Installation and Engineering Information

Proper Splices
While it is true that no splice is as good as a new cable, the use of quality materials and proven techniques can dramatically improve the service life of the cable splice. A well-made splice has the following characteristics:

1. High tensile strength — the splice cannot be easily pulled in two
2. Balanced conductors — equal tension on each conductor
3. Small outside diameter — the splice can be passed easily through existing cable guides
4. Low electrical resistance
5. Adequate insulation
6. High resistance to fatigue
7. A covering that is capable of keeping moisture from entering the cable interior

Shielding
Remember that an ungrounded shield is dangerous and should be treated as an energized conductor. The shield must be grounded at least at one end and preferably at two or more locations. It is recommended that shields be grounded at all cable terminations and splices. Stress cones should be installed at all high-voltage shield terminations.

Working Tension
The maximum working tension per conductor should not exceed 10 percent of the rated conductor strength. To determine the approximate tensile strength of the cable, multiply the total power conductor area (in^2) by 30,000 psi.

Bending Radius
The recommended Insulated Cable Engineers Association (ICEA) minimum bending radii are as follows:

- Braid-shielded portable cables — 8 times the cable diameter
- Non-shielded portable cables — 6 times the cable diameter
- Flat non-shielded cables — 6 times the minor dimension
- Copper tape-shielded cables — 12 times the cable diameter

AMPACITY CORRECTION FACTORS
APPROXIMATE FOR ALL CABLE VOLTAGES

Correction factors are listed below for various ambient temperatures.

AMBIENT TEMPERATURE	CORRECTION FACTORS FOR INSULATIONS RATED AT:
˚C	90˚C
10	1.26
20	1.18
30	1.10
40	1.00
50	0.90

When cables are used with one or more layers wound on a reel, the ampacities should be derated as follows:

NUMBER OF LAYERS	MULTIPLY AMPACITIES BY
1	0.85
2	0.65
3	0.45
4	0.35

VOLTAGE DROP
Approximate for all cable voltages—three conductor cables

90˚C			
60-CYCLE PHASE-TO-PHASE VOLTAGE DROP PER AMPERE PER 1,000 FT AT POWER FACTORS OF:			
CONDUCTOR SIZE (AWG or kcmil)	80%	90%	100%
6	0.82	0.90	0.95
4	0.54	0.58	0.60
2	0.35	0.38	0.38
1	0.29	0.31	0.30
1/0	0.24	0.25	0.24
2/0	0.20	0.20	0.19
3/0	0.16	0.17	0.15
4/0	0.14	0.14	0.12
250	0.12	0.12	0.10
300	0.11	0.11	0.08
350	0.10	0.09	0.07
400	0.09	0.08	0.06
500	0.08	0.07	0.05

Installation and Engineering Information & AWG-to-Metric Conversion Chart

AMPACITIES FOR PORTABLE POWER CABLES, AMPERES PER CONDUCTOR

POWER CONDUCTOR SIZE	SINGLE CONDUCTOR				TWO CONDUCTOR ROUND AND FLAT	THREE CONDUCTOR ROUND AND FLAT	THREE CONDUCTOR ROUND			FOUR CONDUCTOR	FIVE CONDUCTOR	SIX CONDUCTOR
AWG or kcmil	0-2000 VOLTS NONSHIELDED	2001-8000 VOLTS* SHIELDED	8001-15000 VOLTS* SHIELDED	15001-25000 VOLTS* SHIELDED	0-2000 VOLTS	0-5000 VOLTS NON-SHIELDED	0-8000 VOLTS SHIELDED	8001-15000 VOLTS SHIELDED	15001-25000 VOLTS SHIELDED	0-2000 VOLTS	0-2000 VOLTS	0-2000 VOLTS
8	83	-	-	-	72	59	-	-	-	54	50	48
6	109	112	-	-	95	79	93	-	-	72	68	64
4	145	148	-	-	127	104	122	-	-	93	88	83
3	167	171	-	-	145	120	140	-	-	106	100	95
2	192	195	195	-	167	138	159	164	178	122	116	110
1	223	225	225	222	191	161	184	187	191	143	136	129
1/0	258	260	259	255	217	186	211	215	218	165	-	-
2/0	298	299	298	293	250	215	243	246	249	192	-	-
3/0	345	345	343	337	286	249	279	283	286	221	-	-
4/0	400	400	397	389	328	287	321	325	327	255	-	-
250	445	444	440	430	363	320	355	359	360	280	-	-
300	500	496	491	480	400	357	398	-	-	310	-	-
350	552	549	543	529	436	394	435	-	-	335	-	-
400	600	596	590	572	470	430	470	-	-	356	-	-
450	650	640	633	615	497	460	503	-	-	377	-	-
500	695	688	678	659	524	487	536	-	-	395	-	-
550	737	732	-	-	-	-	-	-	-	-	-	-
600	780	779	-	-	-	-	-	-	-	-	-	-
650	820	817	-	-	-	-	-	-	-	-	-	-
700	855	845	-	-	-	-	-	-	-	-	-	-
750	898	889	-	-	-	-	-	-	-	-	-	-
800	925	925	-	-	-	-	-	-	-	-	-	-
900	1010	998	-	-	-	-	-	-	-	-	-	-
1000	1076	1061	-	-	-	-	-	-	-	-	-	-

*These ampacities are based on a single isolated cable in air, operated with an open-circuited shield.

NOTE – These ampacities are based on a conductor temperature of 90˚C and an ambient air temperature of 40˚C.

AWG-TO-METRIC CONVERSION CHART

SIZE (AWG)	mm^2	SIZE (AWG or kcmil)	mm^2
18	0.82	1/0	53.5
16	1.31	2/0	64.4
14	2.08	3/0	85.0
12	3.31	4/0	107.0
10	5.26	250	127.0
9	6.63	300	152.0
8	8.37	350	177.0
6	13.30	500	253.0
4	21.15	600	304.0
2	33.62	750	380.0
1	42.40	1000	507.0