



# Cu Mn13 Ni4

## DESCRIPTION

Niclal 48 is a precision resistance alloy, with moderate Resistivity, low Temperature coefficient of resistance and low thermal EMF versus Copper.

With high stability of electrical resistance, good working properties and very good weldability, Niclal 48 is specially dedicated to precision resistors, electrical shunts which control and measure the current through devices such as electricity meters or DC ammeters.

Brand Name	<b>NICLAL 48</b>	
Abbreviation	<b>Cu - Mn - Ni</b>	
Nominal analysis		
Cu %	Mn %	Ni %
Remain	13	4

## Electrical Properties in annealed temper

Electrical Resistivity at 20 °C	<b>48 <math>\mu\text{ohm} \times \text{cm}</math></b>
Temperature Coefficient of Electrical Resistance between -20 and +150 °C	<b>+/- 20 ppm/°C</b>
Thermo EMF against Copper at 20 °C	<b>- 0.88 <math>\mu\text{V}/^\circ\text{C}</math></b>

## Physical Properties

Density at 20 °C	<b>8.72 g/cm<sup>3</sup></b>
Thermal conductivity at 20 °C	<b>22 W/m x °K</b>
Coefficient of thermal expansion at 20 °C	<b>18 x 10<sup>-6</sup> / °C</b>

## Forms manufactured

Wire (annealed temper)	<b>diameter : 0.8 mm to 14 mm</b>
Rods (1/4 hard temper)	<b>diameter : 1 mm to 19 mm</b>
Strip	<b>thickness : 0.08 mm to 3.5 mm</b> <b>width : 3 mm to 380 mm</b>
Cut to length	<b>thickness : 0.25 mm to 3.5 mm</b> <b>width : 20 mm to 380 mm</b> <b>length : 500 mm to 3500 mm</b>

Resistance Change vs. Temperature - NICLAL 48

