



Nichrome Wire

A common alloy is 80% nickel and 20% chromium, by mass, but there are many others to accommodate various applications. It is silvery-grey in colour, is corrosion-resistant, and has a high melting point of about 1,400 °C (2,550 °F). Due to its resistance to oxidation and stability at high temperatures, it is widely used in electric heating elements, such as in appliances and tools. Typically, nichrome is wound in coils to a certain electrical resistance, and current is passed through it to produce heat.

Uses

Nichrome is used in a very wide variety of devices where electric heating is required.

Nichrome is used in the explosives and fireworks industry as a bridgewire in electric ignition systems, such as electric matches and model rocket igniters.

Industrial and hobby hot-wire foam cutters use nichrome wire.

Nichrome wire is commonly used in ceramic as an internal support structure to help some elements of clay sculptures hold their shape while they are still soft. Nichrome wire is used for its ability to withstand the high temperatures that occur when clay work is fired in a kiln.

Nichrome wire can be used as an alternative to platinum wire for flame testing by colouring the non-luminous part of a flame to detect cations such as sodium, potassium, copper, calcium etc.

The alloy tends to be expensive due to its high nickel content. Distributor pricing is typically indexed to market prices for nickel.

For heating, resistance wire must be stable in air when hot. Nichrome wire forms a protective layer of chromium oxide.

Nichrome may be also used as the coils of electronic cigarettes for vaping.

The table below shows approximate current (in amperes) necessary to produce a given temperature. Applying only to straight wires stretched horizontally in free air. Values for diameters from 1.016mm through to 0.254mm are based on coiling on an arbor 3.043mm diameter and stretched to twice the close-wound lengths.

Wire Gauge (B&S No. / AWG)	Diam. (inches/mm)		400 °F 204 °C	600 °F 316 °C	800 °F 427 °C	1000 °F 538 °C	1200 °F 649 °C	1400 °F 760 °C	1600 °F 871 °C	1800 °F 982 °C	2000 °F 1093 °C
12	0.081	2.057	11.34	15.91	20.27	25.53	31.77	39.03	46.73	54.80	63.01
13	0.072	1.829	9.73	13.53	17.21	21.61	26.89	33.06	39.60	46.41	53.31
14	0.064	1.626	8.34	10.50	14.59	18.30	22.76	28.01	33.56	39.31	45.11
15	0.057	1.448	7.15	9.78	12.38	15.50	19.26	23.73	28.44	33.30	38.17
16	0.051	1.296	6.13	8.31	10.50	13.11	16.30	20.10	24.10	28.20	32.30
17	0.045	1.143	5.31	7.18	9.13	11.30	13.90	16.90	20.30	23.60	27.00
18	0.040	1.016	4.66	6.26	7.90	9.75	11.96	14.51	17.37	20.48	23.08
19	0.036	0.914	4.09	5.46	6.84	8.41	10.30	12.45	14.87	17.78	19.73
20	0.032	0.813	3.58	4.77	5.92	7.25	8.86	10.69	12.72	15.43	16.87
21	0.0285	0.7239	3.14	4.16	5.13	6.26	7.63	9.17	10.88	13.40	14.40
22	0.0253	0.6426	2.76	3.63	4.44	5.40	6.56	7.87	9.31	11.63	12.33
23	0.0226	0.5740	2.42	3.16	3.84	4.67	5.65	6.76	7.97	10.09	10.54
24	0.020	0.508	2.12	2.76	3.32	4.01	4.86	5.80	6.82	8.76	9.01
25	0.0179	0.4547	1.84	2.42	2.90	3.44	4.15	4.97	5.86	6.96	7.72
26	0.0159	0.4039	1.58	2.09	2.52	3.00	3.61	4.31	5.06	5.97	6.63
27	0.0142	0.3607	1.34	1.80	2.19	2.62	3.14	3.73	4.37	5.12	5.69
28	0.0126	0.3200	1.18	1.55	1.90	2.28	2.73	3.23	3.77	4.39	4.88
29	0.0113	0.2870	1.02	1.34	1.65	1.99	2.37	2.80	3.25	3.76	4.39
30	0.010	0.254	0.875	1.16	1.43	1.74	2.06	2.43	2.81	3.22	3.59