

Electric Resistance Materials Table of Resistance value

Copper Nickel Electric Resistance Wire (CN49W, CN30W, CN15W, CN10W, CN5W)

Table 11 Diameter and Tolerance of Resistance Values

Diameter mm	Diameter Tolerance mm	CN49W Ω/m	CN30W Ω/m	CN15W Ω/m	CN10W Ω/m	CN5W Ω/m	Tolerance of Resistance Value %
0.040	±0.003	390	239	119	79.6	39.8	±12
0.050	±0.003	250	153	76.4	50.9	25.5	±11
0.060	±0.003	173	106	53.1	35.4	17.7	±11
0.070	±0.004	127	78.0	39.0	26.0	13.0	±10
0.080	±0.005	97.5	59.7	29.8	19.9	9.95	±10
0.090	±0.005	77.0	47.2	23.6	15.7	7.86	±10
0.100	±0.006	62.4	38.2	19.1	12.7	6.37	±9
0.110	±0.006	51.6	31.6	15.8	10.5	5.26	±9
0.120	±0.006	43.3	26.5	13.3	8.84	4.42	±9
0.130	±0.006	36.9	22.6	11.3	7.53	3.77	±9
0.140	±0.006	31.8	19.5	9.74	6.50	3.25	±8
0.150	±0.006	27.7	17.0	8.49	5.66	2.83	±8
0.160	±0.006	24.4	14.9	7.46	4.97	2.49	±8
0.170	±0.006	21.6	13.2	6.61	4.41	2.20	±8
0.180	±0.008	19.3	11.8	5.89	3.93	1.96	±8
0.190	±0.008	17.3	10.6	5.29	3.53	1.76	±8
0.200	±0.010	15.6	9.55	4.77	3.18	1.59	±8
0.230	±0.010	11.8	7.22	3.61	2.41	1.20	±8
0.250	±0.010	9.98	6.11	3.06	2.04	1.02	±8
0.260	±0.010	9.23	5.65	2.83	1.88	0.942	±8
0.290	±0.013	7.42	4.54	2.27	1.51	0.757	±7
0.300	±0.013	6.93	4.24	2.12	1.41	0.707	±7
0.320	±0.013	6.09	3.73	1.87	1.24	0.622	±7
0.350	±0.013	5.09	3.12	1.56	1.04	0.520	±7
0.400	±0.016	3.90	2.39	1.19	0.796	0.398	±7
0.450	±0.016	3.08	1.89	0.943	0.629	0.314	±7
0.500	±0.016	2.50	1.53	0.764	0.509	0.255	±7
0.550	±0.016	2.06	1.26	0.631	0.421	0.210	±7
0.600	±0.016	1.73	1.06	0.531	0.354	0.177	±6
0.650	±0.020	1.48	0.904	0.452	0.301	0.151	±6
0.700	±0.020	1.27	0.780	0.390	0.260	0.130	±6
0.750	±0.020	1.11	0.679	0.340	0.226	0.113	±6
0.800	±0.020	0.975	0.597	0.298	0.199	0.0995	±6
0.850	±0.020	0.864	0.529	0.264	0.176	0.0881	±6
0.900	±0.025	0.770	0.472	0.236	0.157	0.0786	±6
0.950	±0.025	0.691	0.423	0.212	0.141	0.0705	±6

Diameter mm	Diameter Tolerance mm	CN49W Ω/m	CN30W Ω/m	CN15W Ω/m	CN10W Ω/m	CN5W Ω/m	Tolerance of Resistance Value %
1.00	± 0.025	0.624	0.382	0.191	0.127	0.0637	± 6
1.10	± 0.025	0.516	0.316	0.158	0.105	0.0526	± 6
1.20	± 0.025	0.433	0.265	0.133	0.0884	0.0442	± 6
1.30	± 0.032	0.369	0.226	0.113	0.0753	0.0377	± 5
1.40	± 0.032	0.318	0.195	0.0974	0.0650	0.0325	± 5
1.50	± 0.032	0.277	0.170	0.0849	0.0566	0.0283	± 5
1.60	± 0.032	0.244	0.149	0.0746	0.0497	0.0249	± 5
1.70	± 0.032	0.216	0.132	0.0661	0.0441	0.0220	± 5
1.80	± 0.040	0.193	0.118	0.0589	0.0393	0.0196	± 5
1.90	± 0.040	0.173	0.106	0.0529	0.0353	0.0176	± 5
2.00	± 0.040	0.156	0.0955	0.0477	0.0318	0.0159	± 5
2.30	± 0.040	0.118	0.0722	0.0361	0.0241	0.0120	± 5
2.60	± 0.040	0.0923	0.0565	0.0283	0.0188	0.00942	± 5
2.90	± 0.050	0.0742	0.0454	0.0227	0.0151	0.00757	± 5
3.00	± 0.050	0.0693	0.0424	0.0212	0.0141	0.00707	± 5
3.20	± 0.050	0.0609	0.0373	0.0187	0.0124	0.00622	± 5
3.50	± 0.050	0.0509	0.0312	0.0156	0.0104	0.00520	± 5
4.00	± 0.063	0.0390	0.0239	0.0119	0.00796	0.00398	± 5
4.50	± 0.063	0.0308	0.0189	0.00943	0.00629	0.00314	± 5
5.00	± 0.063	0.0250	0.0153	0.00764	0.00509	0.00255	± 5
5.50	± 0.063	0.0206	0.0126	0.00631	0.00421	0.00210	± 5
6.00	± 0.080	0.0173	0.0106	0.00531	0.00354	0.00177	± 5
6.50	± 0.080	0.0148	0.00904	0.00452	0.00301	0.00151	± 5
7.00	± 0.080	0.0127	0.00780	0.00390	0.00260	0.00130	± 5
7.50	± 0.080	0.0111	0.00679	0.00340	0.00226	0.00113	± 5
8.00	± 0.090	0.00975	0.00597	0.00298	0.00199	0.000995	± 5
8.50	± 0.090	0.00864	0.00529	0.00264	0.00176	0.000881	± 5
9.00	± 0.100	0.00770	0.00472	0.00236	0.00157	0.000786	± 5

Precision Resistance Wire of Manganin (CMW) and Karmalloy (KMW)

Table 12

Diameter mm	Manganin Wire CMW			Karmalloy Wire KMW		
	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %
0.015					7526	± 10
0.020					4234	± 10
0.025					2709	± 10
0.030					1882	± 10
0.040	± 0.003	350	± 12	± 0.003	1058	± 10
0.050	± 0.004	224	± 11	± 0.003	677	± 10
0.060	± 0.004	156	± 11	± 0.004	470	± 8
0.070	± 0.005	114	± 10	± 0.005	346	± 8
0.080	± 0.005	87.5	± 10	± 0.006	265	± 8
0.090	± 0.005	69.2	± 10	± 0.006	209	± 8

Diameter mm	Manganin Wire CMW			Karmalloy Wire KMW		
	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %
0.100	± 0.006	56.0	± 9	± 0.006	169	± 8
0.110	± 0.006	46.3	± 9	± 0.006	140	± 8
0.120	± 0.006	38.9	± 9	± 0.008	118	± 8
0.130	± 0.006	33.1	± 9	± 0.008	100	± 8
0.140	± 0.008	28.6	± 8	± 0.008	86.4	± 5
0.150	± 0.008	24.9	± 8	± 0.008	75.3	± 5
0.160	± 0.008	21.9	± 8	± 0.008	66.1	± 5
0.170	± 0.008	19.4	± 8	± 0.008	58.6	± 5
0.180	± 0.008	17.3	± 8	± 0.010	52.3	± 5
0.190	± 0.008	15.5	± 8	± 0.010	46.9	± 5
0.200	± 0.010	14.0	± 8	± 0.010	42.3	± 5
0.230	± 0.010	10.6	± 8	± 0.010	32.0	± 5
0.250	± 0.010	8.96	± 8	± 0.012	27.1	± 5
0.260	± 0.010	8.29	± 8	± 0.012	25.1	± 5
0.290	± 0.013	6.66	± 7	± 0.012	20.1	± 5
0.300	± 0.013	6.22	± 7	± 0.012	18.8	± 5
0.320	± 0.013	5.47	± 7	± 0.015	16.5	± 5
0.350	± 0.013	4.57	± 7	± 0.015	13.8	± 5
0.400	± 0.015	3.50	± 7	± 0.015	10.6	± 5
0.450	± 0.015	2.77	± 7	± 0.015	8.36	± 5
0.500	± 0.015	2.24	± 7	± 0.020	6.77	± 5
0.550	± 0.020	1.85	± 7	± 0.020	5.60	± 5
0.600	± 0.020	1.56	± 6	± 0.020	4.70	± 5
0.650	± 0.020	1.33	± 6	± 0.020	4.01	± 5
0.700	± 0.020	1.14	± 6	± 0.020	3.46	± 5
0.750	± 0.020	0.996	± 6	± 0.025	3.01	± 5
0.800	± 0.020	0.875	± 6	± 0.025	2.65	± 5
0.850	± 0.025	0.775	± 6	± 0.025	2.34	± 5
0.900	± 0.025	0.692	± 6	± 0.025	2.09	± 5
0.950	± 0.025	0.621	± 6	± 0.025	1.88	± 5
1.00	± 0.025	0.560	± 6	± 0.025	1.69	± 5
1.10	± 0.025	0.463	± 6			
1.20	± 0.025	0.389	± 6			
1.30	± 0.032	0.331	± 5			
1.40	± 0.032	0.286	± 5			
1.50	± 0.032	0.249	± 5			
1.60	± 0.032	0.219	± 5			
1.70	± 0.032	0.194	± 5			
1.80	± 0.040	0.173	± 5			
1.90	± 0.040	0.155	± 5			
2.00	± 0.040	0.140	± 5			
2.30	± 0.040	0.106	± 5			
2.60	± 0.040	0.0829	± 5			
2.90	± 0.050	0.0666	± 5			

Diameter mm	Manganin Wire CMW			Karmalloy Wire KMW		
	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %	Diameter Tolerance mm	Resistance Value Ω/m	Tolerance of Resistance Value %
3.00	± 0.050	0.0622	± 5			
3.20	± 0.050	0.0547	± 5			
3.50	± 0.050	0.0457	± 5			
4.00	± 0.063	0.0350	± 5			
4.50	± 0.063	0.0277	± 5			
5.00	± 0.063	0.0224	± 5			
5.50	± 0.063	0.0185	± 5			
6.00	± 0.080	0.0156	± 5			
6.50	± 0.080	0.0133	± 5			

Nickel-Chrome Electric Resistance Wire Class 1, Class 2 (NCHW-1, NCHW-2)
Iron-Chrome Electric Resistance Wire, Class 1, Class 2 (FCHW-1, FCHW-2)

Table 13

Diameter mm	Diameter Tolerance mm	NCHW-1 Ω/m	NCHW-2 Ω/m	FCHW-1 Ω/m	FCHW-2 Ω/m	Tolerance of Resistance Value %
0.040	± 0.004	859	891			± 13
0.050	± 0.004	550	570			± 12
0.060	± 0.004	382	396			± 11
0.070	± 0.005	281	291			± 11
0.080	± 0.005	215	223			± 10
0.090	± 0.005	170	176			± 10
0.100	± 0.006	138	143	181	157	± 9
0.110	± 0.006	114	118	149	129	± 9
0.120	± 0.006	95.5	99.0	126	109	± 9
0.130	± 0.006	81.4	84.4	107	92.7	± 9
0.140	± 0.008	70.2	72.8	92.2	79.9	± 8
0.150	± 0.008	61.1	63.4	80.4	69.6	± 8
0.160	± 0.008	53.7	55.7	70.6	61.2	± 8
0.170	± 0.008	47.6	49.3	62.6	54.2	± 8
0.180	± 0.008	42.4	44.0	55.8	48.3	± 8
0.190	± 0.008	38.1	39.5	50.1	43.4	± 8
0.200	± 0.010	34.4	35.7	45.2	39.2	± 8
0.230	± 0.010	26.0	27.0	34.2	29.6	± 8
0.250	± 0.010	22.0	22.8	28.9	25.1	± 8
0.260	± 0.010	20.3	21.1	26.7	23.2	± 8
0.290	± 0.013	16.4	17.0	21.5	18.6	± 7
0.300	± 0.013	15.3	15.8	20.1	17.4	± 7
0.320	± 0.013	13.4	13.9	17.7	15.3	± 7
0.350	± 0.013	11.2	11.6	14.8	12.8	± 7
0.400	± 0.016	8.59	8.91	11.3	9.79	± 7
0.450	± 0.016	6.79	7.04	8.93	7.73	± 7
0.500	± 0.016	5.50	5.70	7.23	6.26	± 7

Diameter mm	Diameter Tolerance mm	NCHW-1 Ω/m	NCHW-2 Ω/m	FCHW-1 Ω/m	FCHW-2 Ω/m	Tolerance of Resistance Value %
0.550	±0.016	4.55	4.71	5.98	5.18	±7
0.600	±0.016	3.82	3.96	5.02	4.35	±6
0.650	±0.020	3.25	3.38	4.28	3.71	±6
0.700	±0.020	2.81	2.91	3.69	3.20	±6
0.750	±0.020	2.44	2.54	3.21	2.78	±6
0.800	±0.020	2.15	2.23	2.83	2.45	±6
0.850	±0.020	1.90	1.97	2.50	2.17	±6
0.900	±0.025	1.70	1.76	2.23	1.93	±6
0.950	±0.025	1.52	1.58	2.00	1.74	±6
1.00	±0.025	1.38	1.43	1.81	1.57	±6
1.10	±0.025	1.14	1.18	1.49	1.29	±6
1.20	±0.025	0.955	0.990	1.26	1.09	±6
1.30	±0.032	0.814	0.844	1.07	0.927	±5
1.40	±0.032	0.702	0.728	0.922	0.799	±5
1.50	±0.032	0.611	0.634	0.804	0.696	±5
1.60	±0.032	0.537	0.557	0.706	0.612	±5
1.70	±0.032	0.476	0.493	0.626	0.542	±5
1.80	±0.040	0.424	0.440	0.558	0.483	±5
1.90	±0.040	0.381	0.395	0.501	0.434	±5
2.00	±0.040	0.344	0.357	0.452	0.392	±5
2.30	±0.040	0.260	0.270	0.342	0.296	±5
2.60	±0.040	0.203	0.211	0.267	0.232	±5
2.90	±0.050	0.164	0.170	0.215	0.186	±5
3.00	±0.050	0.153	0.158	0.201	0.174	±5
3.20	±0.050	0.134	0.139	0.177	0.153	±5
3.50	±0.050	0.112	0.116	0.148	0.128	±5
4.00	±0.063	0.0859	0.0891	0.113	0.0979	±5
4.50	±0.063	0.0679	0.0704	0.0893	0.0773	±5
5.00	±0.063	0.0550	0.0570	0.0723	0.0626	±5
5.50	±0.063	0.0455	0.0471	0.0598	0.0518	±5
6.00	±0.080	0.0382	0.0396	0.0502	0.0435	±5
6.50	±0.080	0.0325	0.0338	0.0428	0.0371	±5
7.00	±0.080	0.0281	0.0291	0.0369	0.0320	±5
7.50	±0.080	0.0244	0.0254	0.0321	0.0278	±5
8.00	±0.080	0.0215	0.0223	0.0283	0.0245	±5
8.50	±0.080	0.0190	0.0197	0.0250	0.0217	±5
9.00	±0.100	0.0170	0.0176	0.0223	0.0193	±5