

MANGANINA 43

RESISTANCE HEATING WIRE AND RESISTANCE WIRE

DATASHEET

Manganina 43 is a copper-manganese-nickel alloy (CuMnNi alloy) for use at room temperature. The alloy is characterized by very low thermal electromotive force (emf) compared to copper.

Manganina 43 is typically used for the manufacturing of resistance standards, precision wire wound resistors, potentiometers, shunts and other electrical and electronic components.

The alloy's low emf vs. copper makes it ideal for use in electrical circuits, especially D.C., where a spurious thermal emf could cause malfunctioning of electronic equipment. Due to the low operating temperature, the temperature coefficient of resistance is controlled to be low over a range of 15 to 35°C (59 to 95°F)

CHEMICAL COMPOSITION

	Ni %	Mn %	Cu %
Nominal composition	4.0	11.0	Bal.

MECHANICAL PROPERTIES

Wire size	Yield Strength	Tensile Strength	Elongation	Hardness
Ø	R _{p0.2}	R _m	A	
mm (in)	MPa (ksi)	MPa (ksi)	%	Hv
1.00 (0.04)	180 (26)	390 (57)	30	110

PHYSICAL PROPERTIES

Density g/cm ³ (lb/in ³)	8.4 (0.303)
Electrical resistivity at 20°C Ω mm ² /m (Ω circ. mil/ft)	0.43 (259)
Temperature coefficient of resistance (15 - 35 °C) (x 10 ⁻⁶ /K)	0 ± 15

COEFFICIENT OF THERMAL EXPANSION

Temperature °C (°F)	Thermal Expansion x 10 ⁻⁶ /K (10 ⁻⁶ /°F)
20 - 100 (68-212)	18 (10)

THERMAL CONDUCTIVITY

Temperature °C (°F)	20 (68)
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W m ⁻¹ K ⁻¹ (Btu h ⁻¹ ft ⁻¹ °F ⁻¹)	22 (12.7)
SPECIFIC HEAT CAPACITY	
Temperature °C (°F)	20 (68)
kJ kg ⁻¹ K ⁻¹ (Btu lb ⁻¹ °F ⁻¹)	0.410 (0.10)
Melting point °C (°F)	1020 (1868)
Max continuous operating temperature in air °C	Room temperature
Magnetic properties	The material is non-magnetic

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