

NISIL THERMOCOUPLE WIRE

DATASHEET

Nisil is an austenitic nickel-silicon alloy (NiSi alloy) used for the negative leg of thermocouples type N. It offers higher thermoelectric stability in air above 1000°C (1830°F) and better oxidation resistance than type E, J and K thermocouples.

Nisil alloy can not be exposed to sulphur-containing gases. This thermocouple alloy is the most recent one among the different types covered by the international standards.

CHEMICAL COMPOSITION

	Ni %	Si %	Mg %
Nominal composition	Bal.	4.3	0.1

MECHANICAL PROPERTIES

Wire size	Yield strength	Tensile strength	Elongation
∅	R _{p0.2}	R _m	A
mm	MPa	MPa	%
2.00	300	680	33

PHYSICAL PROPERTIES

Density g/cm ³	8.585
Electrical resistivity at 20°C Ω mm ² /m	0.365
Temperature coefficient of resistance between 20°C and 100°C x 10 ⁻⁶ /K	680

COEFFICIENT OF THERMAL EXPANSION

Temperature °C	Thermal Expansion x 10 ⁻⁶ /K
20 - 100	17

THERMAL CONDUCTIVITY

Temperature °C	
	100
W m ⁻¹ K ⁻¹	27

Melting point °C	1420
Magnetic properties	The material is non-magnetic

RECOMMENDED MAXIMUM CONTINUOUS OPERATING TEMPERATURES

Wire size Ø	3.26	1.63	1.00	0.50	0.25
Bare wire °C	1100	1010	960	890	800
Protected wire °C	1250	1180	1110	1000	910

Note that the indicated temperatures should be considered as guide values

THERMOELECTRIC PROPERTIES

NOMINAL EMF VALUES VS NICROSIL

Temp °C	mV
100	2.774
200	5.913
300	9.341
400	12.974
500	16.748
600	20.613
700	24.527
800	28.455
900	32.371
1000	36.256
1100	40.087
1200	43.846
1300	47.513

ITS90- Reference junction 0°C

Disclaimer: Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Kanthal materials.