



Stainless Steel



TEMCo Kanthal Wire Data Sheet

Shape: Round
Heat treatment: Annealed (soft)



	Kanthal A-1	Kanthal D
Max. operating temp:	1400°C (2550°F)	1300°C (2370°F)
Nominal composition:	22% Cr 5.8% Al Fe balance	22% Cr 4.8% Al Fe balance
Density:	7.1 g/cubic cm (0.256 lbs/cubic in.)	7.25 g/cubic cm (0.262 lbs/cubic in.)
Thermal conductivity at 50°C (122°F):	11 W/m K (76 Btu in/ft ² h°F)	11 W/m K (76 Btu in/ft ² h°F)
Tensile strength:	680 N/mm ² (98600 psi)	670 N/mm ² (97200 psi)
Yield point:	545 N/mm ² (79000 psi)	485 N/mm ² (70300 psi)
Hardness:	240 Hv	230 Hv
Elongation at rupture:	20%	22%
Tensile strength at 900°C (1650°F):	34 N/mm ² 4900 psi	34 N/mm ² 4900 psi
Emissivity, full oxidized condition:	0.7	0.7



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Temperature Factor of Resistivity

Temperature	Kanthal A-1	Kanthal D
68°F (20°C)	1.00	1.00
212°F (100°C)	1.00	1.00
392°F (200°C)	1.01	1.01
572°F (300°C)	1.01	1.01
752°F (400°C)	1.02	1.02
932°F (500°C)	1.03	1.03
1112°F (600°C)	1.04	1.04
1292°F (700°C)	1.04	1.05
1472°F (800°C)	1.05	1.06
1652°F (900°C)	1.05	1.07
1832°F (1000°C)	1.06	1.07
2012°F (1100°C)	1.06	1.07
2192°F (1200°C)	1.06	1.08
2372°F (1300°C)	1.06	1.08

Electrical Resistance at Operating Temperature

$$R = \frac{R_t}{F} \text{ (ohms)}$$

F = Temperature factor of resistivity

R = Element resistance at 20°C (Ohms)

R_t = Element resistance at operating temperature (Ohms)

Linear Thermal Expansion Coefficient

Temperature	Kanthal A-1	Kanthal D
20-250°C (68-480°F)	11	11
20-500°C (68-930°F)	12	12
20-750°C (68-1380°F)	14	14
20-1000°C (68-1840°F)	15	15

Creep Strength

Temperature	Kanthal A-1	Kanthal D
800°C (1470°F)	1.2 N/mm ² (170 psi)	1.2 N/mm ² (170 psi)
1000°C (1830°F)	0.5 N/mm ² (70 psi)	0.5 N/mm ² (70 psi)



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Kanthal A-1

Gauge	Feet/lb.	Ohms/ft @ Room Temp	Diameter (mm)	Diameter (in.)
16	159	0.324	1.29032	0.0508
18	253	0.515	1.02362	0.0403
20	401	0.817	0.817	0.032
22	641	1.31	0.64262	0.0253
24	1018	2.07	0.51054	0.0201
26	1626	3.31	0.40386	0.0159
27	2040	4.15	0.36068	0.0142
28	2609	5.27	0.32004	0.0126
29	3226	6.55	0.28702	0.0113
30	4142	8.36	0.25400	0.0100
31	5181	10.6	0.22606	0.0089
32	6473	13.1	0.20320	0.0080
33	8217	16.6	0.18034	0.0071
34	10437	21.1	0.16002	0.0063
36	16447	33.4	0.12700	0.0050

Kanthal D

26	1602	3.21	0.40389	0.0159
36	16207	32.5	0.12700	0.0050