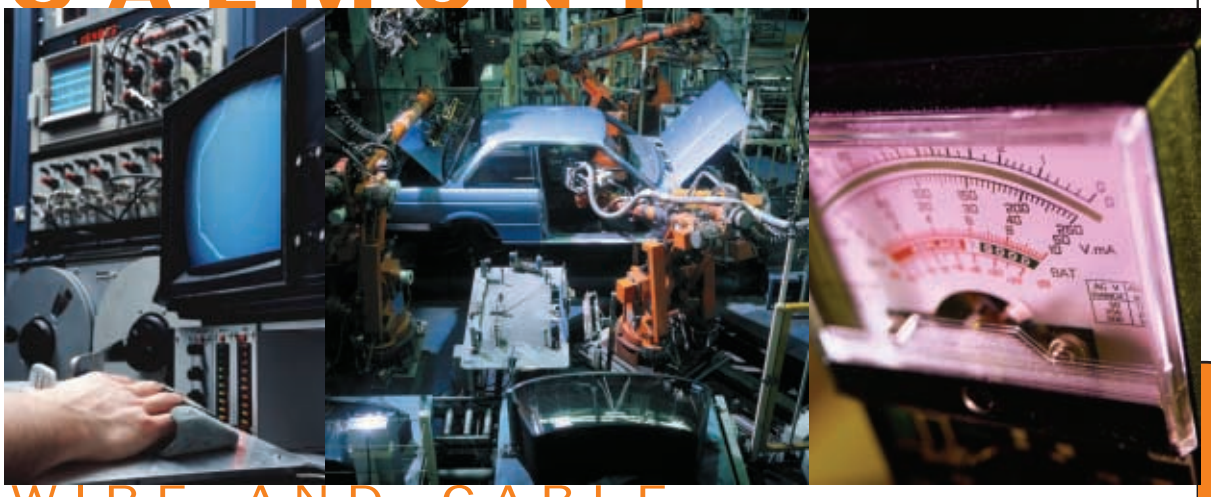
CALMONT



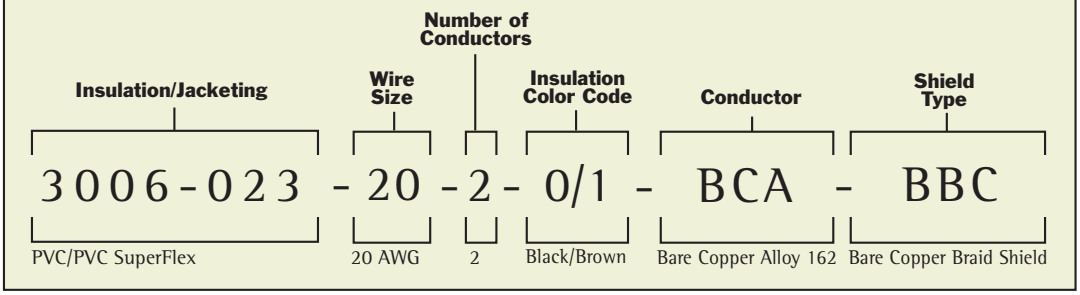
WIRE AND CABLE

Technical Reference

Calmont WIRE AND CABLE, INC.

How To Order Calmont High Flex Products

SAMPLE ORDERING NUMBER



CALMONT HIGH FLEX CABLE OPTIONS

Part #	Insulation/Jacketing	-A WIRE SIZE AWG	-N NUMBER OF CONDUCTORS	-C PRIMARY INSULATION COLORS	-CCC CONDUCTOR TYPE ABBREVIATION	DESCRIPTION	-S SHELD STYLE
3006-023	PVC/PVC	20 AWG through 40 AWG	Customer to specify.	Per MIL-STD-6	BC	Bare Copper	U = No Shield
3006-031	PVC/TPE				BCA	Bare Copper Alloy 162	BC
3006-051	PVC/PU			0 = Black	BCW	Bare CopperWeld	BCA
3006-024	FEP/FEP			1 = Brown	BPB	Bare Phosphor Bronze	Bronze
3006-029	FEP/SILICONE			2 = Red	CON	Constantan	BCW
3006-032	FEP/TPE			3 = Orange	HIP	High Permeable Iron	HIP
3006-052	FEP/PU			4 = Yellow	KN	Alumel	LOP
3006-028	SILICONE/SILICONE			5 = Green	KP	Chromel	NIC
3006-026	SILICONE/FEP			6 = Blue	LOP	Low Permeable Iron	NPA
3006-034	SILICONE/TPE			7 = Violet	NIC	Nickel	NPC
				8 = Grey	NPA	Nickel plated Alloy 135	SCW
				9 = White	NPC	Nickel plated Copper	SPA
					SCW	Silver plated CopperWeld	SPC
					SPA	Silver plated alloy 135	SPCS95
					SPC	Silver plated Copper	SS
					SPCS95	Silver plated Alloy CS-95	TC
					SS	Stainless Steel	TCA
					TC	Tin plated Copper	TCW
					TCA	Tin plated Alloy 162	
					TCW	Tin plated CopperWeld	

(B) Braid Shield
(S) Spiral Shield

Color Code Chart No. 1

Cond.	Color
1	Black
2	White
3	Red
4	Green
5	Brown
6	Blue
7	Orange
8	Yellow
9	Violet
10	Gray
11	Pink
12	Tan

Color Code Chart No.2

Cond.	Color	Cond.	Color	Cond.	Color	Cond.	Color
1	Black	14	Green/White	27	Blue/White/Black	40	Red/White/Green
2	White	15	Blue/White	28	Black/Red Green	41	Green/White/Blue
3	Red	16	Black/Red	29	White/Red/Green	42	Orange/Red/Green
4	Green	17	White/Red	30	Red/Black/Green	43	Blue/Red/Green
5	Brown	18	Orange/Red	31	Green/Black/Orange	44	Black/White/Blue
6	Blue	19	Blue/Red	32	Orange/Black/Green	45	White/Black/Blue
7	White/Black	20	Red/Green	33	Blue/White/Orange	46	Red/White/Blue
8	Red/Black	21	Orange/Green	34	Black/White/Orange	47	Green/Orange/Red
9	Green/Black	22	Black/White/Red	35	White/Red/Orange	48	Orange/Red/Blue
10	Orange/Black	23	White/Black/Red	36	Orange/White/Blue	49	Blue/Orange/Red
11	Blue/Black	24	Red/Black/White	37	White/Red/Blue	50	Black/Orange/Red
12	Black/White	25	Green/Black/White	38	Black/White/Green		
13	Red/White	26	Orange/Black/White	39	White/Black/Green		

Color Code Chart No.3 for Paired Cables

Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination
1	Black & Red	11	Red & Yellow	21	White & Brown	31	Violet & White
2	Black & White	12	Red & Brown	22	White & Orange	32	Violet & Dark Green
3	Black & Green	13	Red & Orange	23	Blue & Yellow	33	Violet & Light Blue
4	Black & Blue	14	Green & White	24	Blue & Brown	34	Violet & Yellow
5	Black & Yellow	15	Green & Blue	25	Blue & Orange	35	Violet & Brown
6	Black & Brown	16	Green & Yellow	26	Violet & Black	36	Violet & Black
7	Black & Orange	17	Green & Brown	27	Brown & Orange	37	Gray & White
8	Red & White	18	Green & Orange	28	Orange & Yellow		
9	Red & Green	19	White & Blue	29	Violet & Orange		
10	Red & Blue	20	White & Yellow	30	Violet & Red		

Color Code Chart No.4 for Paired Cables

Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination
1	White & Blue	6	Red & Blue	11	Black & Blue	16	Violet & Blue	21	Violet & Blue
2	White & Orange	7	Red & Orange	12	Black & Orange	17	Violet & Dark Green	22	Violet & Orange
3	White & Green	8	Red & Green	13	Black & Green	18	Yellow & Green	23	Violet & Green
4	White & Blue	9	Red & Brown	14	Black & Brown	19	Yellow & Brown	24	Violet & Brown
5	White & Slate	10	Red & Slate	15	Black & Slate	20	Yellow & Slate	25	Violet & Slate

Color Code Chart No.5 for Paired Cables (Western Electric Standard)

Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination
1	White/Blue Stripe Blue/White Stripe	6	Red/Blue Stripe Blue/Red Stripe	11	Black/Blue Stripe Blue/Black Stripe	16	Yellow/Blue Stripe Blue/Yellow Stripe	21	Violet/Blue Stripe Blue/Violet Stripe
2	White/Orange Stripe Orange/White Stripe	7	Red/Orange Stripe Orange/Red Stripe	12	Black/Orange Stripe Orange/Black Stripe	17	Yellow/Orange Stripe Orange/Yellow Stripe	22	Violet/Orange Stripe Orange/Violet Stripe
3	White/Green Stripe Green/White Stripe	8	Red/Green Stripe Green/Red Stripe	13	Black/Green Stripe Green/Black Stripe	18	Yellow/Green Stripe Green/Yellow Stripe	23	Violet/Green Stripe Green/Violet Stripe
4	White/Brown Stripe Brown/White Stripe	9	Red/Brown Stripe Brown/Red Stripe	14	Black/Brown Stripe Brown/Black Stripe	19	Yellow/Brown Stripe Brown/Yellow Stripe	24	Violet/Brown Stripe Brown/Yellow Stripe
5	White/Gray Stripe Gray/White Stripe	10	Red/Gray Stripe Gray/Red Stripe	15	Black/Gray Stripe Gray/Black Stripe	20	Yellow/Gray Stripe Gray/Yellow Stripe	25	Violet/Gray Stripe Gray/Violet Stripe

Calmont WIRE AND CABLE, INC.

Wire Charts

Solid and Stranded Conductor AWG Chart

AWG Size	Total Strands/ Strand Size	Type	Construction	Nominal Diameter		Circular Area		Approximate Weight		Nom. Break Strength		Maximum DC Resistance	
				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
56	1	S	Solid	0.00049	0.0124	0.24	0.00012	0.00070	0.001	0.0066	0.00	46949	154039
54	1	S	Solid	0.00062	0.0157	0.38	0.00020	0.0012	0.002	0.011	0.00	28808	94520
52	1	S	Solid	0.00078	0.0198	0.61	0.00031	0.0018	0.003	0.017	0.01	18437	60493
50	1	S	Solid	0.00099	0.0251	0.98	0.00050	0.0030	0.005	0.027	0.01	11491	37703
48	1	S	Solid	0.00124	0.0315	1.54	0.00078	0.0047	0.007	0.042	0.02	7324	24029
46	1	S	Solid	0.00157	0.0399	2.46	0.0012	0.0075	0.011	0.068	0.03	4548	14924
44	1	S	Solid	0.00200	0.0508	4.00	0.0020	0.0121	0.018	0.11	0.05	2873	9426
42	1	S	Solid	0.00250	0.0635	6.25	0.0032	0.0189	0.028	0.17	0.08	1801	5908
42	7/50	C	7/50	0.00300	0.0762	6.86	0.0035	0.0216	0.032	0.19	0.09	1891	5548
40	1	S	Solid	0.00310	0.0787	9.61	0.0049	0.0291	0.043	0.26	0.12	1152	3781
40	7/48	C	7/48	0.00370	0.0940	10.80	0.0055	0.0339	0.050	0.30	0.13	1078	3536
40	10/50	B	10/50	0.00360	0.0914	9.80	0.0050	0.0306	0.046	0.27	0.12	1172	3846
39	1	S	Solid	0.00350	0.0889	12.30	0.0062	0.0371	0.055	0.34	0.15	897	2944
38	1	S	Solid	0.00400	0.102	16.00	0.0081	0.0484	0.072	0.44	0.20	682	2237
38	7/46	C	7/46	0.00470	0.119	17.30	0.0087	0.0541	0.081	0.47	0.22	669	2196
38	10/48	B	10/48	0.00450	0.114	15.40	0.0078	0.0479	0.071	0.42	0.19	747	2451
38	16/50	B	16/50	0.00460	0.117	15.70	0.0080	0.0490	0.073	0.43	0.20	733	2404
36	1	S	Solid	0.0050	0.127	25.00	0.013	0.0757	0.11	0.69	0.31	432	1417
36	7/44	C	7/44	0.0060	0.152	28.00	0.014	0.0872	0.13	0.77	0.35	423	1387
36	10/46	B	10/46	0.0057	0.145	24.60	0.012	0.0765	0.11	0.68	0.31	464	1522
36	16/48	B	16/48	0.0057	0.145	24.60	0.012	0.0767	0.11	0.68	0.31	467	1532
36	19/48	C	19/48	0.0062	0.157	29.20	0.015	0.0920	0.14	0.80	0.36	397	1303
36	25/50	B	25/50	0.0057	0.145	24.50	0.012	0.0765	0.11	0.67	0.31	469	1538
34	1	S	Solid	0.0063	0.160	39.70	0.020	0.120	0.18	1.1	0.50	270	885
34	7/42	C	7/42	0.0075	0.191	43.80	0.022	0.136	0.20	1.2	0.55	265	869
34	10/44	B	10/44	0.0073	0.185	40.00	0.020	0.123	0.18	1.1	0.50	293	961
34	16/46	B	16/46	0.0073	0.185	39.40	0.020	0.122	0.18	1.1	0.49	290	951
34	19/46	C	19/46	0.0079	0.201	46.80	0.024	0.147	0.22	1.3	0.58	247	809
34	25/48	B	25/48	0.0072	0.183	38.40	0.019	0.120	0.18	1.1	0.48	299	980
34	40/50	B	40/50	0.0072	0.183	39.20	0.020	0.122	0.18	1.1	0.49	293	961
32	1	S	Solid	0.0080	0.203	64.00	0.032	0.194	0.29	1.8	0.80	166	545
32	7/40	C	7/40	0.0093	0.236	67.30	0.034	0.210	0.31	1.9	0.84	170	556
32	10/42	B	10/42	0.0091	0.231	62.50	0.032	0.193	0.29	1.7	0.78	184	603
32	16/44	B	16/44	0.0092	0.234	64.00	0.032	0.197	0.29	1.8	0.80	183	601
32	19/44	C	19/44	0.0100	0.254	76.00	0.039	0.237	0.35	2.1	0.95	156	511
32	25/46	B	25/46	0.0091	0.231	61.60	0.031	0.190	0.29	1.7	0.77	186	609
32	64/50	B	64/50	0.0091	0.231	62.10	0.032	0.196	0.29	1.7	0.78	183	601
30	1	S	Solid	0.0100	0.254	100.00	0.051	0.303	0.45	2.8	1.25	106	347
30	7/38	C	7/38	0.0120	0.305	112.00	0.057	0.349	0.52	3.1	1.40	100	329
30	10/40	B	10/40	0.0113	0.287	96.10	0.049	0.297	0.44	2.6	1.20	118	386
30	16/42	B	16/42	0.0116	0.295	100.00	0.051	0.308	0.46	2.8	1.25	115	377
30	19/42	C	19/42	0.0125	0.318	119.00	0.060	0.370	0.55	3.3	1.48	97.6	320
30	25/44	B	25/44	0.0116	0.295	100.00	0.051	0.309	0.46	2.8	1.25	117	385
30	40/46	B	40/46	0.0115	0.292	98.60	0.050	0.306	0.46	2.7	1.23	116	381
29	1	S	Solid	0.0113	0.287	128.00	0.065	0.387	0.58	3.5	1.59	82.7	271
29	51/46	B	51/46	0.0129	0.328	126.00	0.064	0.390	0.58	3.5	1.57	91.0	299

B – Bunch stranded wire. Wires are twisted without a geometric relationship to each other.

C – Concentric stranded wire. Each layer of the stranding has all strands in the same direction and position.

RB – Rope construction with Bunch stranded groups. Similar to concentric for the groups of strands.

RC – Rope construction with Concentric stranded groups. Similar to concentric stranding for both the final stranding and each group.

S – Solid wires.

The maximum resistance values are for the wire as a single conductor. Additional allowances have to be made when the wires are cabled into a multiconductor cable.

Wire Charts

Solid and Stranded Conductor AWG Chart

AWG Size	Total Strands/ Strand Size	Type	Construction	Nominal Diameter		Circular Area		Approximate Weight		Nom. Break Strength		Maximum DC Resistance	
				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
28	1	S	Solid	0.0126	0.320	159	0.080	0.481	0.72	4.4	1.98	66.4	218
28	7/36	C	7/36	0.0150	0.381	175	0.089	0.546	0.81	4.8	2.18	63.6	209
28	19/40	C	19/40	0.0155	0.394	183	0.093	0.569	0.85	5.0	2.28	62.5	205
28	26/42	B	26/42	0.0147	0.373	163	0.082	0.501	0.75	4.5	2.03	70.6	232
28	36/44	RB	2 x 18/44	0.0141	0.358	144	0.073	0.467	0.69	4.0	1.80	85.5	280
28	40/44	B	40/44	0.0146	0.371	160	0.081	0.494	0.74	4.4	2.00	73.3	240
28	65/46	B	65/46	0.0146	0.371	160	0.081	0.497	0.74	4.4	2.00	71.4	234
28	66/46	RB	3 x 22/46	0.0188	0.478	163	0.082	0.530	0.79	4.5	2.03	73.8	242
26	1	S	Solid	0.0159	0.404	253	0.13	0.765	1.1	7.0	3.15	42.1	138
26	7/34	C	7/34	0.0189	0.480	278	0.14	0.866	1.3	7.6	3.46	39.7	130
26	10/36	B	10/36	0.0183	0.465	250	0.13	0.772	1.2	6.9	3.12	44.1	145
26	19/38	C	19/38	0.0200	0.508	304	0.15	0.947	1.4	8.4	3.79	37.0	121
26	26/40	B	26/40	0.0183	0.465	250	0.13	0.772	1.2	6.9	3.12	45.2	148
26	28/40	RB	7 x 4/40	0.0208	0.528	269	0.14	0.873	1.3	7.4	3.36	44.1	145
26	41/42	B	41/42	0.0185	0.470	256	0.13	0.790	1.2	7.0	3.20	44.8	147
26	64/44	RB	4 x 16/44	0.0203	0.516	256	0.13	0.829	1.2	7.0	3.19	48.1	158
26	65/44	B	65/44	0.0186	0.472	260	0.13	0.802	1.2	7.2	3.24	45.1	148
26	66/44	RB	3 x 22/44	0.0206	0.523	264	0.13	0.855	1.3	7.3	3.29	46.6	153
26	105/46	RB	3 x 35/46	0.0204	0.518	259	0.13	0.843	1.3	7.1	3.23	46.4	152
24	1	S	Solid	0.0201	0.511	404	0.20	1.22	1.8	11.0	5.04	26.2	85.9
24	7/32	C	7/32	0.0240	0.610	448	0.23	1.40	2.1	12.3	5.59	24.5	80.2
24	10/34	B	10/34	0.0230	0.584	397	0.20	1.23	1.8	10.9	4.95	27.5	90.3
24	16/36	B	16/36	0.0231	0.587	400	0.20	1.24	1.8	11.0	4.99	27.5	90.4
24	19/36	C	19/36	0.0250	0.635	475	0.24	1.48	2.2	13.1	5.92	23.4	76.8
24	41/40	B	41/40	0.0229	0.582	394	0.20	1.22	1.8	10.8	4.91	28.7	94.1
24	42/40	B	42 /40	0.0232	0.589	404	0.20	1.25	1.9	11.1	5.03	28.0	91.8
24	65/42	B	65/42	0.0233	0.592	406	0.21	1.25	1.9	11.2	5.07	28.3	92.7
24	100/44	RB	2 x 50/44	0.0254	0.645	400	0.20	1.30	1.9	11.0	4.99	30.8	101
24	105/44	RB	3 x 35/44	0.0260	0.660	420	0.21	1.36	2.0	11.5	5.24	29.3	96.1
24	105/44	RB	7 x 15/44	0.0260	0.660	420	0.21	1.36	2.0	11.5	5.24	29.3	96.1
22	1	S	Solid	0.0253	0.643	640	0.32	1.94	2.9	17.6	7.98	16.6	54.4
22	7/30	C	7/30	0.0300	0.762	700	0.35	2.18	3.3	19.2	8.73	15.6	51.1
22	16/34	B	16/34	0.0291	0.739	635	0.32	1.96	2.9	17.5	7.92	17.2	56.4
22	19/34	C	9/34	0.0315	0.800	754	0.38	2.35	3.5	20.7	9.40	14.6	48.0
22	26/36	B	26/36	0.0294	0.747	650	0.33	2.01	3.0	17.9	8.10	17.0	55.6
22	66/40	B	66/40	0.0291	0.739	634	0.32	1.96	2.9	17.4	7.91	17.8	58.4
22	66/40	RB	2 x 33/40	0.0320	0.813	634	0.32	2.06	1.1	17.4	7.91	18.7	61.4
22	66/40	RB	3 x 22/40	0.0320	0.813	634	0.33	2.06	3.1	17.4	7.91	18.7	61.4
22	150/44	RB	3 x 50/44	0.0311	0.790	600	0.30	1.94	2.9	16.5	7.48	20.5	67.3
22	154/44	RB	7 x 22/44	0.0315	0.800	616	0.31	2.00	3.0	16.9	7.68	20.0	65.6
22	168/44	RB	7 x 24/44	0.0329	0.836	672	0.34	2.18	3.2	18.5	8.38	18.3	60.1
20	1	S	Solid	0.0320	0.813	1024	0.52	3.10	4.6	28.1	12.80	10.3	33.9
20	7/28	C	7/28	0.0378	0.960	1111	0.56	3.32	5.2	30.5	13.90	9.77	32.0
20	10/30	B	10/30	0.0365	0.927	1000	0.51	3.09	4.6	27.5	12.50	10.8	35.4
20	19/32	C	19/32	0.0400	1.016	1216	0.62	3.79	5.6	33.4	15.20	9.01	29.6

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Calmont WIRE AND CABLE, INC.

Wire Charts

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				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
20	20/33	B	20/33	0.0367	0.932	1008	0.51	3.11	4.6	27.7	32.00	10.8	35.4
20	26/34	B	26/34	0.0371	0.942	1032	0.52	3.19	4.7	28.4	12.90	10.6	34.7
20	41/36	B	41/36	0.0370	0.940	1025	0.52	3.17	4.7	28.2	12.80	10.8	35.3
20	42/36	RB	7 x 6/36	0.0412	1.046	1050	0.53	3.41	5.1	28.9	33.10	11.0	36.1
20	65/38	B	65/38	0.0372	0.945	1040	0.53	3.21	1.8	28.6	33.00	10.7	35.1
20	104/40	B	104/40	0.0365	0.927	999	0.51	3.09	4.6	27.5	32.50	11.3	37.1
20	105/40	RB	7 x 15/40	0.0404	1.026	1909	0.51	3.27	4.9	27.7	12.60	11.8	38.5
20	154/42	RB	7 x 22/42	0.0394	1.001	963	0.49	3.12	4.0	26.5	2.00	12.5	41.1
20	266/44	RB	7 x 38/44	0.0414	1.05	1004	0.54	3.45	5.1	29.2	13.30	11.6	38.0
18	1	S	Solid	0.0403	1.02	1624	0.82	4.92	7.3	44.6	20.30	6.51	21.4
18	7/26	C	7/26	0.0477	1.21	1770	0.90	5.52	8.2	48.6	22.10	6.19	20.3
18	10/28	B	10/28	0.0460	1.17	1588	0.80	4.90	7.3	43.6	19.80	6.77	22.2
18	16/30	B	16/30	0.0462	1.17	1600	0.81	4.94	7.4	44.0	20.00	6.75	22.1
18	19/30	C	19/30	0.0500	1.27	1900	0.96	5.92	8.8	52.2	23.70	5.74	18.8
18	32/33	B	32/33	0.0464	1.18	1613	0.82	4.98	7.4	44.3	20.10	6.75	22.1
18	41/34	B	41/34	0.0466	1.18	1627	0.82	5.02	7.5	44.7	20.30	6.71	22.0
18	63/36	RB	7 x 9/36	0.0504	1.28	1575	0.80	5.11	7.6	43.3	19.60	7.34	24.1
18	65/36	B	65/36	0.0466	1.18	1625	0.82	5.02	7.5	44.7	20.30	6.78	22.2
18	105/38	RB	7x 15/38	0.0521	1.32	1680	0.85	5.44	8.1	46.2	20.90	6.96	22.8
18	168/40	RB	7 x 24/40	0.0510	1.30	1615	0.84	5.24	7.8	44.4	20.10	7.35	24.1
18	259/42	RB	7 x 37/42	0.0511	1.30	1619	0.82	5.24	7.8	44.5	20.20	7.45	24.4
18	413/44	RB	7 x 59/44	0.0516	1.31	1652	0.84	5.35	8.0	45.4	20.60	7.45	24.4
16	1	S	Solid	0.0508	1.29	2581	1.31	7.81	11.6	70.9	32.20	4.10	13.5
16	7/24	C	7/24	0.0603	1.53	2828	1.43	8.82	13.1	71.7	35.30	3.85	12.6
16	16/28	B	16/28	0.0582	1.48	2540	1.29	7.84	11.7	69.8	31.70	4.23	33.9
16	19/29	C	19/29	0.0565	1.44	2426	1.23	7.56	11.3	66.7	30.30	4.48	14.7
16	26/30	B	26/30	0.0589	1.50	2600	1.32	8.03	11.9	71.5	32.40	4.15	33.6
16	40/32	B	40/32	0.0584	1.48	2560	1.30	7.90	11.8	70.4	31.90	4.24	13.9
16	42/32	RB	7 x 6/32	0.0659	1.67	2688	1.36	8.71	13.0	73.9	33.50	4.24	13.9
16	50/33	B	50/33	0.0580	1.47	2521	1.28	7.78	11.6	69.3	31.40	4.32	14.2
16	65/34	B	65/34	0.0587	1.49	2580	1.31	7.96	11.8	70.9	32.20	4.23	13.9
16	105/36	B	105/36	0.0592	1.50	2625	1.33	8.11	12.1	72.2	32.70	4.20	13.8
16	105/36	RB	7 x 15/36	0.0651	1.65	2625	1.33	8.51	12.7	72.2	32.70	4.41	14.5
16	168/38	RB	7 x 24/38	0.0659	1.67	2688	1.36	8.71	13.0	73.9	33.50	4.35	14.3
16	259/40	RB	7 x 37/40	0.0634	1.61	2489	1.26	8.07	12.0	68.4	31.00	4.77	15.6
16	264/40	RB	4 x 66/40	0.0640	1.63	2537	1.29	8.23	12.2	69.7	31.60	4.68	15.3
16	280/40	RB	7 x 40/40	0.0659	1.67	2691	1.36	8.73	13.0	74.0	33.60	4.41	14.5
16	665/44	RB	7 x 95/44	0.0655	1.66	2660	1.35	8.62	12.8	73.1	33.20	4.63	15.2
16	714/44	RB	7 x 3 x 34/44	0.0741	1.88	2856	1.45	9.72	14.5	78.5	35.60	4.53	14.9
14	1	S	Solid	0.0641	1.63	4109	2.08	10.9	16.2	91.4	41.50	3.51	11.5
14	7/22	C	7/22	0.0759	1.93	4461	2.27	14.0	20.8	123.0	55.90	2.44	8.01
14	7/22	C	7/22	0.0759	1.93	4481	2.27	11.9	17.7	101.0	45.80	3.15	10.3
14	19/27	C	19/27	0.0710	1.80	3831	1.94	10.9	16.2	92.5	41.90	3.53	11.6
14	19/27	C	19/27	0.0710	1.80	3831	1.94	11.9	17.8	105.0	47.80	2.83	9.28
14	26/28	B	26/28	0.0742	1.88	4128	2.09	12.7	19.0	113.0	51.50	2.60	8.54
14	26/28	B	26/28	0.0742	1.88	4128	2.09	11.5	17.1	93.0	42.20	3.68	12.1

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Wire Charts

Solid and Stranded Conductor AWG Chart

AWG Size	Total Strands/ Strand Size	Type	Construction	Nominal Diameter		Circular Area		Approximate Weight		Nom. Break Strength		Maximum DC Resistance	
				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
14	37/30	C	37/30	0.0700	1.78	3700	1.88	11.5	17.2	102	46.10	2.95	9.69
14	37/30	C	37/30	0.0700	1.78	3700	1.88	11.3	16.9	96.2	43.60	3.44	11.30
14	41/30	B	41/30	0.0740	1.88	4100	2.08	12.7	18.8	113.0	51.10	2.63	8.64
14	42/30	RB	7x6/30	0.0823	2.09	4200	2.13	13.6	20.3	115.0	52.40	2.70	8.85
14	49/30	RC	7x7/30	0.0900	2.29	4900	2.48	16.0	23.9	135.0	61.10	2.34	7.66
14	105/34	RB	7x15/34	0.0820	2.08	4168	2.11	13.5	20.1	115.0	52.00	2.75	9.03
14	105/34	B	105/34	0.0746	1.89	4168	2.11	12.9	19.1	115.0	52.00	2.62	8.60
14	168/36	RB	7x24/36	0.0823	2.09	4200	2.13	13.6	20.3	115.0	52.40	2.75	9.04
14	266/38	RB	7x38/38	0.0829	2.11	4256	2.16	13.8	20.5	117.0	53.10	2.75	9.01
14	413/40	RB	7x59/40	0.0800	2.03	3969	2.01	12.9	19.2	109.0	49.50	2.99	9.50
14	441/40	RB	7x3x 21/40	0.0902	2.29	4238	2.15	14.4	21.5	116.0	52.80	2.94	9.64
14	462/40	RB	7x66/40	0.0847	2.15	4440	2.25	14.4	21.4	122.0	55.40	2.67	8.77
14	665/42	RB	7x95/42	0.0819	2.08	4156	2.11	13.5	20.0	114.0	51.80	2.90	9.51
14	1050/44	RB	7x3x50/44	0.0898	2.28	4200	2.13	14.3	21.3	115.0	52.40	3.08	10.10
14	1078/44	RB	7x7x22/44	0.0910	2.31	4312	2.19	14.7	21.8	119.0	53.80	3.00	9.83
14	1176/44	RB	7x3x56/44	0.0951	2.42	4704	2.38	16.0	23.8	129.0	58.70	2.75	9.01
8	1	S	Solid	0.129	3.26	16512	8.37	50.0	74.4	454.0	206.00	0.64	2.10
8	7/16	C	7/16	0.152	3.87	18064	9.15	56.3	83.8	497.0	225.00	0.60	1.98
8	19/21	C	19/21	0.143	3.62	15433	7.82	48.1	71.6	424.0	192.00	0.71	2.32
8	37/24	C	37/24	0.141	3.57	14948	7.58	46.6	69.4	411.0	186.00	0.73	2.39
8	49/25	RC	7x7/25	0.161	4.09	15760	7.96	51.4	76.5	432.0	196.00	0.73	2.40
8	133/29	RB	7x19/29	0.170	4.31	16983	8.61	55.6	82.7	467.0	212.00	0.87	2.21
8	133/29	RC	19x7/29	0.170	4.31	16983	8.61	58.4	86.9	467.0	212.00	0.71	2.32
8	152/30	RB	19x8/30	0.157	3.98	15200	7.70	51.7	77.0	418.0	190.00	0.78	2.57
8	168/30	RB	7x24/30	0.165	4.18	16800	8.51	54.5	81.0	462.0	209.00	0.67	2.21
8	245/32	RB	7x35/32	0.159	4.04	15680	7.95	50.8	75.6	431.0	196.00	0.73	2.38
8	301/33	RB	7x43/33	0.157	3.98	15173	7.69	49.2	73.2	417.0	189.00	0.75	2.47
8	413/34	RB	7x59/34	0.163	4.13	16392	8.31	53.1	79.0	451.0	204.00	0.70	2.30
8	602/36	RB	7x86/36	0.156	3.96	15050	7.63	48.8	72.6	414.0	188.00	0.77	2.52
8	665/35	RB	7x95/36	0.164	4.16	16625	8.43	53.9	80.2	457.0	207.00	0.70	2.28
8	1050/38	RB	7x150/38	0.165	4.18	16800	8.51	54.4	81.0	462.0	209.00	0.70	2.28
8	1666/40	RB	7x7x34/40	0.175	4.46	16010	8.11	54.5	81.1	440.0	200.00	0.78	2.55
8	1715/40	RB	7x7x35/40	0.178	4.52	16481	8.35	56.1	83.5	453.0	206.00	0.76	2.48
6	1	S	Solid	0.162	4.11	26244	13.30	79.4	118.0	721.0	327.00	0.40	1.32
6	7/14	C	7/14	0.192	4.88	28762	14.60	89.7	131.0	791.0	359.00	0.38	1.24
6	19/19	C	19/19	0.180	4.56	24487	12.40	76.3	114.0	673.0	305.00	0.45	1.46
6	37/22	C	37/22	0.186	4.72	23683	12.00	73.9	110.0	651.0	295.00	0.46	1.52
6	49/23	RC	7x7/23	0.203	5.17	25027	12.70	81.9	122.0	688.0	312.00	0.46	1.50
6	133/27	RB	7x19/27	0.213	5.41	26818	13.60	87.8	131.0	737.0	334.00	0.42	1.39
6	133/27	RC	19x7/27	0.213	5.41	26818	13.60	92.2	137.0	737.0	334.00	0.45	1.46
6	259/30	RB	7x37/30	0.205	5.19	25900	13.10	84.0	125.0	712.0	323.00	0.44	1.44
6	427/32	RB	7x61/32	0.210	5.33	27328	13.90	88.6	132.0	751.0	341.00	0.42	1.37
6	665/34	RB	19x35/34	0.206	5.24	26394	13.40	89.8	134.0	726.0	329.00	0.46	1.50
6	665/34	RB	7x95/34	0.206	5.24	26394	13.40	85.5	127.0	726.0	329.00	0.43	1.43
6	1050/36	RB	7x150/36	0.206	5.23	26250	13.30	85.1	127.0	722.0	327.00	0.44	1.45
6	1078/36	RB	7x7x22/36	0.228	5.78	26950	13.70	91.8	137.0	741.0	336.00	0.45	1.48

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Calmont WIRE AND CABLE, INC.

Wire Charts

Solid and Stranded Conductor AWG Chart

AWG Size	Total Strands/ Strand Size	Type	Construction	Nominal Diameter		Circular Area		Approximate Weight		Nom. Break Strength		Maximum DC Resistance	
				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
6	1666/38	RB	7x238/38	0.207	5.27	26656	13.5	86.4	129	733	332.00	0.44	1.44
6	1813/38	RB	7x7x37/38	0.236	6.00	29008	14.7	98.7	147	797	362.00	0.42	1.39
6	2744/40	RB	7x7x56/40	0.225	5.72	26370	13.4	89.8	134	725	329.00	0.47	1.55
6	6517/44	RB	7x7x19/44	0.224	5.68	26068	13.2	89.5	133	717	325.00	0.50	1.64
4	7/12	C	7/12	0.242	6.16	45700	23.2	142	212	1256	570.00	0.24	0.78
4	19/17	C	19/17	0.227	5.75	38990	19.8	122	181	1072	486.00	0.28	0.92
4	37/20	C	37/20	0.224	5.69	37888	19.2	118	176	1042	472.00	0.29	0.94
4	49/21	RC	7x7/21	0.257	6.52	39800	20.2	130	194	1094	496.00	0.29	0.94
4	61/22	C	61/22	0.228	5.78	39045	19.8	121	179	1073	487.00	0.28	0.91
4	133/25	RC	19x7/25	0.269	6.82	42615	21.6	146	218	1171	531.00	0.28	0.93
4	133/25	RC	7x19/25	0.269	6.82	42615	21.6	140	208	1171	531.00	0.27	0.88
4	259/28	RB	7x37/28	0.258	6.54	41119	20.8	133	198	1130	513.00	0.27	0.90
4	259/28	RC	37x7/28	0.265	6.72	41119	20.8	141	210	1130	513.00	0.29	0.95
4	413/30	RB	7x59/30	0.258	6.56	41300	20.9	134	199	1135	515.00	0.27	0.90
4	437/30	RB	19x23/30	0.266	6.75	43700	22.1	149	221	1201	545.00	0.27	0.89
4	1050/34	RB	7x3x50/34	0.283	7.19	41675	21.1	142	211	1146	520.00	0.29	0.95
4	1064/34	RB	19x56/34	0.261	6.63	42230	21.4	144	214	1161	527.00	0.29	0.94
4	1078/34	RB	7x7x22/34	0.287	7.28	42786	21.7	146	217	1176	533.00	0.28	0.92
4	1666/36	RB	7x7x34/36	0.283	7.19	41650	21.1	142	211	1145	519.00	0.29	0.96
4	1672/36	RB	19x88/36	0.260	6.60	41800	21.2	142	212	1149	521.00	0.29	0.95
4	1813/36	RB	7x7x37/36	0.295	7.50	45325	23.0	154	230	1246	565.00	0.27	0.88
3	7/11	C	7/11	0.272	6.91	57585	29.2	180	267	1583	718.00	0.19	0.62
3	19/16	C	19/16	0.254	6.45	49032	24.9	153	227	1348	611.00	0.22	0.73
3	37/19	C	37/19	0.251	6.38	47686	24.2	149	221	1311	595.00	0.23	0.75
3	61/21	C	61/21	0.257	6.52	49547	25.1	154	230	1362	618.00	0.22	0.72
2	7/10	C	7/10	0.306	7.76	72585	36.8	227	337	1998	906.00	0.15	0.49
2	19/15	C	19/15	0.286	7.25	61948	31.4	193	287	1703	772.00	0.18	0.58
2	37/18	C	37/18	0.282	7.17	60091	30.5	187	279	1652	749.00	0.18	0.60
2	49/19	RC	7x7/19	0.323	8.21	63152	32.0	207	308	1736	787.00	0.18	0.60
2	61/20	C	61/20	0.288	7.32	82464	31.7	195	290	1717	779.00	0.17	0.57
2	133/23	RC	7x19/23	0.339	8.61	67931	34.4	222	331	1867	847.00	0.17	0.55
2	133/23	RC	19x7/23	0.339	8.61	67931	34.4	233	347	1867	847.00	0.18	0.58
2	259/26	RB	7x37/26	0.325	8.26	65478	33.2	212	316	1800	816.00	0.17	0.57
2	259/26	RC	37x7/26	0.334	8.48	65478	33.2	225	335	1800	816.00	0.18	0.61
2	637/30	RB	7x7x13/30	0.350	8.88	63700	32.3	217	323	1751	794.00	0.19	0.61
2	665/30	RB	19x35/30	0.328	8.32	66500	33.7	226	337	1828	829.00	0.18	0.59
2	665/30	RB	7x95/30	0.328	8.32	66500	33.7	216	321	1828	829.00	0.17	0.56
2	1666/34	RB	7x7x34/34	0.356	9.05	66124	33.5	225	335	1818	824.00	0.18	0.60
2	2646/36	RB	7x7x54/36	0.357	9.06	66150	33.5	225	335	1818	825.00	0.18	0.60
2	2891/36	RB	7x7x59/36	0.373	9.46	72275	36.6	246	366	1987	901.00	0.17	0.55
2/0	37/15	C	37/15	0.400	10.15	120635	61.1	376	560	3316	1504.00	0.09	0.30
2/0	61/17	C	61/17	0.457	11.61	157419	79.8	191	730	4327	1963.00	0.07	0.23
2/0	133/20	RC	19x7/20	0.480	12.19	136192	69.0	468	697	3714	1698.00	0.09	0.29
2/0	133/20	RC	7x19/20	0.480	12.19	136192	69.0	446	664	3744	1698.00	0.08	0.28
2/0	259/23	RB	7x37/23	0.462	11.74	132287	67.0	429	638	3636	1649.00	0.09	0.28
2/0	259/23	RC	37x7/23	0.475	12.05	132287	87.0	155	677	3636	1649.00	0.09	0.30

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				Inches	mm	Mils	mm2	Lbs/ 1000'	Kg/ Km	Lbs	Kg	Ohms/ 1,000'	Ohms/ Km
2/0	427/25	RB	7x61/25	0.470	11.94	136815	69.3	444	660	3761	1706.00	0.08	0.27
2/0	427/25	RC	61x7/25	0.483	12.28	136815	69.3	470	700	3761	1706.00	0.09	0.29
2/0	1323/30	RB	7x7x27/30	0.504	12.80	132300	67.0	450	670	3637	1650.00	0.09	0.30
2/0	1330/30	RB	19x70/30	0.463	11.77	133000	67.4	453	674	3656	1658.00	0.09	0.29
2/0	3325/34	RB	19x7x25/34	0.525	13.32	131969	66.9	472	702	3628	1646.00	0.10	0.31
2/0	3332/34	RB	7x7x68/34	0.504	12.80	132247	67.0	450	670	3635	1649.00	0.09	0.30
2/0	5292/36	RB	7x7x108/36	0.504	12.80	132300	67.0	450	670	3637	1650.00	0.09	0.30
4/0	37/13	C	37/13	0.504	12.80	191808	97.2	598	890	5273	2392.00	0.06	0.19
4/0	61/15	C	61/15	0.514	13.05	198885	100.8	620	923	5467	2480.00	0.05	0.18
4/0	133/18	RC	7x19/18	0.605	15.35	216004	109.5	707	1050	5938	2693.00	0.05	0.17
4/0	133/18	RC	19x7/18	0.605	15.35	216004	109.5	742	1100	5938	2693.00	0.06	0.18
4/0	259/21	RB	7x 7/21	0.583	14.80	210373	106.6	682	1010	5783	2623.00	0.05	0.18
4/0	259/21	RC	37x7/21	0.599	15.20	210373	106.6	723	1080	5783	2623.00	0.06	0.19
4/0	427/23	RC	61x7/23	0.610	15.50	218095	110.5	750	1120	5995	2719.00	0.05	0.18
4/0	427/23	RB	7x61/23	0.593	15.07	218095	110.5	707	1050	5995	2719.00	0.05	0.17
4/0	2107/30	RB	7x7x43/30	0.636	16.16	210700	106.8	717	1070	5792	2627.00	0.06	0.14
4/0	2109/30	RB	37x57/30	0.584	14.82	210900	106.9	718	1068	5797	2630.00	0.06	0.19
4/0	5320/24	RB	19x7x40/34	0.663	16.85	211151	107.0	754	1120	5804	2633.00	0.06	0.20
4/0	8512/36	RB	19x7x64/36	0.666	16.92	212800	107.8	761	1130	5650	2653.00	0.06	0.20

B – Bunch stranded wire. Wires are twisted without a geometric relationship to each other.

C – Concentric stranded wire. Each layer of the stranding has all strands in the same direction and position.

RB – Rope construction with Bunch stranded groups. Similar to concentric for the groups of strands.

RC – Rope construction with Concentric stranded groups. Similar to concentric stranding for both the final stranding and each group.

S – Solid wires.

The maximum resistance values are for the wire as a single conductor. Additional allowances have to be made when the wires are cabled into a multiconductor cable.

Unit Conversions Chart

Measurement (Notation) Area	To Convert To	Multiply By
Square Mils (mil², sq mils)	Circular Mils	1.2732
Square Mils (mil², sq mils)	Square Inches	10^{-6}
Circular Mils (cir. mil, CMA)	Square Inches	.7854
Circular Mils (cir. mil, CMA)	Square Mils	7.854×10^{-7}
Circular Mils (cir. mil, CMA)	Circular Inches	10^{-6}
Circular Mils (cir. mil, CMA)	Square Mils	.0005067
Square Inches (in², sq mils)	Square Mils	1,000,000
Square Inches (in², sq. in)	Circular Mils	1,273,200
Square Inches (in², sq. in)	Circular Inches	1.2732
Square Inches (in², sq. in)	Square Mils	645.2
Square Inches (in², sq. in)	Square Centimeters	6.542
Circular Inches (cir. in)	Circular Mils	1,000,000
Circular Inches (cir. in)	Square Inches	.7854
Square Feet (ft²,sq. ft.)	Square Meters	.09290
Square Millimeters (mm², sq.mm)	Circular Mils	1,973.5
Square Millimeters (mm², sq. mm)	Square Inches	.0015500
Square Meters (m²)	Square Feet	10.764
Weight/Mass/Force		
Newtons (N)	Pounds	.2248
Newtons (N)	Kilograms	.102
Ounces (oz.)	Grams (g)	28.3495
Pounds (lb, #)	Kilograms	.4536
Kilograms (kg)	Pounds	2.2046
Pressure		
Pounds per Square Inch (lb/in²,psi	Kilograms per Square Centimeter	.07031
Pounds per Square Inch (lb/in²,psi)	Pounds per Square Feet	144
Pounds Per Square Foot (lb/ft²)	Pascals (Pa. N/m²)	47.88029
Pounds Per Square Foot (lb/ft²)	Kilograms per Square Meter (Kg/m²)	4.882401
Pounds Per Square Foot (lb/ft²)	Atmospheres (Atm)	4.7254×10^{4}
Kilograms per Square Centimeters (kg/cm²)	Pounds per Square Inch	14.223
Density		
Pounds per 1000 Feet (lbs/M')	Kilograms per Kilometer	1.488
Kilograms per Kilometer (kg/km)	Pounds per 1000 Feet	.6720
Ohms per 1000 Feet (Ω/M')	Ohms per Kilometer	3.281
Ohms per Kilometer(Ω/km)	Ohms per 1000 Feet	.3048
Temperature °F	Temperature °C	5/9 (°F-32°)
Temperature °C	Temperature °F	(9/5 x °C)+32°

High Performance Conductor Options

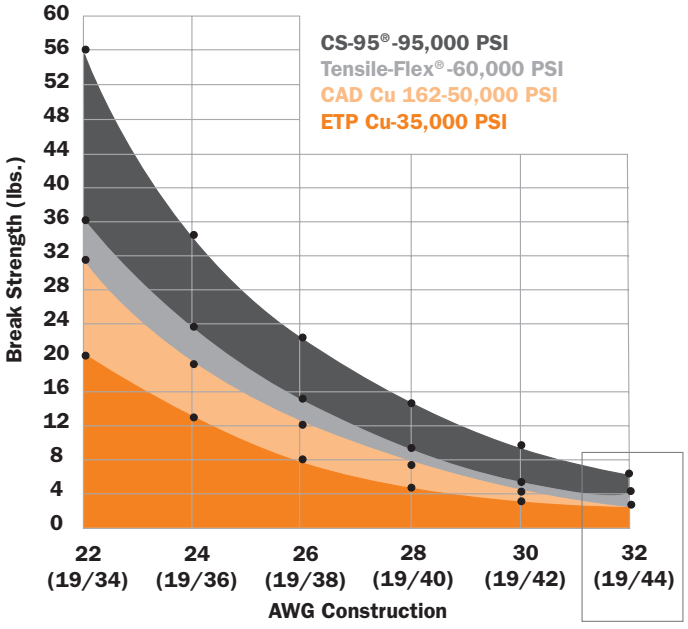
Base Material	Alloy No.	Properties[1]					Size and Coating[2]				
							AWG Size Range		Coatings		
		Tensile Strength (PSI)		Elong.[3] (Annealed)	Cond. % IACS	Density (LBS/CU. INCH)	Single Strand	Stranded	Tin	Silver	Nickel
		Annealed	Hard								
Copper											
ETP	C11000	35,000	68,000	25	100	0.322	14 to 56	4/0 to 36	•	•	•
OF	C10200	35,000	68,000	25	100	0.322	14 to 56	4/0 to 36	•	•	•
OF w/Silver	C10700	35,000	68,000	25	100	0.322	14 to 56	4/0 to 36	•	•	•
High Strength CS-95®	–	95,000	130,000	6	63	0.319	24 to 56	24 to 56		•	•
Tensile-Flex®[4]	C18135	60,000	120,000	8	90	0.322	18 to 52	4 to 24	•	•	•
Zr Copper	C15000	36,000	70,000	25	90	0.322	18 to 40	14 - 30		•	•
CT37™	–	50,000	95,000	8	80	0.322	18 to 48	4/0 to 42		•	•
CC78™	–	50,000	85,000	8	90	0.321	18 to 48	4/0 to 42		•	
Cd Copper	C16200	50,000	110,000	8	90	0.231	14 to 40	4 to 36	•	•	•
Cd Copper	C16500	45,000	95,000	25	60	0.321	14 to 40		•	•	•
Copper Clad Steel											
CLASS 30	–	60,000	127,000	15	30	0.294	18 to 40	10 to 30	•	•	•
CLASS 40	–	55,000	110,000	15	40	0.294	18 to 40	10 to 30	•	•	•
CLASS 60	–	45,000	90,000	20	60	0.294	20 to 40	10 to 30	•	•	•
CLASS 70	–	40,000	80,000	20	70	0.294	20 to 44	10 to 30	•	•	•
Brass											
70/30	C26000	60,000	130,000	30	27	0.308	27	0.308			
80/20	C24000	55,000	125,000	30	32	0.313	18 to 40				
85/15	C23000	48,000	105,000	30	36	0.316	18 to 40				
87/13	C22600	45,000	97,000	30	40	0.317	18 to 40				
90/10	C22000	45,000	90,000	30	43	0.318	18 to 40				
95/5	C21000	45,000	65,000	30	56	0.320	18 to 40				
Silicon Bronze											
Low (B) 1015	C65100	45,000	105,000	30	11	0.316	20 to 38				
High (A) 1010	C65500	60,000	145,000	30	7	0.308	20 to 38				
Phosphor Bronze											
95/5	C51000	57,000	140,000	35	15	0.320	20 to 40				
97/3	C50900	53,000	125,000	35	16	0.321	20 to 30				
92/8	C52100	70,000	150,000	50	12	0.318	20 to 40				
Nickel Silver											
10%	C74500	700,000	105,000	25	8.4	0.310	16 to 40				
12%	C75700	70,000	93,000	25	7.7	0.310	16 to 40				
18%	C75200	70,000	103,000	25	6.2	0.316	16 to 40				
Aluminum											
EC	–	15,000	25,000	15	62	0.098	20 to 38	4/0 to 8			
5056	–	45,000	65,000	15	29	0.095	20 to 38				
Other											
Nickel	200	65,000	150,000	25	18	0.321	18 to 40				
CCAL	–	17,000	23,000	10	62	0.121	16 to 38	2 to 30		•	
Silver	–	18,000	55,000	30	108	0.379	16 to 40				
Steel	LC	55,000	110,000	20	13	0.284	22 to 38				•
Stainless Steel	304	125,000	250,000	30	2.3	0.286	30 to 50	18 to 42			

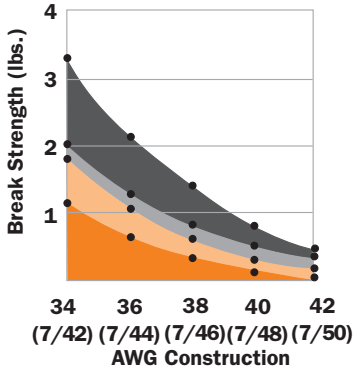
1. Physical properties are all nominal values and should not be used for specification purposes
2. Other sizes and constructions available upon request
3. Actual elongation will vary with size
4. Previously referred to as PD Alloy 135

CHART COURTESY OF PHELPS DODGE HIGH PERFORMANCE CONDUCTORS.

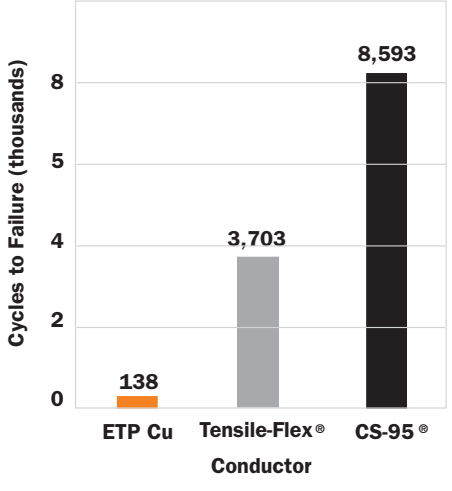
High Performance Alloys
PROPERTIES

Break Strength vs. Material at Decreasing Size





Flex Fatigue Life vs. Material (26 AWG 19/38)



Thermal Aging vs. Material

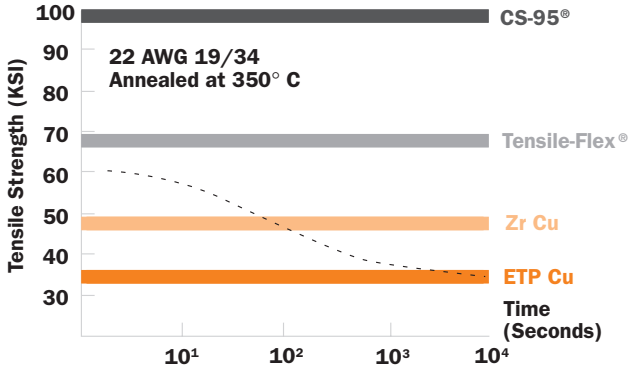


CHART COURTESY OF PHELPS DODGE HIGH PERFORMANCE CONDUCTORS.

Glossary of Terms Used in the Wire & Cable Industry

A	Ampere
Abrasion Resistance	A measure of the ability of a wire, wire covering or material to resist surface wear or damage by mechanical means.
Accelerated Aging Test	Test of insulation to measure its compliance with temperature ratings.
Alternating Current (AC)	Alternating Current
Ampere	The unit expressing the rate of flow of an electrical current.
Anneal	To heat and then gradually cool in order to relieve mechanical stresses. Annealing copper makes it softer and less brittle.
ASTM	American Society for Testing and Materials
Attenuation	Applied to coaxial cables, the signal loss in a cable, expressed in decibels, dB.
AWG	American Wire Gauge. The standard system used for designating wire diameter. Also referred to as the Brown and Sharp (B & S) wire gauge.
AWM	Underwriters Laboratories designation for Appliance Wiring Material.
Balanced Line	A cable having two conductors which carry voltages opposite in polarity but equal in magnitude with respect to ground.
Bare Conductor	A conductor not covered with insulating material.
Baud	Unit of data transmission speed. One Baud is one bit per second.
Binder	Spirally served tape or thread used for holding assembled cable components in place.
Bond Strength	Amount of adhesion between bonded surfaces.
Braid	Woven bare metallic or tinned copper wire used as shielding for wires and cables.
Braid Angle	The angle between the axis of the cable and axis of the braid.
Braid Ends	The number of wires used on one carrier on a braider.
Breakdown Voltage	The voltage at which the insulation between two conductors will break down or arc over.
B & S Gauge	Brown & Sharp Gauge, a wire diameter standard the same as AWG.
Bunched Stranding	A group of strands twisted together in a random manner in the same direction and done in one operation with no regard to geometric position of the strands.
C	Celsius. A temperature rating system where water freezes at zero degrees and boils at one hundred degrees.
Cable	A combination of conductors insulated from one another (multiple-conductor cable).
Cable Core	The portion of an insulated cable under the protective covering or coverings.
Cable Filler	The material used in multiple-conductor cables to occupy the interstices in a cable to make the finished cable round.
Cabling	Twisting together two or more insulated conductors by machine to form a cable.
Cabling Factor	Used in formulas for calculating the overall diameter of cable. D=fd where D=cable diameter, f=factor, and d=diameter of one conductor.
Capacitance	The ability of a cable to hold an electric charge. Its value is usually stated in Picofarads/foot.
Cellular Insulation	Insulation that has had an agent used to produce cells or "bubbles". Used to reduce the dielectric constant of the solid insulation.
Characteristic Impedance	Characteristic impedance of a cable is the ratio of an applied voltage and current. The value is expressed in Ohms.
Circular Mil Area (CMA)	The square of a conductor diameter in mils, or thousandths of an inch. Example a 30 AWG conductor has a diameter of 10 mils and a CMA of 100. Used to determine conductor sizes.

Glossary

Coaxial Cable	A cable consisting of a center conductor and a shield.
Cold Bend Test	Test to measure a cable's ability to withstand cold temperature.
Cold Flow	Permanent deformation of materials due to mechanical force or pressure (not due to heat softening).
Color Code	A color system for wire or circuit identification by use of solid colors, stripes, or surface printing.
Compound	An insulating or jacketing material.
Concentric Strand	A wire that consists of a central wire or core surrounded by one or more layers of spiral laid wires.
Concentricity	In a wire or cable, the measurement of the location of the center of the conductor with respect to the geometric center of the insulation. Expressed in percent.
Constantan	Constantan is an alloy used in making thermocouples wires. Constantan is an alloy of copper, nickel manganese, and iron.
Continuity Check	A test performed on finished wire or cable to determine if electrical current can flow continuously.
Copper	Copper is the most widely used electrical conductor in wires and cables. Some of the common types of electrical coppers and copper alloys are:

* Electrolytic tough pitch copper (ETPC) has a minimum copper content of 99.9%. Annealed conductivity averages 101% with a 100% minimum. It is widely used for wire and bus bars.

* Silver bearing copper with a 99.9% copper content provides nearly the same electrical conductivity as the ETP copper but offers a higher softening point, greater resistance to creep, and higher strength at elevated temperatures.

* Oxygen-free high-conductivity copper (OFHC) has 99.95% minimum copper content with an average annealed conductivity of 101%.

Copper-Covered Steel Wire	A wire having a steel core and an outer covering of copper.
Corona	A luminous discharge due to ionization of the gas surrounding a conductor.
Corona Resistance	The ability of an insulation to withstand a voltage without corona.
Coverage	The calculated percentage of braid shield that covers the underlying cable core.
CS-95	Phelps Dodge High Performance Conductors trade name for extra high strength copper alloy.
Crosstalk	Signal interference between nearby conductors caused by the pickup of stray energy.
CSA	Canadian Standards Association
Current Carrying Capacity	The maximum current a conductor can carry without heating beyond a safe limit.
Cut-Through Resistance	Resistance of insulation material to penetration by test blade under conditions of pressure, temperature, etc.
Cycle	The complete sequence including reversal of the flow of alternating electric current.
dB Loss	The loss of a signal in a conductor expressed in decibels.
Decibel (dB)	Unit to express differences of power level.
Denier	A term borrowed from the textile industry for sizing yarns. Denier is defined as the weight in grams of 9,000 yards of a yarn.
Dielectric Constant	The ratio of an insulations ability to hold a charge with respect to air. Expressed as a unitless number (i.e. 2.1).
Dielectric Strength	The voltage which an insulating material can withstand before breakdown occurs, usually expressed as a voltage gradient (such as volts per mil).
Dielectric Test	Test applying a voltage higher than the rated voltage for a specified time.
Direct Current (DC)	An electric current which flows in only one direction.
Direction of Lay	The lateral direction in which the conductors of a cable are wound.
Double Shield	Two shields, one over the other. Used to improve the shield effectiveness.
Drain Wire	In a cable an uninsulated wire laid over the component or components, usually under aluminized mylar and used for a ground connection.

Glossary

Drawing	In the manufacture of wire pulling the metal through a die or series of dies for reduction of diameter to a specified size.
Durometer	A measuring device used to denote the hardness of plastic. For most flexible plastics, the A or D scale is used.
Elastomer	A material which at room temperature stretches under low stress to at least twice its length and snaps back to original length upon release of stress.
Elongation	The fractional increase in length of a material stressed in tension.
Ends	The number of wires or threads on a braider carrier.
Etch	A process, using either chemicals or plasma which roughens the surface of a wire to assist in bonding to or marking the wire.
Extrusion	Method of forming plastic, rubber, or elastomer material to apply insulation or jackets to a conductor or cable.
Farad	Unit of Capacitance. For wire and cable a lesser unit of picofarads is used. One picofarad is one thousand millionths of a Farad.
Fatigue Resistance	Resistance to metal crystallization which leads to conductors or wires breaking from flexing.
FEP	Fluorinated Ethylene Propylene
Fiber	A thread or threadlike structure such as glass yarn.
Filler	Materials used in multi-conductor cables to occupy the interstices formed by the assembled conductors and to make the cable round.
Flame Resistance	Ability of the material to extinguish flame once the source of heat is removed.
Flat Braid	A woven braid which is rolled flat at time of manufacture to a specific width depending upon construction. It is used as a ground strap.
Flat Cable	Any cable with two smooth or corrugated but essentially flat surfaces.
Flat Conductor Cable	A cable with a plurality of flat conductors.
Flex Life	The number of cycles that a cable can withstand before failure when bent around a specific radius.
Foamed Plastics	Resins in flexible or rigid sponge formed with the cells closed or interconnected. Foamed insulations provide low dielectric constants and weight savings.
Gigahertz	A unit of frequency equal to one billion Hertz.
Gold	Used primarily as a coating or plating material because of its electrical properties.
GRND	Ground
Ground	An electrical term meaning to connect to the earth.
Heat Shock	Test to determine stability of a material by sudden exposure to a high temperature for a short period of time.
Henry	Unit of inductance. For wire and cable usually millihenries are specified. A millihenry is 1000th of a Henry.
Hertz (Hz)	A term replacing cycles-per-second as the unit of measure for frequency.
High Strength Alloy Conductor	A conductor which shows a maximum 20% increase in resistance and a minimum of a 70% increase in breaking strength over the equivalent construction in pure copper while exhibiting a minimum elongation of 5% in 10 inches.
High Voltage	Generally considered to be a wire or cable with an operating voltage of over 600 volts.
Hi-Pot	A test designed to determine the highest potential that can be applied to conductor without breaking through the insulation.
Hybrid Cable	Cable containing a mixture of conductors and fiber optics.
Impact Strength	Test for ascertaining the punishment a cable configuration can withstand without physical or electrical breakdown, by impacting with a given weight, dropped a given distance, in a controlled environment.

Glossary

Inductance	Inductance is measured in henries. A property of an electric circuit by which an electromotive force is induced in it by a variation of current either in the circuit itself or in a neighboring circuit.
Insulated Wire	A conductor of electricity covered with a nonconducting material.
IPCEA	Insulated Power and Cable Engineers Association
Iron-Constantan	A combination of metals used in thermocouples, thermocouple wires and thermocouple lead wires. Constantan is an alloy of copper, nickel, manganese, and iron. The iron wire is positive, the constantan negative.
Irradiation	The process of cross linking the insulation.
Jacket	A covering extruded over a cable core or shield.
Kapton	DuPont Company registered trademark for Polyimide film.
Kilovolt	1000 volts
Kilowatt	1000 watts
KYNAR	Registered trademark of Penwalt Corporation. Polyvinylidene fluoride (PVF2) is rated at 135°C.
Lacquer Finish	A finish applied over braided wire or cable for protection against fraying, wicking, moisture, absorption, abrasion, etc.
Lay	The twist of a cable. It is measured as the length along the cable of one turn of a conductor.
Limpness	The ability of a cable to lay flat or conform to a bend.
Line Voltage	The voltage at a wall outlet or other terminals of a power line system. The line voltage is usually 120 volts in the USA and 220 volts in Europe.
Litz Wire	Wire made from a number of fine, separately-insulated strands specially braided or woven together for reduced skin effect and hence lower resistance to high frequency currents for lower RF losses. The full name is Litzendraht Wire.
Low Noise Cable	Cable configuration specially constructed to eliminate spurious electrical disturbances caused by capacitance changes or self-generated triboelectric noise.
Marker Tape	A tape laid parallel to the conductors under the jacket in a cable, imprinted with manufacturer's name and/or specification to which the cable is made.
MCM	Thousand circular mils.
Mfd	Microfarad, one millionth of a farad, the unit of capacitance.
Microfarad	One millionth of a farad.
MIL	Military specifications for wire.
Mil	0.001" (1/1000 inch) one 1000th of an inch. A unit used in measuring diameter of wire or thickness of an insulation over a conductor.
Multi	1000 volts1000 volts
Conductor Cable	A combination of two or more conductors cabled together and insulated from one another and from sheath or armor where used.
NEC	National Electrical Code, which covers the use of wire and cable in many applications.
NEMA	National Electrical Manufacturers Association
Nylon	The generic name for synthetic fiber-forming polyamides. Available in two forms for wires and cables: as a yarn for wire serving and braid; as an extrusion material (primarily for jackets).
OD	Outside Diameter
Ohm	Unit of electrical resistance. Resistance of a circuit in which a potential difference of one volt produces a current of one ampere.
Percent Plating	Quantity of plating on a conductor expressed as percentage by weight; thus, for the same percentage, as the conductor diameter increases, so does the thickness of the plating.
Picks Per Inch	The number of times the carriers in a braid cross over each other in the same direction along the longitudinal axis for each inch of length.
Planetary Cabler	A cabling machine whose payoff spools are mounted in rotating cradles that hold the axis of the spool in a fixed direction as the spools are revolved about one another so the wire will not kink as it is twisted.

Glossary

Polyethylene	A thermoplastic material with a low dielectric constant. Usually used for coaxial cables. May be "foamed" to yield a dielectric constant between 1.4 and 1.6.
Polypropylene (PU)	A plastic, it is similar to polyethylene but stiffer.
Polyurethane	This plastic usually used as a jacketing material and offers good abrasion and is very flexible. Not normally used for insulation.
Polyvinyl Chloride (PVC)	A general thermoplastic material composed of polymers of vinyl chloride. PVC is widely used for primary wire insulation or jacketing.
Primary Insulation	An insulation material, applied over a conductor.
PTFE	Polytetrafluoroethylene
PVC	Polyvinyl chloride
Quad	A four conductor cable
Red Plague	A powdery brown-red oxide of silver formed with water or rocket fuel fumes. It is highly conductive and can flake off and cause shorts in electrical equipment.
Ribbon Cable	Flat cable with conductors that have been individually insulated together and "glued together".
RG/U	RG is the military designation for coaxial cable. The "U" stands for universal.
Semiconducting Jacket	A jacket having a sufficiently low resistance so that its outer surface can be kept at substantially ground potential by a grounded conductor placed under the jacket.
Serving	A wrapping applied over the core of a cable or over a wire. Servings may be in the form of filaments, fibers, yarn, tape, etc. Often referred to as a binder.
Sheath	The protective covering applied to cables. Also referred to as Jacket.
Shield	A metallic layer placed around an insulated conductor or group of conductors to prevent electrostatic or electromagnetic interference between the enclosed wires and external fields. This shield can be braided or served wires, foil wrap, foil backed tape, a metallic tube, or conductive material.
Shield Coverage	The amount of optical coverage, usually expressed in percentage. For most cables the value runs between 85% and 90%.
Silver	Silver is similar to gold in corrosion resistance. It costs less than other precious metals. It is very soft when fully annealed but work hardens during fabrication. It provides very good conductivity and solderability. It is widely used as plating or coating.
Solid Conductor	A conductor consisting of a single wire.
SPC	Silver plated copper
Spark Test	A test performed on wire and cable to determine the amount of pin holes or defects in the insulation.
Specific Gravity	The density (mass per unit volume) of any material divided by that of water at a standard temperature. Most insulations range in values of .9 to 1.9
Strand	One of the wires, or groups of wires, of any stranded conductor.
Stranded Conductor	A conductor composed of a group of wires, or of any combination of groups of wires. (Note: The wires in a stranded conductor are usually twisted or braided together.)
Strip	To remove insulation from a wire.
Surface Resistivity	The resistance of a material between two opposite sides of a unit square of its surface. Surface resistivity may vary widely with the conditions of measurement.
Teflon FEP	Registered trademark of the DuPont Company. Fluorinated ethylene propylene (FEP). A 200°C rated Fluoropolymer that can be used for insulation and jacket applications.
Teflon PFA	Registered trademark of the DuPont Company. Perfluooalkoxy (PFA). A 250°C rated Fluoropolymer that can be used for insulation and jacket applications.
Teflon TFE	Registered trademark of the DuPont Company. Tetrafluoroethylene (TFE). A 260°C rated Fluoropolymer that can be used for insulation and jacket applications.

Glossary

Tefzel	Registered trademark of the DuPont Company. Ethylene tetrafluoroethylene (ETFE), is a 150°C rated Fluoropolymer that can be used for insulation and jacket applications.
Temperature Rating	The maximum temperature at which the insulating material may be used in continuous operation with a loss of 50% of its original properties.
Tensile-Flex	Trademark for Phelps Dodge Alloy 135 high strength copper alloy.
Tinned Wire	Copper wire that has been coated with a layer of tin or solder to facilitates soldering.
Tinsel Wire	A low voltage, stranded wire where each strand is a very thin conductor ribbon spirally wrapped around a textile yarn.
Tolerance	A specified allowance for deviation from a standard dimension, weight, or property.
Triboelectric Noise	Noise generated in a shielded cable due to movement between the components as the cable is flexed.
Twisted Pair	A cable composed of two insulated conductors, twisted together without a common covering.
UHF	Ultra High Frequency
UL	Underwriters Laboratories, Inc.
Unbalanced Line	A transmission line in which voltages on the two conductors are unequal with respect to ground. An example is coaxial cable.
Unidirectional Concentric Stranding	A stranding where each successive layer has a different lay length, thereby retaining a circular form without migration of strands from one layer to another.
Unidirectional Stranding	A term denoting that in a stranded conductor all layers have the same direction of lay.
Unilay Strand	A conductor constructed with a central core surrounded by more than one layer of helically-laid wires, with all layers having a common length and direction of lay.
Velocity of Propagation	The transmission speed of an electrical signal down a length of cable compared to speed in free space. This is usually expressed as a percentage.
Voltage Drop	The amount of voltage loss from original input in a conductor of given size and length.
Voltage Rating	The highest voltage that may be continuously applied to a wire or cord in conformance with standards or specifications.
Volume Resistivity	(Specific Insulation Resistance) The electrical resistance between opposite faces of a 1-cm cube of insulating material, commonly expressed in ohm-centimeters.
Wall Thickness	A term used that expresses the thickness of a layer of applied insulation or jacket.
Wire Gauge	A system of numerical designations of wire sizes. See American Wire Gauge (AWG).
Z	Designation for impedance, expressed in ohms.

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Provide Quote on ..... **Feet/Meters** **Estimate Annual Usage** ..... **Feet/Meters**

GENERAL SPECIFICATIONS

NUMBER OF CONDUCTORS

..... or Twisted Pairs .....

CONDUCTOR MATERIAL

☐ Copper Other .....

Plating: ☐ Bare ☐ Tin ☐ Silver ☐ Nickel ☐ Other .....

AWG ..... Stranding ..... Lay of strand .....

INSULATION MATERIAL

☐ PVC ☐ Polyethylene ☐ FEP ☐ Silicone ☐ TPR ☐ PFA

☐ TEFZEL ☐ Polyurethane ☐ Other .....

O.D. ..... +/- ..... Wall ..... +/- Concentricity ..... %

SUPPLEMENTAL INSULATION

Material ..... O.D. ..... +/- ..... Wall ..... +/- Concentricity ..... %

METHOD OF CONDUCTOR IDENTITY

☐ Solid Color ☐ Stripe ☐ Other .....

OPTIONAL INTERNAL CONSTRUCTIONS

Groups: ☐ Pairs ☐ Triads ☐ Quads ☐ Other .....

Shield on Group: ☐ Aluminum Mylar **Foil:** in ☐ out ☐ .....

Drain wire: ..... AWG ..... (_/_) Plating .....

☐ Spiral ☐ Braid Shield ..... % Coverage AWG of Braid ..... Plating .....

Jacket on Group: Material ..... Wall ..... O.D. .....

CABLING OF COMPLETE CABLE

If possible, attach drawing of desired geometry.

Conductors or Twisted pairs: ..... Lay ..... ☐ Direction ☐ LH ☐ RH

☐ Optional Shields **Aluminum Mylar Foil:** ☐ in ☐ out

Drain wire: ..... AWG ..... (_/_) Plating .....

☐ Spiral ☐ Braid of: ☐ Bare ☐ Tin Plated ☐ Silver Plated ☐ Steel ☐ Other .....

☐ Semiconductive Voltage desired on shield .....

OVERALL JACKET

Material ..... Color ..... O.D. ..... Wall ..... Marking .....

VOLTAGE RATING

Volts ..... ☐ UL ☐ CSA ☐ Military

APPROVALS ..... ☐ UL ☐ CSA ☐ Military ☐ CE ☐ OTHER

SHIPPING REQUIREMENTS:

Minimum Length Requirements ..... Mults .....

NOTES: .....

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