

KANTHAL® D RESISTANCE HEATING WIRE AND RESISTANCE WIRE

DATASHEET

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 (in)	MPa (ksi)	MPa (ksi)	%	Hv
1.0 (0.04)	485 (70)	670 (97)	23	230
4.0 (0.16)	450 (65)	650 (94)	18	230

MECHANICAL PROPERTIES AT ELEVATED TEMPERATURE

Temperature °C (°F)	900 (1652)
MPa (ksi)	34 (4.9)

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

CREEP STRENGTH - 1% ELONGATION IN 1000 H

Temperature °C (°F)	800 (1472)	900 (1652)
MPa (psi)	1.2 (170)	0.5 (73)

PHYSICAL PROPERTIES

Density g/cm ³ (lb/in ³)	7.25 (0.262)
Electrical resistivity at 20°C Ω mm ² /m (Ω circ. mil/ft)	1.35 (812)
Poisson's ratio	0.30

YOUNG'S MODULUS

Temperature °C	20	100	200	400	600	800	1000
Temperature °F	68	212	392	752	1112	1472	1832
GPa	220	210	205	190	170	150	130
Msi	32	30	30	28	25	22	19

TEMPERATURE FACTOR OF RESISTIVITY

Temperature °C	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
Temperature °F	212	392	572	752	932	1112	1292	1472	1652	1832	2012	2192	2372
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 (°F)	Thermal Expansion $\times 10^{-6}$ /K (10^{-6} /°F)
20 - 250 (68-482)	11 (6.1)
20 - 500 (68-932)	12 (6.7)
20 - 750 (68-1382)	14 (7.8)
20 - 1000 (68-1832)	15 (8.3)

THERMAL CONDUCTIVITY

Temperature °C	50	600	800	1000	1200
----------------	----	-----	-----	------	------

Temperature °F	122	1112	1472	1832	2192
W m ⁻¹ K ⁻¹	11	20	22	26	27
Btu h ⁻¹ ft ⁻¹ °F ⁻¹	6.4	11.6	12.7	15.0	15.6

SPECIFIC HEAT CAPACITY

Temperature °C	20	200	400	600	800	1000	1200
Temperature °F	68	392	752	1112	1472	1832	2192
kJ kg ⁻¹ K ⁻¹	0.46	0.56	0.63	0.75	0.71	0.72	0.74
Btu lb ⁻¹ °F ⁻¹	0.11	0.13	0.15	0.18	0.17	0.17	0.18

Melting point °C (°F)	1500 (2732)
Max continuous operating temperature in air °C (°F)	1300 (2372)
Magnetic properties	The material is magnetic up to approximately 600°C (1112°F)(Curie point).
Emissivity - fully oxidized material	0.70

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 materials under the trademark Kanthal®.