



Brand Name	ISATHERM® MINUS¹⁾	
Material Code	2.4122	
Abbreviation	KN / KNX	
Chemical Composition (mass components) in %. Average values of alloy components		
Ni	Mn	Al Si
Balance	5	

Features and Application Notes

ISATHERM® MINUS is used as negative leg of the thermocouple type K. For extension leads, ISATHERM® MINUS is used for KNX. The standardized temperature range of the different application possibilities of ISATHERM® MINUS, is available in the tables of the glossary.

Form of Delivery

ISATHERM® MINUS (KN and KNX) is supplied in the form of bare wire with dimensions from 0.03 to 10.00 mm Ø. We supply coated wires from 0.03 to 1.50 mm Ø. ISATHERM® MINUS can also be supplied in the form of stranded wire, ribbon, flat wire and rods. Please contact us for the range of dimensions. The dimensions 0.81 (AWG 20) and 1.29 mm Ø (AWG 16) in the KPX/EPX version are usually available ex stock.

Thermoelectrical³⁾ and Electrical Values in Soft-Annealed Condition

EMF versus Cu/NIST 175 at +100 °C / mV ⁴⁾	EMF versus Pt67/NIST 175 at +100 °C / mV	EMF versus Pt67/NIST 175 at +1,000 °C / mV	Electrical resistivity in μΩ x cm at +20 °C
-2.056	-1.283	-8.777	27

Physical Characteristics (Reference Values)

Density at +20 °C	Melting point	Specific heat at +20 °C	Thermal conductivity at +20 °C	Average linear thermal expansion coefficient between +20 °C and +100 °C	Magnetic at room temperature
g/cm³	°C	J/g K	W/m K	10⁻⁶/K	
8.60	+1,400	0.52	30.00	16.00	yes

Mechanical Properties at +20 °C in Annealed Condition⁵⁾

	Tensile strength MPa	Elongation %	Hardness HV10
hard	> 1.050	< 2	> 300
soft	600	35	100

Notes on Treatment // ISATHERM® MINUS can be brazed without difficulty. All known welding methods are applicable. However, the alloy is difficult to soft-solder.

Special Remarks on the Alloy // ISATHERM® MINUS reacts corrosively at higher temperatures in the presence of sulphur. Thus the thermoelectric voltage may change dramatically as a result. This oxidation also leads to brittleness of the material.

1) ISATHERM® MINUS is a registered trademark of Isabellenhütte Heusler GmbH & Co. KG, also known as ALUMEL®²⁾ or NiAlCo.

2) ALUMEL® is a registered trademark Concept Alloys, L.L.C.

3) The exact EMF values can be calculated with a "EMF-Software", which can be downloaded from our homepage.

4) Reference at 0 °C.

5) The mechanical values considerably depend on dimension. The indicated values refer to a dimension of 1.0 mm diameter.