CORROSION MATERIALS

"Your Corrosion Alloy Specialist"

"ISO 9001-2008 Certified
ISO Registered Since 1993"

Nickel 200/201

UNS N02200 & N02201/W.Nr. 2.4060/2.4066 & 2.4061/2.4068

Nickel 200 and Nickel 201 are solid solution strengthened, commercially pure wrought materials. Typically, the elemental restrictions of both alloys are combined into one, dual-certified chemistry resulting in a single alloy with the desired characteristics of both alloys. Applications where Nickel 200/201 can be used include chemical processing and storage, synthetic fiber production, and processes where sodium hydroxide and fluorine is used. Other applications include aerospace and defense as well as food processing. Nickel 200/201 has exceptional resistance to caustic alkalies at various temperatures and concentrations.

When operating temperatures are expected to exceed 600°F, carbon content becomes critical. The lower carbon content of Nickel 201 makes the material resistant to graphitization and therefore less subject to embrittlement. Pressure vessels and vessel components can be constructed from Nickel 201 according to the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 for use up to 1250°F.

Resistance to Corrosion

Both Nickel 200 and 201 offer corrosion resistance in reducing and neutral media as well as in oxidizing atmospheres provided that the oxidizing media allows the formation of a passive oxide film. This oxide film accounts for the materials excellent resistance in caustic environments.

Chemical Composition

Ni.....99.0 Min.	Si .....0.35 Max.
Fe .....0.40 Max.	Cu.....0.25 Max.
C .....0.15 Max.	S .....0.01 Max.
Mn.....0.35 Max.	

Physical Properties

Density@ Room Temp.	0.321 lb/in.^{3}
Young's Modulus @ 78°F	29.7 x 10^6 psi
Melting Point	2615°F to 2635°F
Specific Heat @ 70°F	0.109 Btu/lb·°F
Thermal Conductivity @ 70°F	487 Btu·in/ft^2·h·°F
Electrical Resistivity @ 70°F	58 ohm·circ mil/ft

Impact Properties

Condition	Charpy V-Notch
Hot-Rolled	200 ft-lb
Cold-Drawn/Annealed	228 ft-lb

Coefficient of Expansion[A]

Temperature (°F)	10^{-6} in/in • °F
-300	4.7
-100	6.2
200	7.4
600	8.0
1000	8.5
1400	8.9
2000	9.5

A. Mean coefficient of thermal expansion between 70°F and temperature shown.

Mechanical Properties

Room Temperature Properties of Various Products

Product Form	Condition	Tensile (ksi)	0.2% Yield (ksi)	Elongation (%)	Hardness (HRB)
Rod & Bar	Hot Finished	60 to 85	15 to 45	55 to 35	45 to 80
Rod & Bar	Cold-Drawn/Annealed or Hot-Finished/Annealed	55 to 75	15 to 30	55 to 40	45 to 70
Plate	Hot-Rolled/Annealed	55 to 80	15 to 40	60 to 40	45 to 75
Sheet	Annealed	55 to 75	15 to 30	55 to 40	70 Max.
Tube & Pipe - Seamless	Annealed	55 to 75	12 to 30	60 to 40	70 Max.

Fabrication and Heat Treatment

All hot working and cold working practices can be utilized when shaping Nickel 200/201. Hot working temperatures should be between 1200°F and 2250°F with heavy forming to be performed at temperatures above 1600°F. Annealing should be performed at a temperature between 1300°F and 1600°F. Care should be taken when choosing the anneal temperature and time-at-temperature for this can greatly influence the mechanical properties and structure of the material.

Aqueous Corrosion Data

Media	Common Name	Temp. °F (°C)	Corrosion Rate (mpy)
5% CH_3CO_2H w/Air	Acetic Acid	70 (21)	40
10% CH_3CO_2H	Acetic Acid	86 (30)	3.4
56% CH_3CO_2H	Acetic Acid	176 (80)	66
85% CH_3CO_2H w/Air	Acetic Acid	70 (21)	400
98% CH_3CO_2H	Acetic Acid	241 (116)	12
50% NaOH	Caustic Soda	195 (90)	0.55
50% NaOH	Caustic Soda	310 (155)	0.5
75% NaOH	Caustic Soda	250 (120)	1.0
90% CH_2O_2	Formic Acid (liquid)	70 (21)	4
90% CH_2O_2	Formic Acid (vapor)	70 (21)	7
1% HCl	Hydrochloric Acid	214 (101)	680
10% HCl	Hydrochloric Acid	86 (30)	80
10% HCl	Hydrochloric Acid	221 (105)	8000
10% HNO_3	Nitric Acid	216 (102)	12000
10% H_3PO_4	Phosphoric Acid	75 (24)	0.6
10% H_3PO_4	Phosphoric Acid	214 (101)	154
40% H_3PO_4	Phosphoric Acid	75 (24)	1
500 ppm NaClO	Sodium Hypochlorite	77 (25)	0.8
2% H_2SO_4	Sulfuric Acid	70 (21)	2
5% H_2SO_4	Sulfuric Acid	140 (60)	10
5% H_2SO_4 w/Air	Sulfuric Acid	86 (30)	61
19% H_2SO_4	Sulfuric Acid	223 (106)	110
20% H_2SO_4	Sulfuric Acid	70 (21)	4
50% H_2SO_4 w/Air	Sulfuric Acid	86 (30)	16
50% H_2SO_4	Sulfuric Acid	255 (124)	1000
93% H_2SO_4 w/Air	Sulfuric Acid	86 (30)	10

Forms available include bar, plate, sheet, tubular products, wire, flanges, fittings and fasteners.

Applicable Specifications

Nickel 200/201 - Form	ASTM	ASME	British Standard	European Standard
Bar [1,2]	B160, B564[3]	SB160, SB564[3]	BS3076-NA11/NA12	EN 10204-3.1
Plate [1,2]	B162, A480[4]	SB162	BS3072-NA11/NA12	EN 10204-3.1
Sheet [1,2]	B162, A480[4]	SB162	BS3072-NA11/NA12	EN 10204-3.1
Seamless Tube & Pipe [2,5]	B161	SB161	BS3074-NA11/NA12	EN 10204-3.1

1. Hot worked/annealed **2.** Dual certified to UNS N02200/N02201 **3.** Dual certified on diameters 3 1/2" and larger (Nickel 200 only)
4. Flatness specification **5.** Annealed

Please contact Corrosion Materials for a complete list of available items from inventory.

In-house machine and weld facilities help insure that the most common items will be in stock. Items not in stock can be fabricated in a short period of time either in-house or through our extensive, approved subcontractor and supplier network.

We also supply a complete range of items in the following alloys; Alloy C276, B2, B-3®, F-255, Alloy 22, 625, 200/201, Alloy 400, 405 and 600. Bar products are also available in K500, Alloy 800H/HT®, and Alloy 6B as well as various Ti grades.

Baker
2262 Groom Rd.
P.O. Box 630
Baker, Louisiana 70714
(800) 535-8032
(225) 775-3675
FAX: (225) 774-0514

Chicago
375 W. South Frontage Rd.
Bolingbrook, Illinois 60440
(800) 706-7471
(630) 226-1043
FAX: (630) 226-1044

Houston
12305 Cutten Rd.
Houston, Texas 77066
(800) 455-2276
(713) 939-0364
FAX: (713) 939-1126

Shanghai
Room 1202
333 Jiujiang Road
Shanghai, China 200001
86-21-6045 2221/2223
Fax: 86-21-6045 2225