

## PHYSICAL AND MECHANICAL PROPERTIES OF COMMON HEATING ELEMENT MATERIALS

		KANTHAL APM	KANTHAL A-1	KANTHAL D	NIKROTHAL 80 Plus
Max continuous operating temp., °C		1400	1400	1300	1200
Nominal Composition, %	Cr	22	22	22	20
	Al	5.8	5.8	4.8	-
	Fe	Rest	Rest	Rest	
	Ni	-	-	-	80
Resistivity at 20°C, mm <sup>2</sup> m <sup>-1</sup>		1.45	1.45	1.35	1.09
Density, g/cm <sup>3</sup>		7.10	7.10	7.25	8.3
Coefficient of thermal expansion, K <sup>-1</sup> : 20- 750°C		14.10 <sup>-6</sup>	14.10 <sup>-6</sup>	14.10 <sup>-6</sup>	17.10 <sup>-6</sup>
Thermal conductivity at 20°C W m <sup>-1</sup> K <sup>-1</sup>		13	13	13	15
Specific heat capacity KJ kg <sup>-1</sup> K <sup>-1</sup> , 20°C		0.46	0.46	0.46	0.46
Melting point, °C		1500	1500	1500	1400

Mechanical properties (approx.)**					
Tensile strength, N mm <sup>-2</sup>		680	680	680	750
Yield point, N mm <sup>-2</sup>		445	445	445	450
Hardness, Hv		230	230	230	180
Elongation at rupture, %		19	19	19	30
Tensile strength at 900°C, N mm <sup>-2</sup>		40	34	34	100
Creep strength at 800°C, N mm <sup>-2</sup>		14	6	6	15
1000°C, N mm <sup>-2</sup>		1.8	1	1	4
Magnetic properties		Magnetic (Curie point 600°C)			Non-mag
Emissivity, fully oxidized condition		0.70	0.70	0.70	0.88
Melting point, °C		1500	1500	1500	1400

\* For maximum element life above 1300°C KANTHAL A-1 or APM is recommended.

\*\* The values given apply for sizes of 4 mm for the KANTHAL alloys and 1 mm for the NIKROTHAL alloys