

**Thermocouple Alloys for Type N Thermocouple and Extension Wires****Nicrosil + & Nisil -**

IMI Scott Nicrosil and Nisil alloys are available in solid wire, strip or tape and flexible bunch or strand constructions. Material can be ordered to all National or International emf standards as well as customer's own specifications.

Physical and Mechanical Properties (Values stated are nominal or typical.)

		Units	Nicrosil +	Nisil -
Nominal composition		%	Ni 84.4 Si 1.4 Cr 14.2	Ni 95.6 Si 4.4
Density at 20°C		g/cm <sup>3</sup>	8.5	8.6
Resistivity at 20°C		μΩcm	99	35
Temperature Coefficient of resistance	20 – 100°C	1/K	0.00009	0.00068
Coefficient of thermal expansion	20 – 100°C	1/K	16 x 10 <sup>-6</sup>	16 x 10 <sup>-6</sup>
Thermal conductivity at	20°C	W/mK	14	28
Melting point (approx.)		°C	1415	1380
Magnetic properties at 20°C			Non-Magnetic	Slight
Tensile strength R <sub>m</sub> (0.5mm annealed wire)		N/mm <sup>2</sup>	760	620

Type N thermocouple wire has greater emf stability and corrosion resistance than Type K, however the combination develops a lower emf output and cannot, therefore, be directly substituted. The combination is not immune to corrosion and the following environments can cause detrimental effects:

- 'Green rot' can develop on the Nicrosil+ due to the preferential oxidation of Chromium occurring in a reducing or mildly oxidising atmosphere where the partial pressure of oxygen is low. The removal of Chromium from the alloy is accompanied by a significant emf drop and embrittlement.
- Sulphur reacts corrosively with the Nisil- at higher temperatures.

*Information contained within this technical data sheet is based upon the general experience of IMI Scott Ltd and is believed to be correct at the time of issue. No warranty is given or is to be implied from the details above. Customers are advised to carry out independent tests in order to determine the suitability of any IMI Scott Ltd product for an application.*