

# KANTHAL

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## Nikrothal 80

Nikrothal 80 is an austenitic nickel-chromium alloy (NiCr alloy) for use at temperatures up to 1200°C (2190°F). The alloy is characterized by high resistivity, good oxidation resistance and very good form stability. It has good ductility after use and excellent weldability.

Nikrothal 80 is used for electric heating elements in home appliances and industrial furnaces. Typical applications are flat irons, ironing machines, water heaters, plastic moulding dies, soldering irons, metal sheathed tubular elements and cartridge elements.

Due to extremely good adhesion properties of the surface oxide, Nikrothal 80 offers superior service life compared to competitive nickel-chromium alloys.

### Chemical composition

	C %	Si %	Mn %	Cr %	Ni %	Fe %	Trace elements
<b>Nominal composition</b>					Bal.		Added
<b>Min</b>	-	1.0	-	19.0	-	-	-
<b>Max</b>	0.10	1.7	1.0	21.0	-	2.0*	-

\* Fe < 1.0 on request

### Mechanical properties

Wire size	Yield strength	Tensile strength	Elongation	Hardness
Ø	R <sub>p0.2</sub>	R <sub>m</sub>	A	
mm	MPa	MPa	%	Hv
1.0	420	810	30	180
4.0	300	725	30	160

### Mechanical properties at elevated temperature

Temperature °C	900
MPa	100

Ultimate tensile strength - deformation rate  $6.2 \times 10^{-2}/\text{min}$

### Creep strength - 1% elongation in 1000 h

Temperature °C	800	1000
MPa	15	4

### Physical properties

Density $\text{g}/\text{cm}^3$	8.30
Electrical resistivity at 20°C $\Omega \text{mm}^2/\text{m}$	1.09

### Temperature factor of resistivity

Temperature °C	100	200	300	400	500	600	700	800	900	1000	1100	1200
Ct	1.01	1.02	1.03	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.06	1.07

### Coefficient of thermal expansion

Temperature °C	Thermal Expansion $\times 10^{-6}/\text{K}$
20 - 250	14.1
20 - 500	14.9
20 - 750	16.0
20 - 1000	17.2

### Thermal conductivity

Temperature °C	20	100	200	300	400	500	600	700	800	900	1000	1100
$\text{W m}^{-1} \text{K}^{-1}$	15	15	15	15	17	19	21	22	24	26	28	30

### Specific heat capacity

Temperature °C	20	100	200	300	400	500	600	700	800	900	1000	1100
$\text{kJ kg}^{-1} \text{K}^{-1}$	0.46	0.46	0.48	0.50	0.52	0.54	0.56	0.60	0.63	0.65	0.67	0.70

Melting point °C	1400
Max continuous operating temperature in air °C	1200

**Magnetic properties**

The material is  
non-magnetic

**Emissivity - fully oxidized material**

0.88

**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.

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