

Nikrothal 60

(Resistance heating wire and resistance wire)

Nikrothal 60 is an austenitic nickel-chromium alloy (NiCr alloy) for use at temperatures up to 1150°C (2100°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 60 is used in electric heating element material in domestic appliances. Typical applications are metal sheathed tubular elements used in, for example, hot plates, grills, toaster ovens and storage heaters. The alloys is also used for suspended coils in air heaters in clothes dryers, fan heaters, hand dryers.

CHEMICAL COMPOSITION

| | C % | Si % | Mn % | Cr % | Ni % | Fe % |
|----------------------------|------|------|------|------|------|------|
| Nominal composition | | | | | | Bal. |
| Min | - | 1.0 | - | 14.0 | 57.0 | |
| Max | 0.10 | 1.7 | 1.0 | 18.0 | 60.0 | |

MECHANICAL PROPERTIES

| Wire size | Yield strength | Tensile strength | Elongation | Hardness |
|-----------|-------------------|------------------|------------|----------|
| Ø | R _{p0.2} | R _m | A | |
| mm | MPa | MPa | % | Hv |
| 1.0 | 370 | 730 | 35 | 180 |
| 4.0 | 300 | 700 | 30 | 160 |

MECHANICAL PROPERTIES AT ELEVATED TEMPERATURE

| Temperature °C | 900 |
|----------------|-----|
| MPa | 100 |

Ultimate tensile strength - deformation rate 6.2×10^{-2} /min

CREEP STRENGTH - 1% ELONGATION IN 1000 H

| Temperature °C | 800 | 1000 |
|----------------|-----|------|
| MPa | 15 | 4 |

PHYSICAL PROPERTIES

| | |
|--|------|
| Density g/cm ³ | 8.20 |
| Electrical resistivity at 20°C Ω m ² /m | 1.11 |

TEMPERATURE FACTOR OF RESISTIVITY

| Temperature °C | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ct | 1.02 | 1.04 | 1.05 | 1.06 | 1.08 | 1.09 | 1.09 | 1.10 | 1.10 | 1.11 | 1.12 | 1.13 |

COEFFICIENT OF THERMAL EXPANSION

| Temperature °C | Thermal Expansion x 10 ⁶ /K |
|----------------|--|
| 20 - 250 | 14 |
| 20 - 500 | 15 |
| 20 - 750 | 16 |
| 20 - 1000 | 17 |

THERMAL CONDUCTIVITY

| Temperature °C | 20 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 |
|-----------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| W m ⁻¹ K ⁻¹ | 13 | 13 | 14 | 16 | 17 | 19 | 20 | 22 | 24 | 25 | 25 | 29 |

SPECIFIC HEAT CAPACITY

| Temperature °C | 20 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| kJ kg ⁻¹ K ⁻¹ | 0.46 | 0.46 | 0.48 | 0.50 | 0.53 | 0.55 | 0.58 | 0.60 | 0.63 | 0.66 | 0.68 | 0.71 |

| | |
|---|-----------------------------------|
| Melting point °C | 1390 |
| Max continuous operating temperature in air °C | 1150 |
| Magnetic properties | The material is slightly 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.