 760°C, making Nickel 201 the preferred commercially pure nickel grade for elevated-temperature service. It retains the corrosion resistance, ductility, conductivity and fabrication characteristics associated with pure nickel. Typical uses include caustic evaporators, chemical-processing equipment, electronic components and food-handling systems where cleanliness and resistance to reducing media are important. Final selection should consider product form, temperature, stress, impurities, fabrication route and the governing ASTM or ASME specification.

02 ENGINEERING POSITION

Core advantage	Elevated-temperature caustic and reducing environments where graphitization must be controlled
Applications	High-temperature caustic equipment · evaporators · chemical vessels · food processing · electrical and electronic parts
Material class	Commercially pure wrought nickel

SELECTION NOTE **Use Nickel 201 rather than Nickel 200 for prolonged service above about 315°C where graphitization is a concern.**

03 COMMON INDUSTRY USE

Industry focus	High-temperature caustic equipment · evaporators · chemical vessels · food processing · electrical and electronic parts
Identity	Nickel 201 · UNS N02201

Composition & Physical Data

Limiting composition and typical physical constants.

04 CHEMICAL COMPOSITION

WEIGHT %

Ni + Co	≥ 99.0%	C	≤ 0.02%
Fe	≤ 0.40%	Mn	≤ 0.35%
Si	≤ 0.35%	Cu	≤ 0.25%
S	≤ 0.01%	Mg	Specification limit

CRITICAL DIFFERENCE Carbon is restricted to 0.02% maximum to control graphitization at elevated temperature.

05 TYPICAL PHYSICAL PROPERTIES

Density	8.89 g/cm³	Melting range	1435–1446°C
Thermal cond.	Approx. 70 W/m·K	Specific heat	Approx. 456 J/kg·°C
Elastic modulus	Approx. 204 GPa	Magnetism	Ferromagnetic

06 MATERIAL IDENTITY

Common name	Nickel 201
UNS / W.Nr.	N02201 / 2.4068
Alloy family	Commercially pure wrought nickel
Product standards	ASTM B160 · B161 · B162 · B163 · B725 · B730

ACCEPTANCE RULE Use the governing product specification and certified MTR for final acceptance.

Mechanical & Service Performance

Condition-dependent strength, conductivity and corrosion guidance.

07 MECHANICAL PROPERTIES

Annealed properties are product-form dependent; lower carbon can reduce high-temperature strength compared with Nickel 200.

08 SERVICE PERFORMANCE

Primary service	Elevated-temperature caustic and reducing environments where graphitization must be controlled
Caustic alkalies	Excellent resistance across many concentrations; assess temperature and contaminants.
Reducing media	Good resistance to neutral salts and many reducing environments.
Oxidizing media	Not generally selected for strongly oxidizing acids or oxidizing salts.
Temperature limit	Low carbon makes 201 preferred for prolonged elevated-temperature service.

09 TYPICAL APPLICATIONS

Industries	High-temperature caustic equipment · evaporators · chemical vessels · food processing · electrical and electronic parts
Critical review	Review sulfur compounds, oxidizing contaminants, galvanic coupling and stress state.

IMPORTANT

Typical values are screening data. Product specification, code compliance and certified material data govern final selection.

Fabrication, Welding & Heat Treatment

Practical controls for maintaining pure-nickel performance.

10 FORMING & MACHINING

Cold forming	Excellent ductility; account for work hardening in heavy forming.
Machining	Use sharp tooling, positive feeds and sufficient coolant to avoid built-up edge.
Hot working	Use grade- and product-specific temperature windows and avoid sulfur contamination.

11 WELDING GUIDANCE

Processes	GTAW, GMAW and SMAW may be used with qualified procedures.
Filler metal	Select commercially pure nickel filler compatible with service and specification.
Cleanliness	Remove sulfur-bearing compounds, grease, oxides and iron contamination.
Heat input	Control interpass temperature and avoid unnecessary reheating.

12 HEAT TREATMENT

Not age hardenable. Anneal after heavy cold work as required; low carbon supports prolonged service above 315°C.

QUALITY CONTROL **Confirm WPS/PQR, surface cleaning, annealing condition, NDE and heat-number traceability.**

Product Forms, Standards & Procurement

A practical specification and quotation checklist.

13 REFERENCE STANDARDS

ASTM B160 · B161 · B162 · B163 · B725 · B730 · corresponding ASME SB specifications

14 COMMON PRODUCT FORMS

Forms	Plate · sheet · strip · bar · wire · pipe · tube · fittings
Condition	Annealed, stress relieved or cold worked as specified

15 RFQ INFORMATION

Material	Nickel 201 · UNS N02201 · governing ASTM/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	ASTM / ASME product standards and established commercially pure nickel technical data