Nickel-Alloys: Standard Nickel Grades

Wire • Bar • Strip • Ribbon

Nickel 200 and Nickel 201 are the most widely used standard grades of commercially available pure wrought Nickel. These alloys offer good thermal conductivity, mechanical properties, resistance against many corrosive environments, in particular against caustic alkalis, low electrical resistivity, and good magnetostrictive properties. Ni 200 is easily workable by forming and drawing. **Nickel 201** is a low carbon variation of Ni 200 and has a very low work hardening rate which allows it to be easily cold formed. It also offers better creep resistance and is preferred over Ni 200 for applications that experience temperatures over 315°F (600°C).

Nickel 205 is used for applications similar to those of Ni 200, but mostly where higher purity and conductivity are required. Ni 205 is produced by compositional adjustments to Ni 200 chemistry. These adjustments help in improving properties needed for electrical and electronic applications.

Specifications

Alloy	British Standard	Werkstoff Nr	UNS designation
Ni 200/201	BS 3075 (NA11)	2.4060	N02200/01
Ni 205/205 LC	-	2.4061	N02205

Nominal Chemical composition (%)

Alloy	Ni	Mn	Fe	Si	Cu	C	Ti
Ni 200	Min 99.2	Max 0.30	Max 0.2	Max 0.10	Max 0.20	Max 0.10	Max 0.10
Ni 201	Min 99.2	Max 0.30	Max 0.2	Max 0.10	Max 0.20	Max 0.05	Max 0.10
Ni 205	Min 99.6	Max 0.20	Max 0.2	Max 0.10	Max 0.10	Max 0.05	Max 0.05
Ni 205 LC	Min 99.6	Max 0.20	Max 0.2	Max 0.10	Max 0.10	Max 0.02	Max 0.05

Physical properties (at room temperature)

Alloy	Density g/cm^3	Thermal Conductivity W/mK	Thermal Linear Expansion Coeff. b/w 20-95° C 10^{-6}/K	Electrical Resistivity at 20° C $\mu\Omega$-cm
Ni 200/201	8.89	70.20	13.3	9.0
Ni 205/205 LC	8.89	75.00	13.3	8.9

Mechanical Properties (for cold drawn annealed wire)

Alloy	Tensile strength N/mm^2		Elongation % at L_o=100 mm Nominal dia in mm	
	Min	Max	Min	Max
Ni 200/201	400	550	20	30
Ni 205/205 LC	400	530	20	30

Applications

Nickel 200 and 201 alloys are used as leads for electrical & electronic components & as lead-in-wire components for lamps. They are used in making wire mesh & filters for chemical & petrochemical industries. They are also used in Ni-Cd batteries, for welding overlay, and for making flux cored wires for welding applications.

Nickel 205 is typically used for transistor housings, lead wires, anodes for electronic valves, and for making wire mesh and filters for chemical and petrochemical industries.

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