Technical Datasheet

CarTech® TOPHET® Alloy A

Type Analysis

Single figures are nominal except where noted.

Chromium	20.00 %	**Nickel**	80.00 %

General Information

Description

CarTech Tophet alloy A, an 80% nickel 20% chromium alloy, has for half a century been satisfactorily used at temperatures up to 2150°F (1175°C).

Quality manufacturers of electric furnaces, appliances, and other resistance heating applications specify CarTech Tophet alloy A with confidence. Resistance to most acids and alkaline solutions make CarTech Tophet alloy A valuable to chemical industries where it has found wide use in baskets, belts, and other hardware.

CarTech Tophet alloy A is the most resistant of all the CarTech Tophet alloys in a carburizing atmosphere.

CarTech Tophet alloy A, having the advantages of being nonmagnetic and having high resistivity (650 ohms cm/f) has been used in wire-wound resistors in ultrafine sizes. The temperature coefficient for resistance (TCR) for standard CarTech Tophet alloy A in the range of 25/250°C is 0.000085 ohms/ohm/°C (85 parts per million).

Corrosion Resistance

Important Note: *The following 4-level rating scale is intended for comparative purposes only. Corrosion testing is recommended; factors which affect corrosion resistance include temperature, concentration, pH, impurities, aeration, velocity, crevices, deposits, metallurgical condition, stress, surface finish and dissimilar metal contact.*

Nitric Acid	Good	Sulfuric Acid	Good
Phosphoric Acid	Good	Acetic Acid	Good
Sodium Hydroxide	Good	Salt Spray (NaCl)	Excellent
Sea Water	Moderate	Humidity	Excellent

Properties

Physical Properties

Specific Gravity	8.41	
Density	0.3039	lb/in³
Electrical Resistivity (70°F)	650.0	ohm-cir-mil/ft
Temperature Coeff of Electrical Resist (77 to 221°F)	0.472	x 10 $^{-4}$ Ohm/Ohm/°F
Melting Range	2550	°F
Thermal EMF (vs. Platinum 67, 32 to 212°F)	7.2E-3	mV/°F

Other Information

Applicable Specifications

TOPHET alloy A conforms to ASTM specifications B-344 and B-267

• ASTM B267 Class 3A

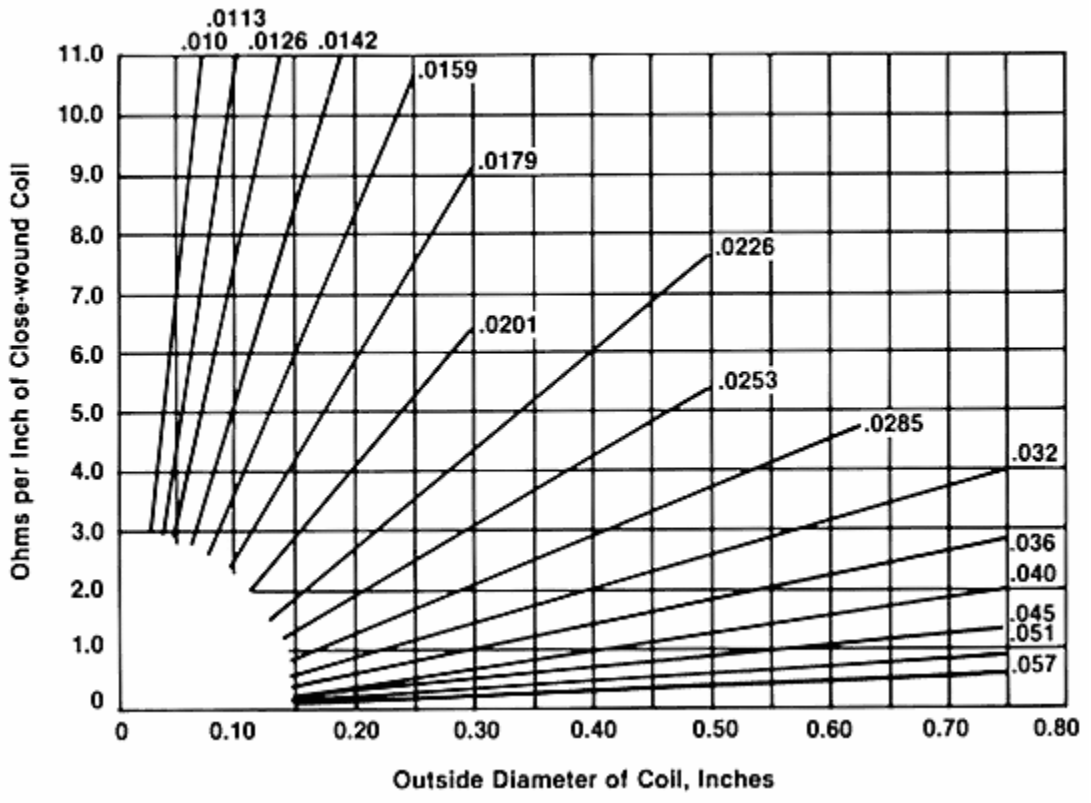
Forms Manufactured

• Ribbon
• Wire

Chart shows amperes necessary to raise to a given temperature, a straight ribbon in air.

Size		100 212	200 392	300 572	400 752	500 932	600°C 1112°F
1/64"	.010	.660	1.16	1.56	2.00	2.36	2.72
1/64"	.0089	.634	1.11	1.49	1.90	2.26	2.60
1/64"	.008	.585	1.02	1.38	1.72	2.08	2.38
1/64"	.0071	.545	.955	1.28	1.59	1.92	2.18
1/64"	.0063	.510	.900	1.21	1.50	1.82	2.07
1/64"	.0056	.484	.850	1.15	1.43	1.73	1.97
1/64"	.005	.460	.803	1.09	1.36	1.64	1.88
1/64"	.0045	.437	.762	1.04	1.30	1.56	1.79
1/64"	.004	.413	.720	.983	1.22	1.48	1.70
1/64"	.0035	.388	.673	.924	1.15	1.38	1.59
1/64"	.0031	.366	.632	.870	1.08	1.30	1.52
1/32"	.010	1.09	1.91	2.60	3.32	3.97	4.60
1/32"	.0089	.995	1.73	2.34	3.02	3.58	4.16
1/32"	.008	.905	1.58	2.12	2.75	3.28	3.80
1/32"	.0071	.820	1.45	1.94	2.52	2.99	3.48
1/32"	.0063	.754	1.32	1.77	2.31	2.71	3.15
1/32"	.0056	.708	1.24	1.66	2.15	2.53	2.93
1/32"	.005	.660	1.16	1.56	2.00	2.36	2.72
1/32"	.0045	.634	1.11	1.49	1.90	2.26	2.60
1/32"	.004	.585	1.02	1.38	1.72	2.08	2.38
1/32"	.0035	.545	.955	1.28	1.59	1.92	2.18
1/32"	.0031	.510	.900	1.21	1.50	1.82	2.07
1/16"	.010	1.58	2.72	3.75	4.70	5.65	6.55
1/16"	.0089	1.46	2.53	3.49	4.38	5.28	6.06
1/16"	.008	1.37	2.37	3.24	4.10	4.92	5.65
1/16"	.0071	1.27	2.20	3.00	3.83	4.58	5.25
1/16"	.0063	1.17	2.03	2.77	3.55	4.23	4.88
1/16"	.0056	1.08	1.90	2.57	3.30	3.92	4.52
1/16"	.005	1.00	1.76	2.37	3.07	3.63	4.21
1/16"	.0045	.950	1.65	2.21	2.88	3.42	3.94
1/16"	.004	.876	1.53	2.05	2.68	3.14	3.67
1/16"	.0035	.815	1.42	1.83	2.40	2.80	3.26
1/16"	.0031	.750	1.32	1.75	2.29	2.69	3.12
3/32"	.010	2.20	3.84	5.24	6.50	8.03	9.36
3/32"	.0089	2.04	3.56	4.85	6.06	7.45	8.70
3/32"	.008	1.92	3.33	4.56	5.70	6.95	8.12
3/32"	.0071	1.78	3.10	4.20	5.28	6.45	7.54
3/32"	.0063	1.65	2.88	3.92	4.92	6.00	7.00
3/32"	.0056	1.53	2.68	3.64	4.58	5.58	6.50
3/32"	.005	1.43	2.49	3.38	4.28	5.18	6.06
3/32"	.0045	1.34	2.34	3.17	4.02	4.85	5.68
3/32"	.004	1.24	2.16	2.95	3.74	4.50	5.28
3/32"	.0035	1.14	2.00	2.72	3.46	4.12	4.80
3/32"	.0031	1.02	1.80	2.43	3.12	3.72	4.32
1/8"	.010	2.89	5.00	6.90	8.55	10.30	12.00
1/8"	.0089	2.67	4.67	6.40	7.95	9.60	11.10
1/8"	.008	2.50	4.35	5.95	7.42	9.00	10.30
1/8"	.0071	2.33	4.02	5.54	6.90	8.37	9.68
1/8"	.0063	2.16	3.74	5.14	6.40	7.72	8.98
1/8"	.0056	2.00	3.46	4.76	5.95	7.20	8.35
1/8"	.005	1.86	2.23	4.44	5.53	6.68	7.74
1/8"	.0045	1.74	3.01	4.14	5.19	6.25	7.25
1/8"	.004	1.62	2.80	3.85	4.80	5.80	6.75
1/8"	.0035	1.49	2.57	3.52	4.40	5.32	6.13
1/8"	.0031	1.33	2.30	3.16	3.98	4.80	5.60
3/16"	.010	4.22	7.22	10.00	12.60	15.10	17.40
3/16"	.0089	3.90	6.72	9.22	11.70	14.00	16.10
3/16"	.008	3.66	6.30	8.60	10.80	13.10	15.00
3/16"	.0071	3.39	5.80	8.00	10.00	12.20	14.00
3/16"	.0063	3.15	5.40	7.40	9.35	11.30	12.90
3/16"	.0056	2.92	5.00	6.87	8.65	10.40	12.10
3/16"	.005	2.71	4.65	6.38	8.02	9.70	11.30
3/16"	.0045	2.53	4.34	6.00	7.50	9.05	10.50
3/16"	.004	2.34	4.02	5.55	6.95	8.40	9.80
3/16"	.0035	2.14	3.67	5.07	6.34	7.68	9.00
3/16"	.0031	1.98	3.40	4.70	5.85	7.10	8.35

Coil O.D. vs. Resistance/Inch for Various Wire Sizes



Current Temperature Characteristics of Coiled Wire

Chart shows amperes necessary to raise to a given temperature in air, a coil of stated arbor size when stretched twice the close-wound length.

B&S	Dia. in Inches	Arbor Size	200 392	300 572	400 572	500 932	600 1112	700 1292	800 1472	900 1652	1000 1832	1100°C 2012°F
11	.091	3/16	8.60	12.1	16.8	21.8	26.8	32.6	38.8	44.8	52.0	59.8
12	.081	3/16	7.35	10.5	14.0	17.8	22.9	27.3	33.1	38.0	44.2	50.3
13	.072	3/16	6.20	8.82	11.7	15.2	18.9	23.1	27.8	31.8	36.7	42.5
14	.064	3/16	5.20	7.45	10.1	12.8	16.0	19.6	23.2	26.6	31.0	35.7
15	.057	3/16	4.30	6.30	8.4	10.7	13.6	16.3	19.4	22.4	25.9	29.4
16	.051	3/16	3.62	5.25	6.80	9.02	11.3	13.7	16.4	18.9	22.0	25.2
17	.045	3/16	3.00	4.30	5.80	7.56	9.45	11.3	13.6	15.8	18.4	21.0
18	.040	1/8	2.47	3.47	4.72	6.10	7.77	9.45	11.3	13.3	15.7	17.5
19	.036	1/8	2.04	2.94	3.88	5.15	6.50	7.97	9.66	11.3	13.4	14.7
20	.032	1/8	1.68	2.42	3.26	4.30	5.46	6.72	8.20	9.65	11.3	12.6
21	.0285	1/8	1.42	1.99	2.73	3.57	4.62	5.67	6.82	7.97	9.45	10.5
22	.0253	1/8	1.18	1.68	2.31	3.04	3.88	4.72	5.77	6.72	7.97	8.92
23	.0226	1/8	1.01	1.37	1.89	2.52	3.26	4.00	4.83	5.77	6.72	7.45
24	.0201	1/8	.82	1.16	1.57	2.10	2.73	3.36	4.10	4.82	5.67	6.30
25	.0179	1/8	.68	1.02	1.37	1.78	2.31	2.83	3.47	4.10	4.72	5.35
26	.0159	1/8	.57	.840	1.16	1.47	1.89	2.42	2.94	3.47	3.99	4.52
27	.0142	1/8	.47	.692	.970	1.26	1.58	2.00	2.41	2.84	3.36	3.78
28	.0126	1/8	.40	.588	.800	1.05	1.36	1.68	1.99	2.31	2.73	3.15
29	.0113	1/8	.34	.484	.670	.882	1.15	1.37	1.68	1.99	2.31	2.62
30	.010	1/8	.27	.400	.557	.736	.945	1.16	1.37	1.68	1.99	2.20
31	.0089	1/16	.210	.315	.442	.597	.767	.945	1.16	1.37	1.68	1.89
32	.008	1/16	.168	.252	.356	.482	.632	.797	.966	1.16	1.36	1.58
33	.0071	1/16	.137	.200	.294	.388	.515	.650	.800	.945	1.15	1.26
34	.0063	1/16	.104	.158	.231	.315	.420	.525	.661	.776	.922	1.05
35	.0056	1/16	.074	.126	.189	.262	.336	.441	.546	.650	.767	.892
36	.005	1/32	.067	.105	.158	.210	.284	.367	.452	.535	.640	.735
37	.0045	1/32	.056	.088	.126	.178	.231	.294	.378	.431	.525	.608
38	.004	1/32	.046	.073	.105	.147	.200	.252	.317	.367	.441	.504
39	.0035	1/32	.039	.062	.088	.126	.158	.210	.262	.306	.367	.420
40	.0031	1/32	.033	.052	.073	.105	.137	.168	.220	.253	.305	.347

Current Temperature Characteristics of Straight Wire

Chart shows amperes necessary to raise to a given temperature a straight horizontal wire in air.

B&S	Dia. in Inches	200 392	300 572	400 752	500 932	600 1112	700 1292	800 1472	900 1652	1000 1832	1100°C 2012°F
1	.289	76.0	103.0	131.0	161.0	198.0	238.0	285.0	335.0	384.0	435.0
2	.258	63.0	87.0	110.0	135.0	166.0	200.0	240.0	281.0	325.0	367.0
3	.229	52.0	73.0	92.0	115.0	139.0	169.0	202.0	238.0	270.0	307.0
4	.204	44.0	61.7	77.0	96.0	117.6	142.0	166.0	198.0	228.0	256.0
5	.182	37.4	51.8	65.5	81.3	98.0	118.0	141.0	166.5	190.0	218.0
6	.162	31.0	42.7	54.5	67.5	81.5	99.7	118.0	139.4	160.0	184.0
7	.144	26.0	36.3	46.0	57.0	69.0	83.5	99.0	116.0	135.0	152.0
8	.128	22.0	30.5	38.7	46.5	58.5	71.0	82.5	96.5	113.0	127.5
9	.114	18.7	26.0	33.0	40.0	49.7	59.7	71.0	82.1	95.7	108.0
10	.102	16.3	22.1	28.2	34.0	41.5	50.0	59.5	70.1	81.5	91.5
11	.091	13.9	18.5	23.2	28.5	34.0	42.6	50.2	59.6	68.4	77.5
12	.081	12.1	15.8	19.8	24.2	29.6	34.8	42.7	49.5	57.5	66.0
13	.072	10.3	13.5	17.0	20.6	24.0	29.6	34.8	41.0	45.5	53.0
14	.064	9.	11.7	14.8	17.6	21.0	25.2	29.7	34.8	38.0	45.0
15	.057	8.0	10.0	12.8	15.1	18.3	21.5	25.3	29.6	34.3	38.2
16	.051	7.00	8.80	11.00	12.90	15.60	18.30	21.6	25.0	29.2	33.8
17	.045	6.10	7.58	9.37	11.20	13.30	15.60	18.4	21.5	24.9	27.7
18	.040	5.25	6.46	7.99	9.50	11.30	13.30	15.7	18.3	21.2	23.6
19	.036	4.50	5.51	6.80	8.10	9.63	11.38	13.4	15.6	18.1	20.4
20	.032	3.85	4.70	5.80	6.90	8.20	9.70	11.4	13.3	15.4	17.4
21	.0285	3.30	4.05	4.95	5.90	7.10	8.30	9.85	11.20	13.10	14.80
22	.0253	2.85	3.55	4.25	5.10	6.00	7.30	8.40	9.60	11.15	12.60
23	.0226	2.45	3.10	3.70	4.45	5.10	6.30	7.30	8.45	9.70	10.90
24	.0201	2.16	2.75	3.40	3.90	4.60	5.40	6.35	7.25	8.30	9.40
25	.0179	1.85	2.35	2.90	3.40	4.00	4.65	5.45	6.30	7.15	8.05
26	.0159	1.61	2.00	2.48	2.90	3.40	3.95	4.65	5.40	6.10	6.90
27	.0142	1.39	1.75	2.13	2.55	2.95	3.52	4.05	4.70	5.30	5.95
28	.0126	1.21	1.53	1.84	2.18	2.60	3.04	3.55	4.06	4.55	5.10
29	.0113	1.08	1.35	1.62	1.95	2.30	2.65	3.12	3.45	3.99	4.45
30	.010	.90	1.15	1.40	1.67	1.97	2.28	2.67	2.96	3.42	3.80
31	.0089	.77	.99	1.22	1.40	1.68	1.97	2.28	2.55	2.92	3.24
32	.008	.66	.86	1.05	1.22	1.42	1.69	1.95	2.22	2.51	2.77
33	.0071	.58	.73	.92	1.05	1.22	1.42	1.66	1.85	2.14	2.37
34	.0063	.50	.63	.79	.92	1.06	1.23	1.42	1.60	1.83	2.02
35	.0056	.43	.54	.68	.80	.92	1.07	1.25	1.37	1.57	1.73
36	.005	.37	.49	.59	.70	.80	.95	1.08	1.20	1.34	1.48
37	.0045	.32	.43	.52	.62	.70	.83	.93	1.05	1.17	1.27
38	.004	.28	.38	.45	.52	.60	.71	.81	.90	1.00	1.09
39	.0035	.25	.34	.39	.45	.52	.61	.69	.77	.86	.93
40	.0031	.22	.29	.34	.39	.45	.52	.59	.65	.73	.79

Resistivity equals 650 ohms per circular mil foot at 77°F (25°C)

Factors for Determining Resistance at Various Temperatures

Temperature °F	77	212	392	572	752	932	1112	1292	1472	1652	1832	2012
Temperature °C	25	100	200	300	400	500	600	700	800	900	1000	1100
Factor	1.000	1.017	1.035	1.052	1.062	1.068	1.066	1.063	1.062	1.067	1.071	1.075

These figures will vary slightly with various sizes of wire due to rate of cooling.

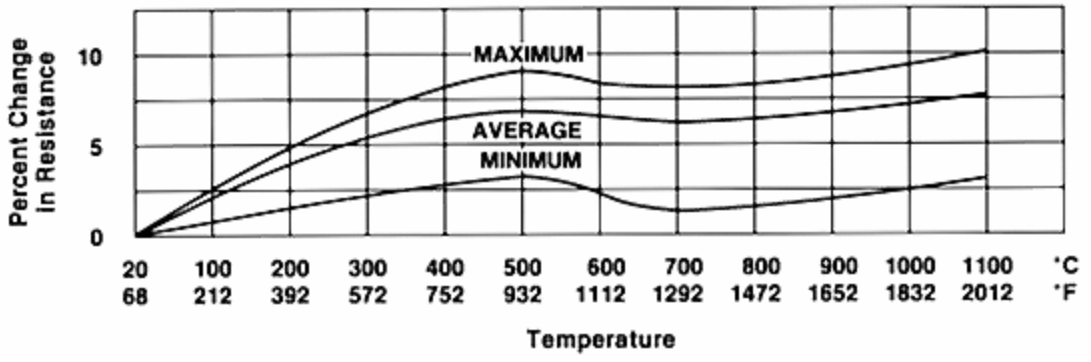
B&S	Dia. in Inches	Ohms per Foot at 77°F (25°C)	Ohms per Pound Bare Wire	Square Inches per Ohm	Feet per Pound Bare Wire	Pounds per M Feet
000	.410	.003867	.008031	3997	2.077	481.5
00	.365	.004879	.01279	2820	2.621	381.6
0	.325	.006154	.02034	1991	3.305	302.5
1	.289	.007782	.03253	1400	4.18	239.2
2	.258	.009765	.05122	996	5.245	190.7
3	.229	.01239	.08252	696.5	6.658	150.2
4	.204	.01562	.1310	492.4	8.39	119.2
5	.182	.01962	.2068	349.6	10.54	94.87
6	.162	.02477	.3295	246.6	13.3	75.17
7	.144	.03135	.5278	173.2	16.84	59.39
8	.128	.03967	.8454	121.6	21.31	46.93
9	.114	.05002	1.344	85.93	26.87	37.22
10	.102	.06248	2.097	61.55	33.56	29.8
11	.091	.07849	3.309	43.71	42.16	23.72
12	.081	.09907	5.272	30.82	53.21	18.79
13	.072	.1254	8.445	21.65	67.35	14.85
14	.064	.1587	13.53	15.2	85.24	11.73
15	.057	.2001	21.5	10.74	107.5	9.306
16	.051	.2499	33.55	7.694	134.2	7.45
17	.045	.3210	55.34	5.285	172.4	5.8
18	.04	.4062	88.65	3.712	218.2	4.583
19	.036	.5015	135.1	2.706	269.4	3.712
20	.032	.6348	216.4	1.900	341	2.933
21	.0285	.8002	344	1.343	429.8	2.326
22	.0253	1.015	553.9	.9392	545.5	1.833
23	.0226	1.273	869.9	.6695	683.6	1.463
24	.0201	1.609	1390	.471	864.2	1.157
25	.0179	2.029	2211	.3326	1090	.9177
26	.0159	2.571	3551	.2331	1381	.7241
27	.0142	3.224	5582	.1661	1731	.5775
28	.0126	4.094	9004	.116	2199	.4547
29	.0113	5.090	13920	.08369	2734	.3657
30	.010	6.500	22690	.058	3491	.2864
31	.0089	8.206	36170	.04089	4408	.2269
32	.008	10.16	55410	.0297	5455	.1833
33	.0071	12.89	89310	.02076	6926	.1444
34	.0063	16.33	144100	.0145	8797	.1137
35	.0056	20.73	230800	.01019	11130	.08982
36	.005	26.00	363100	.00725	13970	.0716
37	.0045	32.10	553400	.005285	17240	.058
38	.004	40.63	886500	.003712	21820	.04583
39	.0035	53.06	1512000	.002487	28500	.03509
40	.0031	67.64	2457000	.001728	36330	.02752
41	.00275	85.95	3968000	.001206	46170	.02166
42	.0025	104.0	5810000	.00090620	55860	.0179
43	.00225	128.4	8855000	.00066060	68970	.0145
44	.002	162.5	14180000	.00046400	87230	.01146
45	.00175	212.2	24200000	.00031080	114000	.008772
46	.0015	288.9	44830000	.00019570	155200	.006444
47	.0014	331.6	59070000	.00015910	178100	.005614
48	.0013	384.6	79460000	.00012740	206600	.00484
49	.0012	451.4	109400000	.00010020	242500	.004124
50	.0011	537.2	155000000	.00007720	288500	.003466
51	.001	650	226900000	.00005800	349100	.002864
52	.0009	802.5	345900000	.00004228	431000	.00232
53	.0008	1016	554100000	.00002970	545500	.001833
54	.0007	1327	945200001	.00001989	712500	.001403

Feet per Pound of Ribbon (Flat Wire)

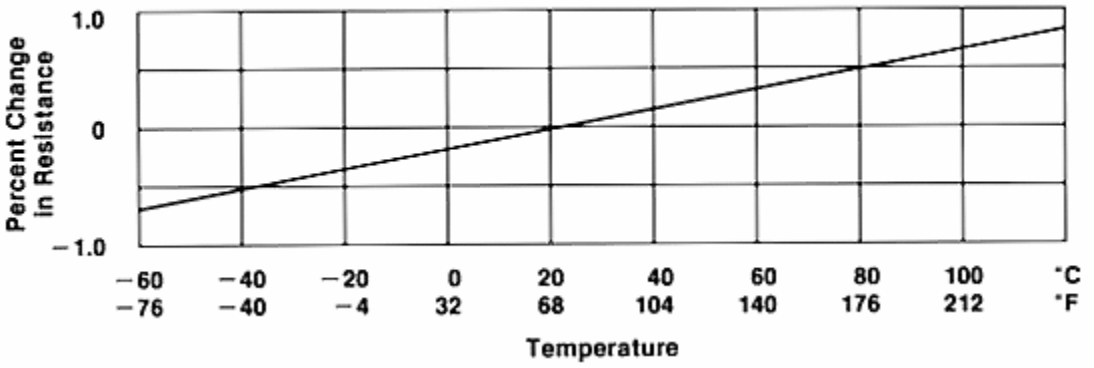
Density equals 0.3039 pounds per cubic inch

Thickness		Width in Inches								
B&S	Inches	1/64 .015625	1/32 .03125	3/64 .046875	1/16 .0625	3/32 .09375	1/8 .125	3/16 .1875	1/4 .250	3/8 .375
10	.102								11.440	7.169
11	.091								12.820	8.036
12	.081								14.410	9.028
13	.072								16.210	10.160
14	.064							24.310	18.230	11.430
15	.057							27.300	20.470	12.830
16	.051							30.510	22.880	14.340
17	.045							34.570	25.930	16.250
18	.040							38.900	29.170	18.280
19	.036							43.220	32.410	20.310
20	.032						72.93	48.620	36.460	22.850
21	.0285						81.89	54.590	40.940	25.660
22	.0253						92.24	61.490	46.120	28.900
23	.0226						103.30	64.710	48.530	32.360
24	.0201						116.10	72.760	54.570	36.380
25	.0179			347.70	260.80	173.80	130.40	81.700		
26	.0159			391.40	293.60	195.70	146.80	91.980		
27	.0142			438.30	328.70	219.10	164.30	103.000		
28	.0126			493.90	370.40	247.00	185.20	116.100		
29	.0113			550.70	413.00	275.40	206.50	129.400		
30	.0100	1867.00	933.50	622.30	466.70	311.20	233.40	146.200		
31	.0089	2098.00	1049.00	699.20	524.40	349.60	262.20	164.300		
32	.0080	2334.00	1167.00	777.90	583.40	389.00	330.40			
33	.0071	2630.00	1315.00	876.50	657.40	438.30	372.30			
34	.0063	2963.00	1482.00	987.80	740.90	493.90	419.50			
35	.0056	3334.00	1667.00	1111.00	833.50	629.30	472.00			
36	.0050	3734.00	1867.00	1245.00	933.50	704.80	528.60			
37	.0045	4149.00	2074.00	1383.00	1037.00	783.10	587.30			
38	.0040	4667.00	2334.00	1556.00	1322.00	881.00	660.80			
39	.0035	5334.00	2667.00	1778.00	1510.00	1007.00	755.10			
40	.0031	6023.00	3011.00	2274.00	1705.00	1137.00				

High Temperature Range



Low Temperature Range



Resistance of Ribbon (Flat Wire) in Ohms per Foot at 77°F (25°C)

Resistivity equals 510 ohms per square mil foot at 77°F (25°C)

Thickness		Width in Inches *								
B&S	Inches	1/64 .015625	1/32 .03125	3/64 .046875	1/16 .0625	3/32 .09375	1/8 .125	3/16 .1875	1/4 .250	3/8 .375
10	.102								.02128	.01333
11	.091								.02385	.01495
12	.081								.02679	.01679
13	.072								.03014	.01889
14	.064							.04521	.03391	.02125
15	.057							.05077	.03807	.02386
16	.051							.05674	.04255	.02667
17	.045							.06430	.04823	.03022
18	.040						.1085	.07234	.05426	.03400
19	.036						.1206	.08038	.06028	.03778
20	.032						.1356	.09043	.06782	.04250
21	.0285						.1523	.10150	.07615	.04772
22	.0253						.1716	.11440	.08578	.05375
23	.0226						.1921	.12040	.09027	.06018
24	.0201						.2159	.13530	.10150	.06766
25	.0179			.6466	.4850	.3233	.2425	.15200		
26	.0159			.7280	.5460	.3640	.2730	.17110		
27	.0142			.8151	.6113	.4076	.3057	.19150		
28	.0126			.9186	.6890	.4593	.3445	.21590		
29	.0113			1.0240	.7682	.5121	.3841	.24070		
30	.0100	3.4720	1.7360	1.1570	.8681	.5787	.4340	.27200		
31	.0089	3.9020	1.9510	1.3010	.9754	.6503	.4877	.30560		
32	.0080	4.3400	2.1700	1.4470	1.0850	.7234	.6145			
33	.0071	4.8910	2.4450	1.6300	1.2230	.8151	.6923			
34	.0063	5.5120	2.7560	1.8370	1.3780	.9186	.7803			
35	.0056	6.2010	3.1000	2.0670	1.5500	1.1700	.8778			
36	.0050	6.9450	3.4720	2.3150	1.7360	1.3110	.9831			
37	.0045	7.7160	3.8580	2.5720	1.9290	1.4560	1.0920			
38	.0040	8.6810	4.3400	2.8940	2.4580	1.6390	1.2290			
39	.0035	9.9210	4.9600	3.3070	2.8090	1.8730	1.4040			
40	.0031	11.2000	5.6010	4.2290	3.1710	2.1140				

*Historically, sizes to the right of the double line are considered square edge. Those to the left are considered round edge and resistances of these sizes are calculated according to the method advocated by the American Society for Testing Materials. That is, if the width to thickness ratio of a round edge strip is less than 15 to 1, the cross-sectional area shall be considered 6% less than a true rectangle when calculating the resistance. This is true of all sizes above the solid line.

For all sizes below the solid line, the width to thickness ratio is greater than 15 to 1 and the cross-sectional area shall be considered 17% less than a true rectangle.

Edition Date: 01/01/1988