



Form of Delivery

ISA[®]-MINUS is supplied in the form of wires with dimensions from 0.05 to 8 mm Ø in bare condition. Enamelled wires are available in dimensions between 0.05 and 1.5 mm Ø.

ISA[®]-MINUS can also be supplied in form of stranded wire, ribbon, flat wire and rods. Please contact us for the range of dimensions.

| | | | |
|--|---------------------------------------|----|----|
| Brand Name | ISA [®] -MINUS ¹⁾ | | |
| Material Code | | | |
| Abbreviation | KNCA | | |
| Chemical Composition (mass components) in %. | | | |
| Average values of alloy components | | | |
| Cu | Ni | Mn | Fe |
| Balance | 45 | 2 | 2 |

Thermoelectrical and Electrical Values in Soft-Annealed Condition

| EMF versus Cu/NIST 175 0 – 100 °C / mV | EMF versus Pt67/NIST 175 0 – 100 °C / mV | EMF versus Cu 0 – 200 °C / mV | EMF versus Pt67/NIST 175 0 – 200 °C / mV | Electrical resistivity in µΩ x cm at 20 °C |
|---|---|----------------------------------|---|--|
| - 3.00 | - 2.23 | - 6.495 | - 4.659 | 51 |

Features and Application Notes

ISA[®]-MINUS is used as negative leg for compensating lead KCA as well as positive leg for compensating lead type W5Re/W26Re. ISA[®]-MINUS is standardized in the temperature range between 0 and 150 °C. ISABELLENHÜTTE supplies ISA[®]-MINUS in standardized tolerances up to 200 °C.

Physical Characteristics (Reference Values)

| Density at 20 °C | Melting point | Specific heat at 20 °C | Thermal conductivity at 100 °C | Average linear thermal expansion coefficient between 20 °C and 100 °C | Magnetic at room temperature |
|-------------------|---------------|------------------------|--------------------------------|---|------------------------------|
| g/cm ³ | °C | J/g K | W/m K | 10 ⁻⁶ /K | |
| 8.9 | approx. 1280 | 0.41 | 23 | 13.5 | no |

Mechanical Properties at 20 °C in Annealed Condition ²⁾

| | Tensile strength MPa | Elongation % | Hardness HV10 |
|------|-------------------------|-----------------|------------------|
| hard | > 840 | < 2 | > 240 |
| soft | 500 | 30 | 120 |

- 1) ISA[®]-MINUS is a registered trademark of Isabellenhütte Heusler GmbH & Co. KG.
- 2) The mechanical values considerably depend on dimension. The indicated values refer to a dimension of 1 mm diameter.

Notes on Treatment

ISA[®]-MINUS is easy to process. The alloy can be soldered and brazed without difficulty. All known welding methods are applicable.