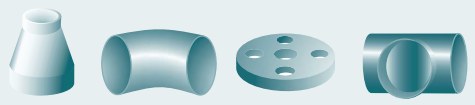


Specifications Alloys 200-201

	Page
Designation and Standards	1
Chemical Composition Mechanical Properties	2
Metallurgical Structure Corrosion Resistance Applications	3-4
Stock Size Range	4



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Alloys 200 and 201

Alloy 200 (UNS N02200) is an unalloyed wrought nickel. It offers excellent corrosion resistance, good mechanical, magnetic and magnetostrictive properties and useful thermal and electrical conductivities.

Alloy 201 (UNS N02201), with reduced carbon content (0.02% max), shows better corrosion resistance at elevated temperatures above 300°C (570°F) by avoiding graphite precipitation.

These alloys are characterised by:

- excellent corrosion resistance in many alkaline media
- good mechanical properties within a wide range of temperatures
- magnetization decreasing continuously between -273 and 360°C (-458 and 680°F) and showing paramagnetism above the Curie point

Designation and Standards

Country National Standard	Material Designation	Chem. composition	Specification						
			Tube and pipe seamless	pipe welded	Sheet and plate	Rod and bar	Strip	Wire	Forgings
France AFNOR									
Germany DIN VdTÜV ²⁾	W.-Nr. 2.4066 Ni 99.2 W.-Nr. 2.4068 LC-Ni 99	17740 345	17751 345	17751 ¹⁾	17750 345	17752 345	17750 345	17753	17754 345
United Kingdom BS	NA11 NA12		3074		3072	3076	3073	3075	
USA ASTM ASME AMS	UNS N02200 N02201		B161/163 SB161/163	B725/730	B162 SB162 5553 ²⁾	B160 SB160	B162 SB162 5553 ²⁾		B564 SB564
ISO	Ni 99.0 LC-Ni 99.0								

1) Ni 99.2 only 2) LC-Ni 99 only

Chemical Composition (%)

Alloy 200	Ni	Fe	C	Mn	Si	Cu	Mg	Ti	Si
min	99.2	-	-	-	-	-	-	-	-
max	-	0.4	0.10	0.3	0.1	0.25	0.05	-	0.005

Alloy 201	Ni	Fe	C	Mn	Si	Cu	Mg	Ti	Si
min	99.2	-	-	-	-	-	-	0.01	-
max	-	0.4	0.02	0.3	0.1	0.25	0.05	0.10	0.005

Mechanical Properties

The following mechanical properties are applicable to Alloys 200 & 201 in the indicated forms and size ranges and in the annealed condition (unless otherwise specified). Material outside these size ranges with agreed properties is subject to special enquiry.

Sheet and plate	up to 50mm	2 in
Strip	0.3 to 3mm	0.012 to 0.12 in
Rod and bar	up to 250mm	10 in
Forgings	up to 150mm	6 in
Tube and pipe wall	1 to 12.5mm	0.04 to 0.5 in
Diameter	6 to 275mm	0.25 to 11 in

	According to spec.	Condition	Tensile strength		0.2% Yield strength		1.0% Yield strength		Elong A5 %
			N/mm ²	ksi	N/mm ²	ksi	N/mm ²	ksi	
Alloy 200	DIN 17750-54	annealed	≥ 380	≥ 55	≥ 100	≥ 14.5	≥ 125	≥ 18.1	≥ 40
	ASTM B 160-163, 725, 730	annealed	≥ 380	≥ 55	≥ 105	≥ 15	-	-	≥ 40
		stress rel.	≥ 450	≥ 65	≥ 275	≥ 40	-	-	≥ 15
	Typical values	annealed	440	63.8	150	21.8	180	26.1	44
Alloy 201	DIN 17750-54, VdTÜV 345	annealed	≥ 340	≥ 49.3	≥ 80	≥ 11.6	≥ 105	≥ 15	≥ 40
	ASTM B 160-163, 725, 730	annealed	≥ 345	≥ 50	≥ 80	≥ 12	-	-	≥ 40
		stress rel.	≥ 415	≥ 60	≥ 205	≥ 30	-	-	≥ 15
	Typical values	annealed	415	60	125	18.1	150	21.8	47

Some standards show greater deviations for 0.2% yield values

Mechanical properties at room temperature

Please Note: The figures quoted are intended for guidance only. For further information, please refer to the standards listed or contact our sales or QA Departments.

Metallurgical Structure

Alloys 200 and 201 have face-centred cubic structures between temperatures close to absolute zero and melting point.

Corrosion Resistance

Alloys 200 and 201 have excellent resistance to many corrosive media from acid to alkaline. They are most useful under reducing conditions but, where a passive oxide is formed, they may also be used in oxidising conditions.

Their most significant property is extremely high resistance to caustic alkalis up to and including the molten state. The extra-low carbon content of Alloy 201 gives virtual immunity to intergranular attack above about 315°C (600°F). The presence of chlorates must be kept to a minimum, as they accelerate the rate of attack.

The resistance of Alloys 200 and 201 to mineral acids varies according to temperature and concentration and whether or not the solution is aerated. Corrosion resistance is better in deaerated acid.

In acid, alkaline and neutral salt solutions, Alloys 200 and 201 show good resistance, but severe attack occurs in oxidising salt solutions. Both alloys are resistant to all dry gases at room temperature. The low-carbon alloy can be used in dry chlorine and hydrogen chloride - at temperatures up to 550°C (1020°F).

Applications

Unalloyed wrought nickel combines excellent mechanical properties with good corrosion resistance. Above 300°C (570°F) working temperature, the low carbon version is efficient. The limited carbon content lowers mechanical, values and work-hardening rate but promotes ductility.

Typical applications include:

- food production, such as handling of cooling brines, fatty acids and fruit juices - resistance to acid, alkaline and neutral salt solutions and to organic acids

Typical applications continued:

- vessels in which fluorine is generated and reacted with hydrocarbons - resistance to fluorine
- storing and transportation of phenol - immunity from any form of attack ensures absolute product purity
- manufacture and handling of sodium hydroxide, particularly at temperatures above 300°C (570°F). Typical industries where sodium hydroxide is used are the:
 - production of viscose rayon and manufacture of soap - general corrosion resistance and virtual immunity to intergranular attack above 315°C (600°F)
 - production of hydrochloride and chlorination of hydrocarbons such as benzene, methane and ethane - resistance at elevated temperatures to dry chlorine and hydrogen chloride
 - manufacture of vinyl chloride monomer - resistance to hydrogen chloride at elevated temperatures

Stock Size Range

Alloy 200/201 - Bar, Tube, Pipe and Fittings

Bar mm dia	Tube mm o/d	Pipe nb sch10 - sch80	Seamless fittings nb
6.35 - 152.4	6.35 - 25.4	1/2" - 6"	1/2" - 6"

Alloy 200/201 - Sheet and Plate

Size	2m x 1m	8' x 4'	2.5m x 1.25m	3m x 1.2m	3m x 1.5m
Thickness	1.6mm	3, 4, 5, 6mm	1 1/2, 2"	2, 3mm	2, 3, 4, 5, 6mm

Size	10' x 5'	4m x 2m	6m x 2m	6.096m x 2.438m
Thickness	1/2", 3/4", 1", 1 1/4"	2, 3, 4, 5, 6, 8, 10mm	-	-

The above tables represent our standard stock range.

Other sizes can be manufactured to order, often with short lead times.