

KANTHAL® Super HT

High Temperature Element for Cycling Conditions

KANTHAL Super HT is a new electric heating element in KANTHAL Super family, with outstanding properties for use at high temperatures, in air or oxygen, in cycling conditions.

The maximum operating temperature is 1830°C (3330°F), and the element is suitable for furnace temperatures between 1500 – 1750°C (2730 – 3180°F) approximately.

The special feature of KANTHAL Super HT is that the growth of the oxide layer – the glaze – is much reduced, compared to KANTHAL Super 1800 and 1900. A thin oxide layer results in a much-improved lifetime, because



the tensions are reduced between the base material and the surrounding oxide, depending on the different thermal expansion coefficients.

This is of great importance, especially for elements of smaller dimensions used in cyclic conditions, where KANTHAL Super 1800 and 1900 elements may be damaged by “banding”. The banding effect means that an element shatters into small pieces during thermal cycling. This is as a result of massive stresses between the oxide and the base material, once the oxide has grown to a sufficient thickness, and the strength of the oxide film exceeds that of the base material.

The new properties also include a better hot strength and form stability. KANTHAL Super HT therefore, can be used in horizontal applications with less deformation, although it still needs to be supported.

Special Features

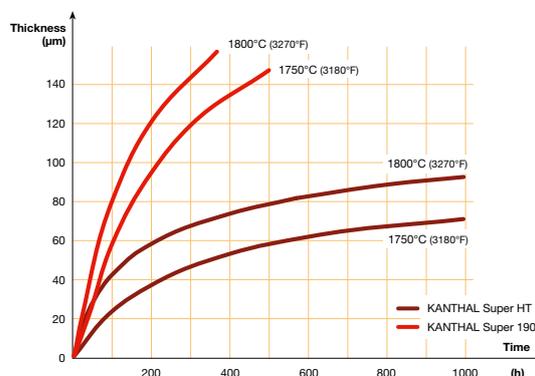
- Lower oxidation rate
- Thinner glaze layer
- Longer life at high temperatures and when cycling
- Less adhesion to fiber due to thinner glaze
- Improved form stability
- High purity – reduced Fe
- Standard and specially designed elements



Applications

KANTHAL Super HT is used in laboratory and high-temperature process furnaces and as a “problem solver” at high temperatures.

Growth of Oxide Layer in Air

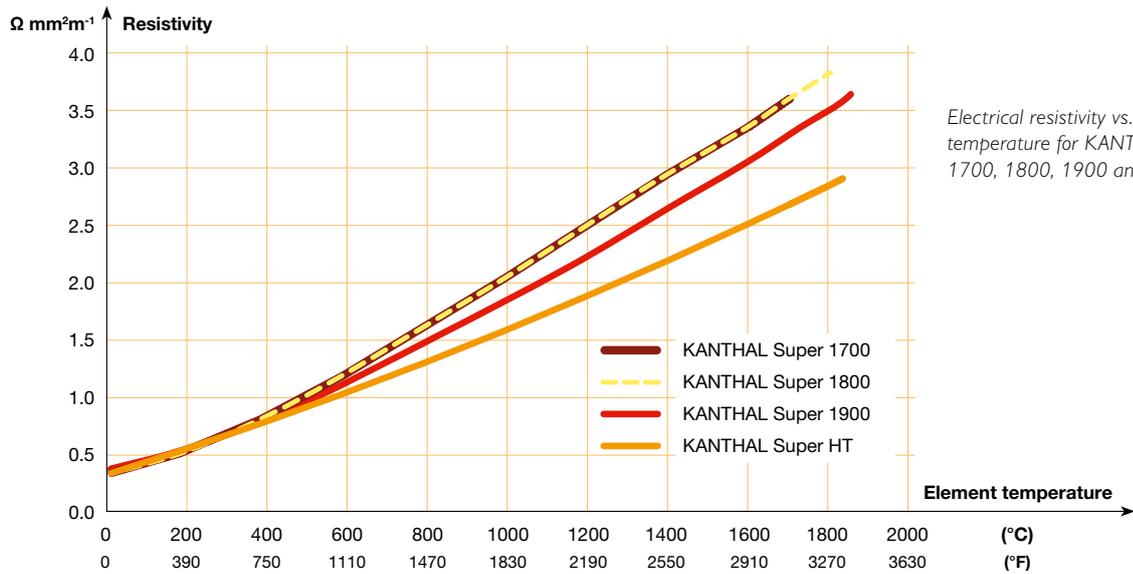


Product Range

KANTHAL Super HT is delivered as 2- and 4-shank elements with fixed terminals as standard for safe and reliable electrical connections. Special designs are available on request.

KANTHAL Super HT	Heating zone diam. Le, mm (in.)	Terminal diam. Lu, mm (in.)
(Special)	2.5 (0.10)	6 (0.24)
	3 (0.12)	6 (0.24)
	4 (0.16)	9 (0.35)

Resistivity



Properties

Maximum operating temperature	1830°C (3330°F)
Composition	Mainly MoWSi ₂ + reinforced phase
Tensile strength at 1550°C (2820°F)	100 Mpa ±25 %
Bending strength at 20°C (68°F)	350–400 Mpa ±10 %
Compression strength at 20°C (68°F)	1400–1500 Mpa
Creep rate, sagging	Lower than KANTHAL Super 1800 and 1900
Oxidation, weight gain	Lower than KANTHAL Super 1800 and 1900
Density	7 g/cm ³ (0.25 lb/in ³)
Fracture toughness, K_{IC}	4 MPa √m ^{1/2}
Hardness, Hv	8 Gpa
Thermal conductivity	
20–600°C (68–1110°F)	30 Wm ⁻¹ K ⁻¹
600–1200°C (1110–2190°F)	15 Wm ⁻¹ K ⁻¹
Coefficient of linear expansion	7–8 10 ⁻⁶ K ⁻¹
Specific heat capacity at 20°C (68°F)	0.42 kJ kg ⁻¹ K ⁻¹
Emissivity	0.70–0.80

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KANTHAL

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Kanthal AB, Box 502, 734 27 Hallstahammar, Sweden Phone +46 220 21000 Fax +46 220 21166 www.kanthal.com