Nickel-Manganese Alloys

Wire • Strip • Ribbon

Nickel 211 is similar to Nickel 200 with manganese addition to improve resistance against sulphur at high temperatures. This allows for the use of this alloy in applications where sulphur is present in heating flames, such as in proximity to glass seals. It also retains higher strength than Nickel 200 at higher temperatures.

Nickel 212 is also similar to Nickel 200 with manganese addition to improve strength.

Specifications		
Alloy	Werkstoff Nr	UNS designation
Ni 211	2.4116	N02211
Ni 212	2.4110	N02212

Nominal Chemical Composition (%)						
Alloy	Ni	Mn	Fe	Si	Cu	C
Ni 211	Min 94.0	4.5-5.50	Max 0.30	Max 0.15	Max 0.20	Max 0.10
Ni 212	Min 97.0	1.5-2.20	Max 0.25	Max 0.20	Max 0.30	Max 0.05

Physical properties (at room temperature)				
Alloy	Density g/cm^3	Thermal Conductivity W/m K	Thermal Linear Expansion Coeff. b/w 20-95° C $10^{-6}/K$	Electrical Resistivity at 20°C $\mu\Omega$-cm
Ni 211	8.72	43.00	12.7	17
Ni 212	8.86	44.00	12.9	11

Mechanical Properties (for cold drawn annealed wire)				
Alloy	Tensile strength N/mm^2		Elongation % at $L_0 = 100$ mm	
	Min	Max	Min	Max
Ni 211	500	600	20	30
Ni 212	450	550	20	30

Size Range			
Form	Dia (mm)	Width (mm)	Thickness (mm)
Wire	0.12-8.0	-	-
Strip	-	8-100	⩾ 0.10
Ribbon	-	0.2-0.5	2.0-4.0

Applications

Nickel 211 is used as fuses in light bulbs and grids in vacuum tubes. It is also used in proximity to glass seals because of its enhanced resistance to sulphur based environments.

Nickel 212 is used as fuses for lead-in-wire components in light bulbs. It is also used for lead wires in electrical components. It is also finds use as electrodes in glow discharge lamps.

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