Table 20.4 Continued

Conductor size	Nominal		Minimum[a]		Maximum[a]	
	inches	mm	inches (0.98 x nominal)	mm	inches (1.01 x nominal)	mm
22 AWG	0.0287	0.729	0.0281	0.714	0.0290	0.737
21	0.0323	0.820	0.0317	0.805	0.0326	0.828
20	0.0362	0.919	0.0355	0.902	0.0366	0.930
19	0.0407	1.03	0.0399	1.013	0.0411	1.044
18	0.0456	1.16	0.0447	1.135	0.0461	1.171
17	0.0513	1.30	0.0502	1.275	0.0518	1.315
16	0.0576	1.46	0.0564	1.433	0.0582	1.478
15	0.0647	1.64	0.0635	1.613	0.0653	1.659
14	0.0727	1.85	0.0712	1.81	0.0734	1.86
13	0.0816	2.07	0.0800	2.03	0.0824	2.09
12	0.0915	2.32	0.0897	2.28	0.0924	2.35
11	0.103	2.62	0.101	2.57	0.104	2.64
10	0.116	2.95	0.114	2.90	0.117	2.97
9	0.130	3.30	0.127	3.23	0.131	3.33
8	0.146	3.71	0.143	3.63	0.147	3.73
7	0.164	4.17	0.161	4.09	0.166	4.22
6	0.184	4.67	0.180	4.57	0.186	4.72
5	0.206	5.23	0.201	5.11	0.208	5.28
4	0.232	5.89	0.227	5.77	0.234	5.94
3	0.260	6.60	0.255	6.48	0.263	6.68
2	0.292	7.42	0.286	7.26	0.295	7.49
1	0.332	8.43	0.325	8.26	0.335	8.51
1/0	0.372	9.45	0.365	9.27	0.376	9.55
2/0	0.418	10.62	0.410	10.41	0.422	10.72
3/0	0.470	11.94	0.461	11.71	0.475	12.07
4/0	0.528	13.41	0.517	13.13	0.533	13.54
250 kcmil	0.575	14.61	0.564	14.33	0.581	14.76
300	0.630	16.00	0.617	15.67	0.636	16.15
350	0.681	17.30	0.667	16.94	0.688	17.48
400	0.728	18.49	0.713	18.11	0.735	18.67
450	0.772	19.61	0.757	19.23	0.780	19.81
500	0.813	20.65	0.797	20.24	0.821	20.85
550	0.855	21.72	0.838	21.29	0.864	21.95
600	0.893	22.68	0.875	22.23	0.902	22.91

Table 20.4 Continued on Next Page

Table 20.4 Continued

Conductor size	Nominal		Minimum[a]		Maximum[a]	
	inches	mm	inches (0.98 x nominal)	mm	inches (1.01 x nominal)	mm
650 kcmil	0.929	23.60	0.910	22.86	0.938	23.83
700	0.964	24.49	0.945	24.00	0.974	24.74
750	0.998	25.35	0.978	24.84	1.008	25.60
800	1.030	26.16	1.009	25.63	1.040	26.42
900	1.094	27.79	10.72	27.23	1.105	28.07
1000	1.152	29.26	1.129	28.68	1.164	29.57
1100	1.209	30.71	1.185	30.10	1.221	31.01
1200	1.263	32.08	1.238	31.45	1.276	32.41
1250	1.289	32.74	1.263	32.08	1.302	33.07
1300	1.314	33.38	1.288	32.72	1.327	33.71
1400	1.365	34.67	1.338	33.99	1.379	35.03
1500	1.412	35.86	1.384	35.15	1.426	36.22
1600	1.459	37.06	1.430	36.32	1.474	37.44
1700	1.504	38.20	1.474	37.44	1.519	38.58
1750	1.526	38.76	1.495	37.97	1.541	39.14
1800	1.548	39.32	1.517	38.53	1.563	39.70
1900	1.590	40.39	1.558	39.57	1.606	40.79
2000	1.632	41.45	1.599	40.61	1.648	41.86

[a] The values in these two columns apply where the wire standard (power cables principally) specifies maximum and minimum diameters for the conductor.

Table 20.4.1
Diameters over ASTM Class C round concentric-lay-stranded conductors

Conductor size	Nominal		Minimum[a]		Maximum[a]	
	Inches	mm	Inches (0.98 x nominal)	mm	Inches (1.01 x nominal)	mm
30 AWG	0.0115	0.292	0.0113	0.338	0.0116	0.295
29	0.0130	0.330	0.0127	0.323	0.0131	0.333
28	0.0145	0.368	0.0142	0.361	0.0146	0.371
27	0.0163	0.414	0.0160	0.406	0.0165	0.419
26	0.0182	0.465	0.0178	0.452	0.0184	0.467
25	0.0205	0.521	0.0201	0.511	0.0207	0.526
24	0.0230	0.584	0.0225	0.572	0.0232	0.589
23	0.0259	0.658	0.0254	0.645	0.0262	0.665
22	0.0290	0.737	0.0284	0.721	0.0293	0.744

Table 20.4.1 Continued on Next Page

Table 20.4.1 Continued

Conductor size	Nominal		Minimum[a]		Maximum[a]	
	Inches	mm	Inches (0.98 x nominal)	mm	Inches (1.01 x nominal)	mm
21 AWG	0.0327	0.830	0.0320	0.813	0.0330	0.838
20	0.0365	0.927	0.0358	0.909	0.0369	0.937
19	0.0412	1.046	0.0404	1.026	0.0416	1.057
18	0.0460	1.168	0.0451	1.146	0.0465	1.181
17	0.0519	1.318	0.0509	1.293	0.0524	1.331
16	0.0585	1.486	0.0573	1.455	0.0591	1.501
15	0.0655	1.664	0.0642	1.631	0.0662	1.681
14	0.0735	1.867	0.0720	1.829	0.0743	1.887
13	0.0825	2.096	0.0850	2.159	0.0833	2.116
12	0.0925	2.350	0.0907	2.304	0.0934	2.372
11 AWG – 2000 kcmil	b	b	b	b	b	b

[a] The values in these two columns apply where the wire standard (power cables principally) specifies maximum and minimum diameters for the conductor.

[b] Use Table 20.4.

Table 20.5
Nominal dimensions of round strands

AWG size of strand	Diameter		Cross-sectional area	
	Mils	mm	cmil	mm^2
40	3.1	0.079	9.61	0.00487
39	3.5	0.089	12.2	0.00621
38	4.0	0.102	16.0	0.00811
37	4.5	0.144	20.2	0.0103
36	5.0	0.127	25.0	0.0127
35	5.6	0.142	31.4	0.0159
34	6.3	0.160	39.7	0.0201
33	7.1	0.180	50.4	0.0255
32	8.0	0.203	64.0	0.0324
31	8.9	0.226	79.2	0.0401
30	10.0	0.254	100	0.0507
29	11.3	0.287	128	0.0647
28	12.6	0.320	159	0.0804
27	14.2	0.361	202	0.102
26	15.9	0.404	253	0.128
25	17.9	0.455	320	0.162

Table 20.5 Continued on Next Page

Table 20.5 Continued

AWG size of strand	Diameter		Cross-sectional area	
	Mils	mm	cmil	mm^2
24	20.1	0.511	404	0.205
23	22.6	0.574	511	0.259
22	25.3	0.643	640	0.324
21	28.5	0.724	812	0.412
20	32.0	0.813	1020	0.519

Table 20.6
Nominal strand and conductor dimensions for 19-wire combination round-wire unilay-stranded copper or aluminum conductors

AWG conductor size	Nominal strand dimensions								Conductor diameter					
	Large strand				Small strand									
	A Diameter		B Cross-sectional area		C Diameter		D Cross-sectional area		E = 3A + 2C Nominal		F = 0.98 x E Minimum[a]		G = 1.01 x E Maximum[a]	
	inch	mm	cmil	mm^2	inch	mm	cmil	mm^2	inch	mm	inch	mm	inch	mm
14	0.0159	0.4	253	0.128	0.0117	0.3	137	0.069	0.071	1.80	0.70	1.78	0.72	1.83
12	0.0201	0.5	404	0.205	0.0147	0.4	216	0.109	0.090	2.29	0.88	2.24	0.091	2.31
10	0.0253	0.6	640	0.324	0.0185	0.5	342	0.173	0.113	2.87	1.11	2.87	0.114	2.90
9	0.0284	0.7	807	0.408	0.0208	0.5	433	0.219	0.127	3.23	0.127	3.14	0.128	3.25
8	0.0319	0.8	1018	0.515	0.0234	0.6	548	0.277	0.143	3.63	1.40	3.56	0.144	3.66
7	0.0358	0.9	1282	0.649	0.0262	0.67	686	0.347	0.160	4.06	0.157	3.99	0.162	4.11
6	0.0402	1.0	1616	0.818	0.0294	0.7	864	0.437	0.179	4.55	0.175	4.45	0.181	4.60
5	0.0452	1.1	2043	1.034	0.0331	0.8	1096	0.555	0.202	5.13	0.198	5.03	0.204	5.18
4	0.0507	1.3	2570	1.301	0.0371	0.9	1376	0.696	0.226	5.74	0.221	5.61	0.228	5.79
3	0.0570	1.4	3249	1.644	0.0417	1.1	1739	0.880	0.254	6.45	0.249	6.32	0.257	6.53
2	0.0640	1.6	4096	2.073	0.0468	1.2	2190	1.108	0.286	7.26	0.280	7.11	0.289	7.34
1	0.0718	1.8	5155	2.609	0.0526	1.3	2767	1.400	0.321	8.15	0.316	8.03	0.324	8.23
1/0	0.0807	2.1	6512	3.296	0.0591	1.5	3493	1.768	0.360	9.14	0.353	8.97	0.364	9.25
2/0	0.0906	2.3	8208	4.154	0.0663	1.7	4396	2.225	0.404	10.26	0.396	10.06	0.408	10.36
3/0	0.1017	2.6	10343	5.234	0.0745	1.9	5550	2.809	0.454	11.53	0.445	11.30	0.459	11.66
4/0	0.1142	2.9	13042	6.600	0.0836	2.1	6989	3.537	0.510	12.95	0.500	12.70	0.515	13.08

[a] The values in these two columns apply where the wire standard (power cables principally) specifies maximum and minimum diameters for the conductor.

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30 D-C Conductor Resistance

30.1 For conductors for which the maximum resistance is not tabulated in this section (Section 30), the maximum resistance for a given size of the solid or stranded construction is to be determined by multiplying the maximum resistance tabulated in this section for uncoated copper of the same size and construction by the ratio of 100 percent IACS (International Annealed Copper Standard) to the percent conductivity of the conductor under consideration. For example, to determine the maximum resistance *R* at 25 °C (77°F) of a solid 16 AWG copper conductor having a nickel coating of a thickness equal to 10 percent of the diameter over the conductor, note that Table 30.1 assigns a value of 4.18 ohms per 1000 conductor feet or 13.7 ohms per 1000 meters to the uncoated solid copper conductor and that Table 5 of ASTM B 355-95 assigns a conductivity of 88.0 percent to the Class 10 nickel-coated solid copper conductor:

$$R_{max\ at\ 25°C} = 4.18 \times 100 / 88 = 4.75 \text{ ohms per 1000 conductor feet.}$$

$$R_{max\ at\ 25°C} = 13.7 \times 100 / 88 = 15.6 \text{ ohms per 1000 conductor meters.}$$

30.1 added May 6, 2003

Table 30.1
Maximum direct-current resistance of solid conductors of aluminum, copper-clad aluminum, and uncoated copper

Table 30.1 revised May 6, 2003

AWG size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
56	–	–	44064	144574	–	–	44880	147251
55	–	–	34986	114789	–	–	35700	117132
54	–	–	27540	90359	–	–	28050	92032
53	–	–	21624	70948	–	–	22032	72287
52	–	–	17340	56893	–	–	17748	58231
51	–	–	13668	44845	–	–	13974	45849
50	–	–	10812	35474	–	–	11016	36144
49	–	–	8588	28179	–	–	8752	28714
48	–	–	6885	22500	–	–	7018	23025
47	–	–	5396	17704	–	–	5508	18072
46	–	–	4294	14089	–	–	4376	14357
45	–	–	3417	11211	–	–	3478	11412
44	–	–	2642	8668	–	–	2693	8835
43	–	–	2183	7162	–	–	2224	7296
42	–	–	1693	5555	–	–	1724	5656

Table 30.1 Continued on Next Page

Table 30.1 Continued

AWG size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
41	–	–	1346	4418	–	–	1377	4518
40	–	–	1102	3614	–	–	1122	3681
39	–	–	864	2835	–	–	880	2888
38	–	–	661	2169	–	–	674	2212
37	–	–	522	1713	–	–	532	1747
36	–	–	423	1389	–	–	431	1416
35	–	–	338	1108	–	–	344	1128
34	–	–	266	873	–	–	271	890
33	–	–	210	689	–	–	214	703
32	–	–	165	542	–	–	168	552
31	–	–	134	438	–	–	137	448
30	–	–	106	347	–	–	108	354
29	–	–	82.8	271	–	–	84.5	277
28	109	358	66.6	218	111	364	67.9	223
27	85.9	282	52.4	172	87.6	287	53.4	175
26	68.6	225	41.8	138	70.0	230	42.6	140
25	54.1	178	33.0	108	55.3	181	33.7	110
24	43.0	141	26.2	85.9	43.8	144	26.7	87.6
23	33.9	111	20.7	67.9	34.6	114	21.1	69.3
22	27.1	88.9	16.5	54.3	27.6	90.6	16.8	55.3
21	21.5	70.5	13.1	42.7	21.8	71.5	13.3	43.6
20	16.9	55.4	10.3	33.9	17.2	56.6	10.5	34.6
19	13.5	44.2	8.21	26.9	13.7	45.0	8.37	27.4
18	10.7	35.1	6.52	21.4	10.9	35.7	6.64	21.8
17	8.45	27.7	5.15	16.9	8.61	28.2	5.25	17.2
16	6.72	22.0	4.10	13.5	6.85	22.5	4.18	13.7
15	5.31	17.4	3.24	10.6	5.41	17.8	3.30	10.8
14	4.21	13.8	2.57	8.45	4.30	14.1	2.62	8.61
13	3.35	11.0	2.04	6.69	3.41	11.2	2.08	6.82
12	2.65	8.71	1.62	5.31	2.71	8.89	1.65	5.42
11	2.11	6.92	1.29	4.22	2.15	7.06	1.32	4.30
10	1.670	5.479	1.019	3.343	1.703	5.590	1.038	3.408
9	1.325	4.347	0.8084	2.652	1.352	4.435	0.8242	2.704
8	1.051	3.446	0.6407	2.102	1.071	3.515	0.6532	2.143

Table 30.1 Continued on Next Page

Table 30.1 Continued

AWG size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
7	0.8328	2.733	0.5081	1.667	0.8497	2.788	0.5181	1.699
6	0.6609	2.168	0.4031	1.323	0.6741	2.211	0.4110	1.348
5	0.5242	1.720	0.3197	1.049	0.5361	1.754	0.3260	1.070
4	0.4155	1.363	0.2535	0.8315	0.4239	1.390	0.2585	0.8478
3	0.3296	1.081	0.2010	0.6595	0.3362	1.103	0.2050	0.6725
2	0.2613	0.8574	0.1594	0.5231	0.2666	0.8747	0.1626	0.5333
1	0.2073	0.6798	0.1264	0.4146	0.2113	0.6935	0.1289	0.4228
1/0	0.1643	0.5390	0.1002	0.3287	0.1676	0.5499	0.1022	0.3353
2/0	0.1304	0.4275	0.07949	0.2608	0.1329	0.4362	0.08105	0.2659
3/0	0.1033	0.3392	0.06306	0.2069	0.1055	0.3460	0.06429	0.2109
4/0	0.08196	0.2689	0.04999	0.1640	0.08361	0.2743	0.05098	0.1673

Table 30.2
Maximum direct-current resistance of solid copper conductors coated with tin or a tin/lead alloy

Table 30.2 revised May 6, 2003

AWG Size of Conductor	20°C		25°C	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
56	45792	150244	46640	153026
55	36358	119291	37100	121725
54	28620	93902	29150	95641
53	22472	73731	22896	75122
52	18020	59124	18444	60515
51	19504	63993	14522	47747
50	11236	36865	11448	37561
49	8925	29284	9095	29840
48	7155	23476	7293	23928
47	5607	18398	5724	18780
46	4468	14642	4547	14920
45	3551	11651	3615	11860
44	2745	9008	2798	9182
43	2268	7443	2311	7582
42	1760	5773	1791	5878
41	1399	4591	1431	4695
40	1145	3756	1166	3826

Table 30.2 Continued on Next Page

Table 30.2 Continued

AWG Size of Conductor	20°C		25°C	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
39	898	2946	915	3001
38	687	2254	701	2299
37	543	1781	553	1815
36	440	1443	448	1471
35	351	1151	357	1172
34	277	908	282	925
33	218	716	223	730
32	172	563	175	574
31	139	456	142	466
30	110	361	112	368
29	86.1	282	87.8	289
28	69.3	227	70.6	232
27	54.5	179	55.6	182
26	43.5	143	44.3	145
25	34.4	112	35.0	115
24	27.3	89.3	27.8	91.1
23	21.5	70.6	22.0	72.0
22	17.2	56.4	17.5	57.5
21	13.6	44.4	13.8	45.3
20	10.7	35.2	10.9	36.0
19	8.54	28.0	8.70	28.6
18	6.77	22.2	6.91	22.7
17	5.37	17.6	5.47	17.9
16	4.26	14.0	4.35	14.2
15	3.38	11.1	3.44	11.2
14	2.68	8.78	2.72	8.96
13	2.12	6.97	2.16	7.10
12	1.68	5.53	1.71	5.64
11	1.34	4.39	1.37	4.48
10	1.060	3.476	1.080	3.545
9	0.8319	2.730	0.8483	2.784
8	0.6594	2.163	0.6724	2.206
7	0.5229	1.716	0.5332	1.749
6	0.4148	1.361	0.4230	1.388
5	0.3291	1.079	0.3356	1.101
4	0.2608	0.8559	0.2660	0.8727

Table 30.2 Continued on Next Page

Table 30.2 Continued

AWG Size of Conductor	20°C		25°C	
	Ohms per 1000 ft	Ohms per 1000 m	Ohms per 1000 ft	Ohms per 1000 m
3	0.2069	0.6788	0.2109	0.6922
2	0.1641	0.5384	0.1673	0.5489
1	0.1300	0.4268	0.1326	0.4352
1/0	0.1026	0.3367	0.1047	0.3433
2/0	0.08140	0.2670	0.08300	0.2723
3/0	0.06457	0.2119	0.06583	0.2160
4/0	0.05119	0.1680	0.05219	0.1713

Table 30.3
Maximum direct-current resistance of aluminum, copper-clad aluminum, and compact-stranded aluminum conductors and uncoated copper conductors: concentric-stranded ASTM Classes B, C, and D, compact-stranded, and compressed-stranded

Table 30.3 revised May 6, 2003

Size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
30 AWG	–	–	108	354	–	–	110	361
29	–	–	84.3	277	–	–	86.0	282
28	111	364	67.9	223	113	371	69.2	227
27	87.6	287	53.4	175	89.4	293	54.5	179
26	70.0	230	42.7	140	71.3	234	43.5	143
25	55.3	181	33.7	111	56.4	185	34.4	113
24	43.8	144	26.7	87.6	44.6	146	27.2	89.2
23	34.6	114	21.1	69.2	35.3	116	21.5	70.5
22	27.7	90.9	16.9	55.4	28.2	92.5	17.2	56.4
21	21.8	71.5	13.3	43.6	22.1	72.5	13.5	44.3
20	17.4	57.1	10.6	34.6	17.7	58.1	10.8	35.3
19	13.7	44.9	8.36	27.4	14.0	45.9	8.53	28.0
18	10.9	35.8	6.66	21.8	11.1	36.4	6.79	22.2
17	8.68	28.5	5.27	17.3	8.86	29.1	5.37	17.6
16	6.87	22.5	4.18	13.7	7.00	23.0	4.26	14.0
15	5.41	17.8	3.31	10.9	5.53	18.1	3.37	11.1
14	4.30	14.1	2.62	8.62	4.38	14.4	2.68	8.78
13	3.41	11.2	2.08	6.82	3.48	11.4	2.12	6.97
12	2.71	8.88	1.65	5.43	2.76	9.07	1.68	5.53
11	2.15	7.07	1.32	4.30	2.19	7.20	1.34	4.39
10	1.70	5.589	1.039	3.409	1.738	5.702	1.060	3.476

Table 30.3 Continued on Next Page

Table 30.3 Continued

Size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
9 AWG	1.35	4.434	0.8245	2.705	1.379	4.524	0.8407	2.758
8	1.07	3.515	0.6535	2.144	1.092	3.585	0.6663	2.186
7	0.8495	2.787	0.5182	1.700	0.8666	2.844	0.5284	1.734
6	0.6740	2.211	0.4112	1.348	0.6876	2.256	0.4192	1.375
5	0.5346	1.754	0.3261	1.070	0.5454	1.789	0.3325	1.091
4	0.4238	1.390	0.2585	0.8481	0.4324	1.419	0.2636	0.8649
3	0.3361	1.103	0.2050	0.6727	0.3429	1.125	0.2091	0.6860
2	0.2665	0.8745	0.1626	0.5335	0.2719	0.8922	0.1659	0.5440
1	0.2113	0.6934	0.1289	0.4230	0.2156	0.7074	0.1315	0.4313
1/0	0.1676	0.5498	0.1022	0.3354	0.1710	0.5609	0.1042	0.3419
2/0	0.1329	0.4361	0.08108	0.2660	0.1356	0.4450	0.08267	0.2712
3/0	0.1055	0.3459	0.06431	0.2110	0.1075	0.3529	0.06558	0.2151
4/0	0.08360	0.2743	0.05099	0.1673	0.08528	0.2798	0.05200	0.1705
250 kcmil	0.07076	0.2322	0.04316	0.1416	0.07219	0.2368	0.04401	0.1444
300	0.05897	0.1935	0.03597	0.1180	0.06015	0.1974	0.03667	0.1204
350	0.05054	0.1659	0.03082	0.1011	0.05156	0.1691	0.03144	0.1031
400	0.04423	0.1450	0.02698	0.08851	0.04511	0.1480	0.02751	0.09024
450	0.03931	0.1289	0.02398	0.07867	0.04010	0.1316	0.02445	0.08021
500	0.03537	0.1161	0.02158	0.07080	0.03609	0.1184	0.02200	0.07220
550	0.03216	0.1055	0.01961	0.06436	0.03281	0.1076	0.02000	0.06563
600	0.02948	0.09673	0.01798	0.05900	0.03008	0.09867	0.01834	0.06016
650	0.02721	0.08928	0.01660	0.05447	0.02776	0.09109	0.01692	0.05553
700	0.02527	0.08291	0.01541	0.05057	0.02578	0.08458	0.01572	0.05157
750	0.02358	0.07738	0.01438	0.04721	0.02406	0.07894	0.01467	0.04812
800	0.02211	0.07254	0.01348	0.04425	0.02255	0.07400	0.01375	0.04512
900	0.01966	0.06448	0.01199	0.03933	0.02005	0.06578	0.01222	0.04011
1000	0.01769	0.05804	0.01079	0.03540	0.01804	0.05920	0.01101	0.03610
1100	0.01609	0.05275	0.009809	0.03218	0.01640	0.05383	0.01000	0.03281
1200	0.01474	0.04836	0.008992	0.02950	0.01503	0.04934	0.009169	0.03008
1250	0.01415	0.04643	0.008632	0.02833	0.01443	0.04736	0.008802	0.02888
1300	0.01357	0.04465	0.008230	0.02723	0.01388	0.04554	0.008463	0.02776
1400	0.01264	0.04145	0.007707	0.02529	0.01289	0.04229	0.007859	0.02579
1500	0.01179	0.03869	0.007193	0.02360	0.01203	0.03947	0.007335	0.02406
1600	0.01106	0.03627	0.006744	0.02212	0.01128	0.03701	0.006877	0.02256

Table 30.3 Continued on Next Page

Table 30.3 Continued

Size of conductor	20°C				25°C			
	Aluminum and copper-clad aluminum		Uncoated copper		Aluminum and copper-clad aluminum		Uncoated copper	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
1700 kcmil	0.01040	0.03414	0.006347	0.02083	0.01062	0.03482	0.006472	0.02124
1750	0.01011	0.03316	0.006166	0.02023	0.01031	0.03383	0.006287	0.02062
1800	0.009827	0.03224	0.005995	0.01967	0.01003	0.03290	0.006112	0.02005
1900	0.009310	0.03055	0.005679	0.01864	0.009497	0.03116	0.005791	0.01900
2000	0.008844	0.02902	0.005395	0.01770	0.009023	0.02960	0.005501	0.01804

Table 30.4
Maximum direct-current resistance of copper conductors, concentric-stranded ASTM Class B with each strand coated with tin or a tin/lead alloy and compressed-stranded ASTM Class B with each strand coated

Size of Conductor	20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
30 AWG	116	381	118	387
29	90.5	297	92.3	303
28	72.8	239	74.3	244
27	57.3	188	58.5	192
26	45.8	150	46.7	153
25	36.2	199	36.9	121
24	28.7	94.2	29.2	95.8
23	22.7	74.5	23.1	75.8
22	18.1	59.4	18.5	60.7
21	14.3	46.9	14.5	47.6
20	11.2	36.7	11.4	37.4
19	8.88	29.1	9.06	29.7
18	7.06	23.2	7.19	23.6
17	5.59	18.3	5.70	18.7
16	4.45	14.6	4.53	14.9
15	3.44	11.3	3.51	11.5
14	2.73	8.96	2.78	9.14
13	2.16	7.10	2.20	7.24
12	1.72	5.64	1.75	5.75
11	1.37	4.48	1.39	4.56
10	1.080	3.546	1.102	3.615
9	0.8574	2.813	0.8742	2.868

Table 30.4 Continued on Next Page

Table 30.4 Continued

Size of Conductor	20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
8 AWG	0.6795	2.230	0.6929	2.274
7	0.5389	1.768	0.5495	1.802
6	0.4276	1.403	0.4359	1.430
5	0.3392	1.113	0.3458	1.134
4	0.2689	0.8820	0.2742	0.8993
3	0.2132	0.6996	0.2175	0.7133
2	0.1691	0.5548	0.1724	0.5657
1	0.1340	0.4398	0.1367	0.4485
1/0	0.1063	0.3487	0.1084	0.3556
2/0	0.08432	0.2766	0.08598	0.2820
3/0	0.06688	0.2194	0.06820	0.2238
4/0	0.05248	0.1722	0.05352	0.1755
250 kcmil	0.04488	0.1473	0.04577	0.1501
300	0.03740	0.1227	0.03814	0.1252
350	0.03206	0.1052	0.03270	0.1072
400	0.02776	0.09109	0.02831	0.09288
450	0.02467	0.08097	0.02516	0.08256
500	0.02222	0.07287	0.02264	0.07431
550	0.02040	0.06693	0.02080	0.06825
600	0.01871	0.06135	0.01907	0.06257
650	0.01709	0.05606	0.01742	0.05715
700	0.01586	0.05205	0.01618	0.05307
750	0.01481	0.04858	0.01510	0.04953
800	0.01388	0.04554	0.01416	0.04644
900	0.01234	0.04048	0.01259	0.04128
1000	0.01111	0.03643	0.01132	0.03715
1100	0.01010	0.03312	0.01029	0.03377
1200	0.009254	0.03037	0.009436	0.03096
1250	0.008884	0.02915	0.009059	0.02972
1300	0.008543	0.02803	0.008711	0.02858

Table 30.4 Continued on Next Page

Table 30.4 Continued

Size of Conductor	20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
1400 kcmil	0.007933	0.02602	0.008089	0.02654
1500	0.007403	0.02429	0.007549	0.02477
1600	0.006941	0.02278	0.007078	0.02322
1700	0.006533	0.02143	0.006661	0.02186
1750	0.006346	0.02082	0.006471	0.02123
1800	0.006171	0.02024	0.006291	0.02063
1900	0.005845	0.01918	0.005960	0.01955
2000	0.005552	0.01822	0.005662	0.01857

Table 30.5
Maximum direct-current resistance of copper conductors, concentric-stranded ASTM Classes C and D with each strand coated with tin or a tin/lead alloy and compressed-stranded ASTM Classes C and D with each strand coated

Size of conductor	Class C				Class D			
	20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
30 AWG	116	381	118	387	116	381	118	387
29	90.5	297	92.3	303	90.5	297	92.3	303
28	72.8	239	74.3	244	72.8	239	74.3	244
27	57.3	188	58.5	192	57.3	188	58.5	192
26	45.8	150	46.7	153	45.8	150	46.7	153
25	36.2	119	36.9	121	36.2	119	36.9	121
24	28.7	94.2	29.2	95.8	28.7	94.2	29.2	95.8
23	22.7	74.5	23.1	75.8	22.7	74.5	23.1	75.8
22	18.1	59.4	18.5	60.7	18.1	59.4	18.5	60.7
21	14.3	46.9	14.5	47.6	14.3	46.9	14.5	47.6
20	11.4	37.4	11.6	38.1	11.4	37.4	11.6	38.1
19	8.98	29.5	9.16	30.1	8.98	29.5	9.16	30.1
18	7.15	23.5	7.29	23.9	7.15	23.5	7.29	23.9
17	5.65	18.5	5.76	18.9	5.65	18.5	5.76	18.9
16	4.44	14.6	4.53	14.9	4.49	14.7	4.58	15.0
15	3.52	11.5	3.58	11.7	3.55	11.6	3.62	11.9
14	2.78	9.15	2.85	9.32	2.82	9.25	2.89	9.42
13	2.21	7.26	2.25	7.41	2.21	7.26	2.25	7.41
12	1.75	5.75	1.78	5.88	1.75	5.75	1.78	5.88
11	1.37	4.48	1.39	4.56	1.40	4.57	1.42	4.66

Table 30.5 Continued on Next Page

Table 30.5 Continued

Size of conductor	Class C				Class D			
	20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
10 AWG	1.08	3.55	1.10	3.62	1.10	3.62	1.12	3.69
9	0.857	2.82	0.874	2.87	0.875	2.88	0.892	2.93
8	0.679	2.23	0.692	2.27	0.679	2.23	0.693	2.27
7	0.539	1.76	0.550	1.81	0.539	1.76	0.550	1.81
6	0.427	1.41	0.436	1.43	0.427	1.41	0.436	1.43
5	0.339	1.11	0.346	1.13	0.339	1.11	0.346	1.13
4	0.269	0.882	0.274	0.900	0.269	0.882	0.274	0.900
3	0.213	0.700	0.217	0.713	0.213	0.700	0.217	0.713
2	0.169	0.555	0.172	0.566	0.169	0.555	0.172	0.566
1	0.134	0.440	0.137	0.449	0.134	0.440	0.137	0.449
1/0	0.106	0.349	0.108	0.355	0.106	0.349	0.108	0.355
2/0	0.0844	0.276	0.0860	0.282	0.0844	0.276	0.0860	0.282
3/0	0.0669	0.219	0.0681	0.223	0.0669	0.219	0.0681	0.223
4/0	0.0530	0.174	0.0541	0.177	0.0530	0.174	0.0541	0.177
250 kcmil	0.0449	0.147	0.0458	0.150	0.0449	0.147	0.0458	0.150
300	0.0374	0.122	0.0381	0.125	0.0374	0.122	0.0381	0.125
350	0.0320	0.105	0.0326	0.107	0.0320	0.105	0.0326	0.107
400	0.0280	0.0920	0.0286	0.0938	0.0280	0.0920	0.0286	0.0938
450	0.0249	0.0818	0.0254	0.0834	0.0249	0.0818	0.0254	0.0834
500	0.0224	0.0736	0.0228	0.0751	0.0224	0.0736	0.0228	0.0751
550	0.0204	0.0669	0.0208	0.0682	0.0204	0.0669	0.0208	0.0682
600	0.0187	0.0614	0.0191	0.0625	0.0187	0.0614	0.0191	0.0625
650	0.0172	0.0566	0.0176	0.0577	0.0172	0.0566	0.0176	0.0577
700	0.0160	0.0526	0.0163	0.0537	0.0160	0.0526	0.0163	0.0537
750	0.0150	0.0491	0.0153	0.0501	0.0150	0.0491	0.0153	0.0501
800	0.0141	0.0460	0.0143	0.0469	0.0141	0.0460	0.0143	0.0469
900	0.0124	0.0409	0.0128	0.0417	0.0124	0.0409	0.0128	0.0417
1000	0.0111	0.0364	0.0113	0.0371	0.0112	0.0368	0.0114	0.0375
1100	0.0102	0.0335	0.0104	0.0342	0.0102	0.0335	0.0104	0.0342
1200	0.00935	0.0307	0.00954	0.0313	0.00935	0.0307	0.00954	0.0313
1250	0.00898	0.0295	0.00915	0.0300	0.00898	0.0295	0.00915	0.0300
1300	0.00863	0.0284	0.00880	0.0289	0.00863	0.0284	0.00880	0.0289
1400	0.00794	0.0260	0.00809	0.0265	0.00802	0.0263	0.00817	0.0268
1500	0.00741	0.0243	0.00755	0.0248	0.00748	0.0246	0.00763	0.0250

Table 30.5 Continued on Next Page

Table 30.5 Continued

Size of conductor	Class C				Class D			
	20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
1600 kcmil	0.00702	0.0231	0.00715	0.0235	0.00702	0.0231	0.00715	0.0235
1700	0.00660	0.0216	0.00673	0.0220	0.00660	0.0216	0.00673	0.0220
1750	0.00642	0.0210	0.00654	0.0214	0.00642	0.0210	0.00654	0.0214
1800	0.00617	0.0202	0.00629	0.0206	0.00623	0.0205	0.00635	0.0208
1900	0.00584	0.0192	0.00596	0.0196	0.00591	0.0194	0.00602	0.0198
2000	0.00555	0.0183	0.00566	0.0186	0.00561	0.0184	0.00572	0.0188

Table 30.6
Maximum direct-current resistance of 19-wire combination round-wire unilay-stranded copper conductors

Metal coating of strands	AWG size of conductors	20°C		25°C	
		Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
Each Strand Coated	14	2.78	9.15	2.85	9.32
	13	2.21	7.26	2.25	7.41
	12	1.75	5.75	1.78	5.88
	11	1.37	4.48	1.39	4.56
	10	1.08	3.55	1.10	3.62
	9	0.857	2.82	0.874	2.87
	8	0.679	2.23	0.692	2.27
	7	0.539	1.76	0.550	1.81
	6	0.427	1.41	0.436	1.43
	5	0.339	1.11	0.346	1.13
	4	0.269	0.882	0.274	0.900
	3	0.213	0.700	0.217	0.713
	2	0.169	0.555	0.172	0.566
	1	0.1340	0.4398	0.1367	0.4485
	1/0	0.1063	0.3487	0.1084	0.3556
	2/0	0.08432	0.2766	0.08598	0.2820
	3/0	0.06688	0.2194	0.06820	0.2238
	4/0	0.05248	0.1722	0.05352	0.1755
Each Coated	14	2.62	8.62	2.68	8.78
	13	2.08	6.82	2.12	6.97
	12	1.65	5.43	1.68	5.53

Table 30.6 Continued on Next Page

Table 30.6 Continued

Metal coating of strands	AWG size of conductors	20°C		25°C	
		Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
Strand	11	1.32	4.30	1.34	4.39
	10	1.039	3.409	1.060	3.476
	9	0.8245	2.705	0.8407	2.758
	8	0.6535	2.144	0.6663	2.186
	7	0.5182	1.700	0.5284	1.734
	6	0.4122	1.348	0.4192	1.375
	5	0.3261	1.070	0.3225	1.091
	4	0.2585	0.8481	0.2636	0.8649
Uncoated	3	0.2050	0.6727	0.2091	0.6860
	2	0.1626	0.5335	0.1659	0.5440
	1	0.1289	0.4230	0.1315	0.4313
	1/0	0.1022	0.3354	0.1042	0.3419
	2/0	0.08108	0.2660	0.08267	0.2712
	3/0	0.06431	0.2110	0.06558	0.2151
	4/0	0.05099	0.1673	0.05200	0.1705

Table 30.6A
Maximum direct-current resistance of 19-wire combination round-wire unilay-stranded aluminum conductors

AWG size of conductor	20°C		25°	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
6	0.6716	2.204	0.6852	2.248
5	0.5326	1.748	0.5436	1.784
4	0.4224	1.386	0.4309	1.414
3	0.3351	1.100	0.3418	1.121
2	0.2656	0.8714	0.2710	0.8892
1	0.2107	0.6913	0.2149	0.7051
1/0	0.1671	0.5483	0.1705	0.5594
2/0	0.1325	0.4347	0.1351	0.4433
3/0	0.1051	0.3448	0.1072	0.3517
4/0	0.08332	0.2734	0.08501	0.2789

Table 30.7
Maximum direct-current resistance of ASTM Class G stranded conductors

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
14 AWG	2.65	8.70	2.70	8.86	2.82	9.24	2.87	9.41	–	–	–	–
13	2.10	6.90	2.14	7.03	2.23	7.33	2.28	7.47	–	–	–	–
12	1.67	5.48	1.70	5.58	1.77	5.81	1.81	5.93	–	–	–	–
11	1.32	4.35	1.35	4.42	1.40	4.61	1.43	4.70	–	–	–	–
10	1.05	3.45	1.07	3.51	1.11	3.66	1.13	3.73	–	–	–	–
9	0.832	2.73	0.849	2.78	0.884	2.90	0.902	2.96	–	–	–	–
8	0.660	2.16	0.673	2.20	0.701	2.30	0.715	2.35	–	–	–	–
7	0.523	1.71	0.533	1.75	0.545	1.79	0.555	1.82	0.858	2.82	0.875	2.88
6	0.415	1.37	0.423	1.39	0.431	1.42	0.441	1.45	0.680	2.23	0.695	2.27
5	0.329	1.08	0.336	1.10	0.343	1.12	0.349	1.14	0.540	1.77	0.551	1.81
4	0.261	0.857	0.266	0.873	0.271	0.890	0.276	0.908	0.428	1.41	0.437	1.43
3	0.207	0.679	0.211	0.693	0.215	0.707	0.219	0.720	0.340	1.11	0.347	1.13
2	0.164	0.539	0.167	0.550	0.170	0.560	0.174	0.571	0.369	0.883	0.274	0.901
1	0.132	0.431	0.134	0.440	0.137	0.449	0.140	0.457	0.215	0.707	0.220	0.721
1/0	0.104	0.342	0.106	0.349	0.108	0.355	0.110	0.362	0.170	0.560	0.174	0.571
2/0	0.0826	0.271	0.0843	0.276	0.0860	0.282	0.0876	0.288	0.136	0.445	0.139	0.454
3/0	0.0656	0.215	0.0668	0.219	0.0681	0.223	0.0696	0.228	0.107	0.353	0.109	0.360
4/0	0.0520	0.170	0.0530	0.174	0.0541	0.177	0.0552	0.181	0.0853	0.279	0.0869	0.286
250 kcmil	0.0443	0.145	0.0451	0.148	0.0460	0.151	0.0469	0.154	0.0725	0.238	0.0740	0.243
300	0.0368	0.121	0.0375	0.123	0.0384	0.125	0.0391	0.129	0.0604	0.198	0.0616	0.202
350	0.0316	0.104	0.0322	0.106	0.0328	0.108	0.0335	0.110	0.0518	0.170	0.0528	0.173
400	0.0276	0.0917	0.0282	0.0924	0.0288	0.0942	0.0293	0.0962	0.0453	0.149	0.0462	0.152
450	0.0246	0.0806	0.0251	0.0822	0.0255	0.0838	0.0260	0.0855	0.0403	0.132	0.0411	0.135
500	0.0221	0.0725	0.0225	0.0704	0.0230	0.0755	0.0235	0.0769	0.0362	0.119	0.0370	0.121

Table 30.7 Continued on Next Page

Table 30.7 Continued

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
550 kcmil	0.0202	0.0663	0.0206	0.0675	0.0210	0.0690	0.0214	0.0703	0.0332	0.108	0.0338	0.111
600	0.0186	0.0607	0.0189	0.0619	0.0193	0.0631	0.0196	0.0644	0.0304	0.0996	0.0310	0.102
650	0.0171	0.0561	0.0174	0.0571	0.0177	0.0583	0.0182	0.0595	0.0280	0.0919	0.0286	0.0937
700	0.0159	0.0520	0.0162	0.0530	0.0165	0.0542	0.0168	0.0552	0.0260	0.0834	0.0265	0.0871
750	0.0148	0.0486	0.0151	0.0496	0.0154	0.0505	0.0157	0.0515	0.0243	0.0797	0.0248	0.0813
800	0.0139	0.0456	0.0142	0.0464	0.0145	0.0473	0.0147	0.0483	0.0227	0.0747	0.0233	0.0762
900	0.0123	0.0405	0.0125	0.0413	0.0129	0.0421	0.0131	0.0429	0.0202	0.0664	0.0206	0.0677
1000	0.0111	0.0364	0.0113	0.0371	0.0115	0.0379	0.0117	0.0387	0.0183	0.0598	0.0186	0.0610
1100	0.0101	0.0332	0.0103	0.0338	0.0105	0.0345	0.0107	0.0351	0.0165	0.0543	0.0169	0.0554
1200	0.00926	0.0304	0.00944	0.0310	0.00963	0.0316	0.00981	0.0322	0.0152	0.0498	0.0155	0.0508
1250	0.00888	0.0292	0.00906	0.0297	0.00924	0.0303	0.00942	0.0309	0.0146	0.0478	0.0149	0.0488
1300	0.00855	0.0280	0.00871	0.0286	0.00888	0.0292	0.00906	0.0297	0.0140	0.0460	0.0143	0.0469
1400	0.00794	0.0260	0.00809	0.0265	0.00825	0.0270	0.00842	0.0276	0.0131	0.0426	0.0133	0.0436
1500	0.00741	0.0243	0.00755	0.0248	0.00770	0.0253	0.00785	0.0258	0.0121	0.0398	0.0123	0.0406
1600	0.00701	0.0230	0.00715	0.0235	0.00729	0.0239	0.00744	0.0244	0.0115	0.0377	0.0117	0.0385
1700	0.00660	0.0216	0.00672	0.0220	0.00686	0.0225	0.00700	0.0230	0.0108	0.0355	0.0110	0.0362
1750	0.00641	0.0210	0.00654	0.0214	0.00666	0.0218	0.00679	0.0223	0.0105	0.0345	0.0107	0.0352
1800	0.00623	0.0204	0.00635	0.0208	0.00648	0.0212	0.00661	0.0216	0.0102	0.0335	0.0104	0.0342
1900	0.00591	0.0194	0.00602	0.0198	0.00614	0.0201	0.00626	0.0205	0.00968	0.0317	0.00987	0.0323
2000	0.00561	0.0184	0.00572	0.0188	0.00583	0.0192	0.00595	0.0195	0.00919	0.0302	0.00937	0.0308

Table 30.8
Maximum direct-current resistance of ASTM Class H stranded conductors

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
8 AWG	0.666	2.18	0.679	2.23	0.708	2.33	0.722	2.37	–	–	–	–
7	0.528	1.73	0.539	1.76	0.561	1.85	0.572	1.88	–	–	–	–
6	0.419	1.38	0.427	1.41	0.446	1.46	0.454	1.49	–	–	–	–
5	0.333	1.09	0.339	1.11	0.353	1.16	0.360	1.18	–	–	–	–
4 (wires)	0.263	0.865	0.268	0.881	0.279	0.918	0.286	0.936	–	–	–	–
3	0.209	0.686	0.213	0.700	0.222	0.728	0.226	0.743	–	–	–	–
2 (133)	0.166	0.544	0.169	0.555	0.172	0.566	0.175	0.576	0.271	0.891	0.277	0.910
2 (259)	0.166	0.547	0.170	0.557	0.176	0.580	0.181	0.592	–	–	–	–
1	0.133	0.434	0.135	0.442	0.141	0.460	0.143	0.469	–	–	–	–
1/0	0.105	0.344	0.107	0.350	0.109	0.357	0.111	0.364	0.171	0.563	0.175	0.574
2/0	0.0830	0.272	0.0847	0.277	0.0864	0.284	0.0880	0.289	0.136	0.447	0.139	0.456
3/0 (259)	0.0659	0.216	0.0672	0.220	0.0685	0.224	0.0699	0.230	0.108	0.354	0.110	0.361
3/0 (427)	0.0662	0.217	0.0675	0.221	0.0703	0.231	0.0717	0.236	–	–	–	–
4/0 (259)	0.0522	0.171	0.0532	0.174	0.0544	0.179	0.0554	0.182	0.0857	0.280	0.0874	0.287
4/0 (427)	0.0525	0.172	0.0536	0.175	0.0546	0.180	0.0557	0.183	0.0861	0.283	0.0878	0.288
250 kcmil	0.0445	0.146	0.0453	0.149	0.0462	0.152	0.0471	0.155	0.0728	0.239	0.0743	0.244
300	0.0370	0.121	0.0377	0.123	0.0386	0.126	0.0393	0.129	0.0607	0.199	0.0619	0.203
350	0.0317	0.104	0.0323	0.106	0.0330	0.108	0.0337	0.110	0.0520	0.170	0.0530	0.174
400	0.0277	0.0911	0.0284	0.0929	0.0289	0.0948	0.0295	0.0966	0.0455	0.149	0.0464	0.152
450	0.0247	0.0810	0.0252	0.0826	0.0257	0.0843	0.0262	0.0859	0.0405	0.133	0.0413	0.136
500	0.0222	0.0729	0.0226	0.0744	0.0232	0.0758	0.0236	0.0773	0.0364	0.119	0.0371	0.122
550	0.0204	0.0669	0.0208	0.0682	0.0212	0.0696	0.0216	0.0709	0.0335	0.110	0.0341	0.112
600	0.0187	0.0613	0.0191	0.0625	0.0195	0.0638	0.0198	0.0650	0.0306	0.100	0.0312	0.103
650	0.0172	0.0566	0.0175	0.0577	0.0180	0.0589	0.0183	0.0600	0.0283	0.0928	0.0289	0.0947
700	0.0160	0.0525	0.0163	0.0536	0.0166	0.0547	0.0170	0.0557	0.0262	0.0862	0.0268	0.0879

Table 30.8 Continued on Next Page

Table 30.8 Continued

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
750 kcmil	0.0150	0.0491	0.0152	0.0500	0.0155	0.0510	0.0158	0.0520	0.0245	0.0804	0.0250	0.0820
800	0.0140	0.0460	0.0143	0.0470	0.0146	0.0478	0.0149	0.0488	0.0230	0.0754	0.0235	0.0769
900	0.0124	0.0409	0.0128	0.0417	0.0130	0.0425	0.0133	0.0434	0.0204	0.0670	0.0208	0.0683
1000	0.0112	0.0368	0.0114	0.0375	0.0116	0.0382	0.0119	0.0390	0.0184	0.0603	0.0188	0.0615
1100	0.0102	0.0335	0.0104	0.0341	0.0106	0.0348	0.0108	0.0354	0.0167	0.0549	0.0170	0.0559
1200	0.00934	0.0307	0.00953	0.0312	0.00972	0.0319	0.00990	0.0325	0.0153	0.0503	0.0156	0.0513
1250	0.00897	0.0295	0.00915	0.0300	0.00933	0.0306	0.00952	0.0312	0.0147	0.0482	0.0150	0.0493
1300	0.00863	0.0283	0.00879	0.0289	0.00897	0.0295	0.00915	0.0300	0.0142	0.0464	0.0144	0.0473
1400	0.00801	0.0263	0.00817	0.0268	0.00833	0.0273	0.00850	0.0278	0.0132	0.0430	0.0134	0.0439
1500	0.00748	0.0245	0.00762	0.0250	0.00777	0.0255	0.00793	0.0260	0.0122	0.0402	0.0125	0.0410
1600	0.00701	0.0230	0.00715	0.0235	0.00729	0.0239	0.00744	0.0244	0.0115	0.0377	0.0117	0.0385
1700	0.00660	0.0216	0.00672	0.0220	0.00686	0.0225	0.00700	0.0230	0.0108	0.0355	0.0110	0.0362
1750	0.00641	0.0210	0.00654	0.0214	0.00666	0.0218	0.00679	0.0223	0.0105	0.0345	0.0107	0.0352
1800	0.00623	0.0204	0.00635	0.0208	0.00648	0.0212	0.00661	0.0216	0.0102	0.0335	0.0104	0.0342
1900	0.00591	0.0194	0.00602	0.0198	0.00614	0.0201	0.00626	0.0205	0.00968	0.0317	0.00987	0.0323
2000	0.00561	0.0184	0.00572	0.0188	0.00583	0.0192	0.00595	0.0195	0.00919	0.0302	0.00937	0.0308

Table 30.9
Maximum direct-current resistance of ASTM Class I stranded conductors

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
10 AWG	1.04	3.41	1.06	3.48	1.08	3.55	1.10	3.62	–	–	–	–
9	0.824	2.70	0.840	2.75	0.857	2.82	0.874	2.87	–	–	–	–
8	0.654	2.14	0.666	2.18	0.679	2.23	0.693	2.27	1.07	3.52	1.09	3.59
7	0.518	1.70	0.528	1.73	0.538	1.76	0.550	1.81	0.850	2.78	0.867	2.85
6	0.419	1.38	0.427	1.41	0.436	1.43	0.445	1.46	0.687	2.25	0.701	2.31
5	0.333	1.09	0.339	1.11	0.346	1.13	0.353	1.15	0.545	1.79	0.556	1.83
4	0.263	0.865	0.268	0.881	0.274	0.900	0.279	0.917	0.432	1.42	0.441	1.45
3	0.209	0.686	0.213	0.700	0.217	0.713	0.221	0.727	0.343	1.12	0.350	1.14
2	0.166	0.544	0.169	0.555	0.172	0.566	0.175	0.576	0.271	0.891	0.277	0.910
1	0.132	0.431	0.134	0.440	0.137	0.449	0.140	0.457	0.215	0.707	0.220	0.721
1/0	0.105	0.345	0.107	0.352	0.109	0.359	0.111	0.366	0.172	0.566	0.175	0.577
2/0	0.0834	0.273	0.0851	0.279	0.0868	0.285	0.0885	0.291	0.137	0.449	0.140	0.458
3/0	0.0662	0.217	0.0675	0.221	0.0689	0.225	0.0702	0.231	0.108	0.356	0.111	0.363
4/0	0.0525	0.172	0.0536	0.175	0.0546	0.180	0.0557	0.183	0.0861	0.283	0.0878	0.288
250 kcmil	0.0449	0.147	0.0457	0.150	0.0466	0.153	0.0475	0.156	0.0735	0.242	0.0750	0.246
300	0.0373	0.122	0.0381	0.125	0.0389	0.128	0.0397	0.130	0.0613	0.201	0.0625	0.205
350	0.0320	0.105	0.0326	0.107	0.0334	0.109	0.0340	0.111	0.0525	0.172	0.0536	0.175
400	0.0280	0.0920	0.0286	0.0937	0.0292	0.0957	0.0297	0.0975	0.0460	0.151	0.0469	0.154
450	0.0249	0.0817	0.0254	0.0833	0.0259	0.0850	0.0264	0.0867	0.0408	0.134	0.0417	0.137
500	0.0224	0.0735	0.0228	0.0751	0.0234	0.0765	0.0238	0.0780	0.0367	0.120	0.0375	0.123
550	0.0204	0.0669	0.0208	0.0682	0.0212	0.0696	0.0216	0.0709	0.0335	0.110	0.0341	0.112
600	0.0187	0.0613	0.0191	0.0625	0.0195	0.0638	0.0198	0.0650	0.0306	0.100	0.0312	0.103
650	0.0174	0.0571	0.0177	0.0582	0.0182	0.0594	0.0185	0.0606	0.0286	0.0936	0.0292	0.0956
700	0.0162	0.0530	0.0165	0.0541	0.0168	0.0552	0.0171	0.0563	0.0265	0.0870	0.0270	0.0887

Table 30.9 Continued on Next Page

Table 30.9 Continued

Size of Conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)				Aluminum			
	20°C		25°C		20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
750 kcmil	0.0151	0.0495	0.0154	0.0505	0.0157	0.0515	0.0160	0.0525	0.0248	0.0812	0.0252	0.0828
800	0.0142	0.0464	0.0144	0.0473	0.0147	0.0482	0.0150	0.0493	0.0232	0.0761	0.0237	0.0776
900	0.0125	0.0413	0.0129	0.0420	0.0131	0.0429	0.0134	0.0438	0.0206	0.0676	0.0210	0.0691
1000	0.0113	0.0371	0.0115	0.0378	0.0117	0.0387	0.0120	0.0394	0.0186	0.0610	0.0190	0.0621
1100	0.0103	0.0338	0.0105	0.0344	0.0107	0.0351	0.0109	0.0358	0.0168	0.0554	0.0172	0.0565
1200	0.00944	0.0310	0.00962	0.0315	0.00981	0.0322	0.0101	0.0328	0.0155	0.0507	0.0158	0.0517
1250	0.00906	0.0297	0.00923	0.0303	0.00941	0.0310	0.00960	0.0315	0.0149	0.0487	0.0151	0.0497
1300	0.00871	0.0286	0.00887	0.0292	0.00906	0.0297	0.00923	0.0303	0.0143	0.0468	0.0146	0.0477
1400	0.00809	0.0265	0.00824	0.0270	0.00840	0.0275	0.00858	0.0282	0.0133	0.0435	0.0136	0.0444
1500	0.00755	0.0248	0.00769	0.0252	0.00784	0.0257	0.00801	0.0262	0.0123	0.0406	0.0126	0.0414
1600	0.00708	0.0233	0.00721	0.0237	0.00735	0.0242	0.00750	0.0246	0.0116	0.0380	0.0118	0.0389
1700	0.00666	0.0218	0.00679	0.0222	0.00693	0.0227	0.00706	0.0232	0.0109	0.0358	0.0111	0.0365
1750	0.00647	0.0212	0.00660	0.0216	0.00672	0.0220	0.00685	0.0225	0.0106	0.0348	0.0108	0.0355
1800	0.00629	0.0206	0.00642	0.0210	0.00654	0.0214	0.00667	0.0218	0.0103	0.0339	0.0105	0.0345
1900	0.00596	0.0196	0.00608	0.0199	0.00619	0.0203	0.00631	0.0207	0.00977	0.0320	0.00997	0.0326
2000	0.00566	0.0186	0.00577	0.0190	0.00589	0.0193	0.00600	0.0197	0.00928	0.0304	0.00947	0.0310

Table 30.10
Maximum direct-current resistance of ASTM Class K stranded conductors

Size of conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)			
	20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
14 AWG	2.62	8.61	2.67	8.78	2.82	9.25	2.88	9.42
13	2.08	6.84	2.12	6.97	2.23	7.34	2.28	7.48
12	1.65	5.43	1.68	5.53	1.77	5.82	1.81	5.94
11	1.31	4.30	1.33	4.39	1.40	4.61	1.44	4.71
10	1.04	3.41	1.06	3.48	1.11	3.66	1.14	3.73
9	0.840	2.75	0.857	2.82	0.903	2.96	0.920	3.02
8	0.666	2.18	0.679	2.23	0.715	2.35	0.729	2.40
7	0.528	1.73	0.539	1.76	0.567	1.87	0.578	1.90
6	0.419	1.38	0.427	1.41	0.450	1.48	0.459	1.51
5	0.333	1.09	0.339	1.11	0.357	1.17	0.364	1.19
4	0.263	0.865	0.268	0.881	0.283	0.928	0.289	0.947
3	0.211	0.693	0.215	0.706	0.226	0.744	0.232	0.758
2	0.167	0.549	0.170	0.560	0.180	0.590	0.184	0.601
1	0.133	0.436	0.136	0.444	0.143	0.467	0.145	0.476
1/0	0.105	0.345	0.107	0.352	0.113	0.370	0.115	0.377
2/0	0.0843	0.276	0.0859	0.282	0.0904	0.297	0.0922	0.303
3/0	0.0668	0.219	0.0681	0.223	0.0717	0.236	0.0731	0.240
4/0	0.0530	0.173	0.0541	0.177	0.0569	0.187	0.0580	0.191
250 kcmil	0.0449	0.147	0.0457	0.150	0.0481	0.158	0.0491	0.161
300	0.0373	0.122	0.0381	0.125	0.0401	0.132	0.0409	0.135
350	0.0323	0.106	0.0329	0.108	0.0347	0.114	0.0354	0.116
400	0.0283	0.0928	0.0289	0.0947	0.0304	0.0997	0.0310	0.102
450	0.0252	0.0825	0.0256	0.0842	0.0270	0.0886	0.0275	0.0904
500	0.0226	0.0743	0.0231	0.0757	0.0243	0.0798	0.0248	0.0813
550	0.0206	0.0675	0.0210	0.0688	0.0221	0.0725	0.0225	0.0740
600	0.0189	0.0619	0.0193	0.0631	0.0203	0.0664	0.0207	0.0677
650	0.0174	0.0571	0.0177	0.0582	0.0187	0.0613	0.0191	0.0625
700	0.0162	0.0530	0.0165	0.0541	0.0173	0.0569	0.0177	0.0580
750	0.0151	0.0495	0.0154	0.0505	0.0162	0.0531	0.0165	0.0542
800	0.0142	0.0464	0.0144	0.0473	0.0152	0.0499	0.0155	0.0508
900	0.0125	0.0413	0.0129	0.0420	0.0135	0.0443	0.0138	0.0452
1000	0.0113	0.0371	0.0115	0.0378	0.0121	0.0399	0.0124	0.0407

Table 30.11
Maximum direct-current resistance of ASTM Class M stranded conductors

Size of conductor	Uncoated copper				Coated copper (each strand coated with tin or a tin/lead alloy)			
	20°C		25°C		20°C		25°C	
	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m	Ohms per 1000 feet	Ohms per 1000 m
14 AWG	2.62	8.61	2.67	8.78	2.82	9.25	2.88	9.42
13	2.10	6.89	2.13	7.03	2.26	7.40	2.31	7.54
12	1.68	5.53	1.71	5.64	1.81	5.94	1.85	6.05
11	1.33	4.39	1.36	4.47	1.44	4.71	1.46	4.79
10	1.06	3.48	1.08	3.55	1.14	3.73	1.16	3.80
9	0.840	2.75	0.857	2.82	0.898	2.96	0.920	3.02
8	0.666	2.18	0.679	2.23	0.715	2.35	0.729	2.40
7	0.533	1.75	0.544	1.78	0.572	1.88	0.584	1.92
6	0.423	1.39	0.431	1.42	0.455	1.49	0.463	1.52
5	0.336	1.10	0.343	1.12	0.360	1.18	0.367	1.20
4	0.266	0.873	0.271	0.887	0.286	0.937	0.292	0.956
3	0.213	0.699	0.217	0.704	0.226	0.744	0.232	0.758
2	0.169	0.554	0.172	0.565	0.182	0.595	0.185	0.607
1	0.134	0.440	0.137	0.448	0.144	0.472	0.147	0.481
1/0	0.106	0.349	0.108	0.355	0.114	0.374	0.116	0.381
2/0	0.0851	0.276	0.0867	0.282	0.0913	0.300	0.0931	0.305
3/0	0.0674	0.221	0.0687	0.225	0.0724	0.238	0.0738	0.242
4/0	0.0534	0.175	0.0546	0.179	0.0574	0.189	0.0585	0.192
250 kcmil	0.0453	0.149	0.0462	0.151	0.0487	0.159	0.0496	0.162
300	0.0377	0.123	0.0385	0.125	0.0405	0.133	0.0413	0.136
350	0.0323	0.106	0.0329	0.108	0.0347	0.114	0.0354	0.116
400l	0.0283	0.0928	0.0289	0.0947	0.0304	0.0997	0.0310	0.102
450	0.0252	0.0825	0.0256	0.0842	0.0261	0.0858	0.0267	0.0875
500	0.0226	0.0743	0.0231	0.0757	0.0243	0.0798	0.0248	0.0813
550	0.0206	0.0675	0.0210	0.0688	0.0221	0.0725	0.0225	0.0740
600	0.0189	0.0619	0.0193	0.0631	0.0203	0.0664	0.0206	0.0677
650	0.0174	0.0571	0.0177	0.0582	0.0187	0.0613	0.0191	0.0625
700	0.0162	0.0530	0.0165	0.0541	0.0173	0.0569	0.0177	0.0580
750	0.0151	0.0495	0.0154	0.0505	0.0162	0.0531	0.0165	0.0542
800	0.0142	0.0464	0.0144	0.0473	0.0152	0.0499	0.0155	0.0508
900	0.0125	0.0413	0.0129	0.0420	0.0135	0.0443	0.0138	0.0452
1000	0.0113	0.0371	0.0115	0.0378	0.0121	0.0399	0.0123	0.0407