



# ISABELLENHÜTTE

## Form of Delivery

NISIL (NN und NNX) is supplied in the form of bare wire with dimensions from 0.10 to 6 mm Ø. We supply coated wires from 0.10 to 1.5 mm Ø. NISIL can also be supplied

in the form of stranded wire, ribbon, flat wire and rods. Please contact us for the range of dimensions.

Brand Name	<b>NISIL</b>		
Material Code			
Abbreviation	<b>NN (X)</b>		
Chemical Composition (mass components) in % Average values of alloy components			
Ni	Si		
<b>Balance</b>	<b>4.8</b>		

## Thermoelectrical and Electrical Values in Soft-Annealed Condition <sup>1)</sup>

EMF versus Cu/NIST 175 0 – 100 °C / mV	EMF versus Pt67/NIST 175 0 – 100 °C / mV	EMF versus Pt67/NIST 175 0 – 1000 °C / mV	Electrical resistivity in $\mu\Omega \times \text{cm}$ at 20 °C
<b>- 1.763</b>	<b>- 0.990</b>	<b>- 10.210</b>	<b>34</b>

## 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
$\text{g/cm}^3$	°C	J/g K	W/m K	$10^{-6}/\text{K}$	
<b>8.55</b>	<b>1341</b>	<b>0.50</b>	<b>14</b>	<b>12.7</b>	<b>slight</b>

## Mechanical Properties at 20 °C in Annealed Condition <sup>2)</sup>

	Tensile strength MPa	Elongation %	Hardness HV10
<b>hard</b>	<b>&gt; 1200</b>	<b>&lt; 2</b>	<b>450</b>
<b>soft</b>	<b>620</b>	<b>35</b>	<b>130</b>

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

2) The mechanical values considerably depend on dimension. The indicated values refer to a dimension of 1 mm diameter.

## Notes on Treatment

NISIL can be brazed without difficulty. All known welding methods are applicable.

However, the alloy is difficult to soft-solder. See also "Special Remarks on the Alloy".

## Special Remarks on the Alloy

NISIL has been developed as a counterleg to Nicrosil. By increasing the silicon and reducing the aluminium concentration versus the negative leg of thermocouple type K (KN), a higher oxidation stability has been achieved. Consequently, compared to KN the corrosive reaction to sulphur will be lower at higher working temperatures.

## Features and Application Notes

NISIL is used as negative leg of the thermocouple type N.

In the version for extension leads NISIL is used for type NNX.

The standardized temperature range of the different application possibilities of NISIL is available in the tables on pages 10 and 11 as well as 14 and 15.

See also "Special Remarks on the Alloy".