



Standard Practice for Selection of Wire and Cable Size in AWG or Metric Units¹

This standard is issued under the fixed designation F 1883; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This practice is intended as a guide to shipbuilders, shipowners, and design agents for use in the selection of conductor size for single conductor or multiple conductor cable sizes either in American Wire Gauge (AWG) or metric designations for commercial ship design and construction.

1.2 The comparison chart of electrical conductor sizes shown in Table 1 presents a combined listing of international standard sizes of annealed copper conductors in accordance with AWG (Specification B 8) English units or IEC (IEC 228) metric units.

1.3 As a precautionary caveat, some conductor sizes listed in Table 1 may exceed minimal size requirements of the U.S. Coast Guard, the American Bureau of Shipping, and IEEE STD 45 for specific applications.

1.4 The values stated for ampacity and dc resistance are presented as typical values and are provided for information only.

TABLE 1 Conversion Table—AWG/Metric Preferred Sizes of Conductors

Size Metric, mm ²	Size AWG/MCM	Area in Circ Mils (Nominal)	Ampacity ^A	dc Resistances at 20°C ^B	
				Ohms per 1000 ft	Ohms per km
	2000* ^C	2 000 000	1155	0.0053	0.0174
1000*		1 970 000	1145	0.0054	0.0176
	1750*	1 750 000	1070	0.0063	0.0199
800*		1 580 000	1009	0.0067	0.0218
	1500*	1 500 000	980	0.0071	0.0232
	1250*	1 250 000	890	0.0085	0.0278
630*		1 240 000	886	0.0096	0.0280
	1000*	1 000 000	780	0.0106	0.0347
500*		987 000	772	0.0105	0.0347
400*		789 000	675	0.0133	0.0438
	750*	750 000	655	0.0141	0.0463
	600*	600 000	575	0.0176	0.0578
300*		592 000	570	0.0211	0.0580
	500*	500 000	515	0.0211	0.0694
240*		474 000	499	0.0219	0.0720
	400*	400 000	455	0.0264	0.0867
185*		365 000	431	0.0286	0.0938
	350*	350 000	420	0.0302	0.0990
	300*	300 000	375	0.0353	0.1157

¹ This specification is under the jurisdiction of ASTM Committee F-25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.10 on Electrical.

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TABLE 1 Continued

Size Metric, mm ²	Size AWG/MCM	Area in Circ Mils (Nominal)	Ampacity ^A	dc Resistances at 20°C ^B	
				Ohms per 1000 ft	Ohms per km
150*		296 000	372	0.0353	0.1157
	250*	250 000	340	0.0423	0.1388
120*		237 000	327	0.0436	0.1492
	4/0*	211 600	300	0.0500	0.1639
95*		187 000	265	0.0551	0.1808
	3/0*	167 000	260	0.0631	0.2065
70*		138 000	230	0.0752	0.2467
	2/0*	133 100	225	0.0794	0.2605
	1/0*	105 600	195	0.1002	0.3288
50*		98 000	185	0.1044	0.3424
	1	83 690	165	0.1261	0.4139
35*		69 100	144	0.1495	0.4904
	2*	66 360	140	0.1588	0.5211
	3	52 620	120	0.2005	0.6577
25*		49 300	115	0.2057	0.6748
	4*	41 740	105	0.2528	0.8295
16*		31 600	89	0.3259	1.069
	6*	26 240	80	0.4023	1.320
10*		19 700	63	0.5167	1.695
	8*	16 510	55	0.6380	2.093
6.0*		11 800	43	0.8543	2.803
	10*	10 380	40	1.017	3.335
	4.0*	7 890	30	1.304	4.277
	12*	6 530	25	1.620	5.315
	2.5*	4 930	22	2.067	6.782
	14*	4 110	20	2.573	8.442
	1.5*	2 960	...	3.417	11.21
	16*	2 580	...	4.020	13.19
	1.0*	1 970	...	5.213	17.11
	0.90	1 773	...	6.45	21.10
	18*	1 620	...	6.82	20.95
	0.80	1 576	...	6.52	21.40
	0.75*	1 480	...	6.82	22.37
	0.60*	1 182	...	9.5	31.16
	20*	1 020	...	10.5	34.45
	0.50*	987	...	11.4	37.40
	22*	640	...	16.9	55.44
	0.20*	404	...	26.7	87.60
	24*	404	...	26.7	87.60
	26*	253	...	43.6	143.04

^AAmpacity of single-conductor cable in air at ambient temperature of 30°C and maximum conductor temperature not exceeding 60°C.

^BTemperature correction: the conductor resistance may be corrected for moderate temperature differences from the noted reference temperature by the following equation. The parameter, αT , varies with conductivity and temperature. For a list of common temperature coefficients see Test Methods B 193.

$$R_T = R_t [1 + \alpha_T (t - T)] \quad (1)$$

where:

R_T = resistance at reference temperature T ,

R_t = resistance as measured at temperature t ,

α_T = known or given temperature coefficient of resistance of the conductor being measured at reference temperature T . At 20°C, the value is 0.003 93,