KANTHAL

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Kanthal D

(Resistance heating wire and resistance wire)

Kanthal D is a ferritic iron-chromium-aluminium alloy (FeCrAl alloy) for use at temperatures up to 1300°C (2370°F). The alloy is characterized by high resistivity and good oxidation resistance.

Kanthal D is used in home appliances and industrial furnaces. Typical applications in home appliances include metal sheathed tubular elements for dishwashers, elements embedded in ceramics for panel heaters, cartridge elements in metal dies, heating cables and rope heaters in defrosting and deicing elements, mica elements used in irons, quartz tube heaters for space heating, industrial infrared dryers, in coils on molded ceramic fibre for boiling plates with ceramic hobs, in bead insulated coils for panel heaters, in suspended coil elements for air heaters in laundry dryers.

In industrial applications Kanthal D is used in, for example, terminals to furnace elements, porcupine elements for air heating, and in furnace heating elements.

CHEMICAL COMPOSITION

	C %	Si %	Mn %	Cr %	Al %	Fe %
Nominal composition					4.8	Bal.
Min	-	-	-	20.5	-	
Max	0.08	0.7	0.5	23.5	-	

MECHANICAL PROPERTIES

Wire size	Yield strength	Tensile strength	Elongation	Hardness
Ø	$R_{p0.2}$	R_m	A	
mm	MPa	MPa	%	Hv
1.0	485	670	23	230
4.0	450	650	18	230

MECHANICAL PROPERTIES AT ELEVATED TEMPERATURE

Temperature °C	**900**
MPa	34

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

CREEP STRENGTH - 1% ELONGATION IN 1000 H

Temperature °C	**800**	**900**
MPa	1.2	0.5

PHYSICAL PROPERTIES

Density g/cm^3	7.25
Electrical resistivity at 20°C Ω mm^2/m	1.35
Poisson's ratio	0.30

YOUNG'S MODULUS

Temperature °C	20	100	200	400	600	800	1000
GPa	220	210	205	190	170	150	130

TEMPERATURE FACTOR OF RESISTIVITY

Temperature°C	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
Ct	1.00	1.01	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.07	1.07	1.08	1.08

COEFFICIENT OF THERMAL EXPANSION

Temperature °C	Thermal Expansion x 10^{-6}/K
20 - 250	11
20 - 500	12
20 - 750	14
20 - 1000	15

THERMAL CONDUCTIVITY

Temperature °C	50	600	800	1000	1200
W m^{-1} K^{-1}	11	20	22	26	27

SPECIFIC HEAT CAPACITY

Temperature °C	20	200	400	600	800	1000	1200
kJ kg^{-1} K^{-1}	0.46	0.56	0.63	0.75	0.71	0.72	0.74

Melting point °C	1500
Max continuous operating temperature in air °C	1300
Magnetic properties	The material is magnetic up to approximately 600°C (Curie point).
Emissivity - fully oxidized material	0.70