



C102/C110 Copper Conductor Wire

Introduction

Copper is the “standard” metal used for electrical conductors. Copper has extremely high electrical conductivity, surpassed only by pure silver. It has excellent tensile, solderability, and corrosion characteristics.

C102 is an oxygen free (OF copper that has better drawing and resistance to hydrogen embrittlement than C110 (ETP). OF copper contains less dissolved oxygen than ETP, which gives OF its performance advantage. In most applications, ETP is an acceptable conductor material and is more economical than OF copper.

Both OF and ETP copper conductors are available bare, or plated with silver, nickel, or tin.

Custom constructions are available, please contact the sales department.

Fisk Alloy Wire, Inc.
P.O. Box 26
10 Thomas Road
Hawthorne, NJ 07507 U.S.A.

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Physical Properties and Specifications

PHYSICAL PROPERTIES		
PROPERTY	ENGLISH	METRIC
Tensile	32 ksi	221 MPa
Elongation	10-20%	10-20%
Electrical Conductivity	100% IACS @ 68°F	0.580 MΩ/cm @ 20°C
Electrical Resistivity	10.37 Ω-cmil/ft @ 68°F	1.724 μΩ-cm @ 20°C
Melting Point	1981°F	1083°C
Density	0.323 lbs/in ³	8.94 g/cm ³
Thermal Coefficient of Resistance	0.00218/°F	0.00393/°C

SPECIFICATIONS
ASTM B3
ASTM B8
ASTM B33
ASTM B250
ASTM B286
ASTM B298
ASTM B355
NEMA WC67

Alloy Characteristics

ALLOY NAME	TEMPER	TENSILE STRENGTH	CONDUCTIVITY	ELONGATION	FLEX LIFE	MECHANICAL PROCESSING	AVAILABLE PLATINGS	SOFTENING RESISTANCE
COPPER	Soft	32,000	100%	15%	P	E	S, N, T	-
COPPER	Hard	60,000	96%	1%	P	E	S, N, T	P
PERCON 24	Soft	60,000	90%	8%	E	E	S, N	E
C18135	Soft	60,000	90%	8%	E	E	S, N	E
PERCON 11	Hard	80,000	90%	1/5	G	VG	S, N, T	VG
PERCON 17	Soft	58,000	85%	6%	G	E	S, N	VG
PERCON 17	Hard	95,000	80%	1%	VG	E	S, N, T	G
PERCON 19	Hard	110,000	73%	1%	E	E	S, N, T	G
CALCIUM COPPER	Hard	100,000	80%	1%	VG	VG	S, N, T	G
CCS (40%)	Hard	110,000	39%	1%	E	G	S, N, T	G

E = Excellent, VG = Very Good, G = Good, P = Poor, S = Silver Plate, N = Nickel Plate, T = Tin Plate

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7-Strand Constructions

NICKEL PLATED COPPER - SOFT (50 MICRO-INCH NICKEL THICKNESS)									
AWG	CONST	DIAMETER				RESISTANCE		WEIGHT	
		inch		mm		max		max	
		min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km
22	7/30	0.0293	0.0350	0.744	0.889	15.8	51.8	2.19	3.26
24	7/32	0.0234	0.0243	0.594	0.617	25.0	82.0	1.41	2.10
26	7/34	0.0183	0.0193	0.465	0.490	40.7	133.5	0.884	1.32
28	7/36	0.0145	0.0154	0.368	0.391	65.1	213.6	0.566	0.842
30	7/38	0.0115	0.0124	0.292	0.315	105.0	344.5	0.368	0.548
32	7/40	0.00828	0.00947	0.210	0.241	204.0	669.3	0.214	0.318

SILVER PLATED COPPER - SOFT (40 MICRO-INCH SILVER THICKNESS)									
AWG	CONST	DIAMETER				RESISTANCE		WEIGHT	
		inch		mm		max		max	
		min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km
22	7/30	0.0293	0.03000	0.744	0.762	15.5	50.9	2.15	3.20
24	7/32	0.0234	0.0241	0.594	0.612	24.2	79.4	1.38	2.05
26	7/34	0.0183	0.019	0.465	0.483	39.4	129.3	0.861	1.28
28	7/36	0.0145	0.0151	0.368	0.384	63.0	206.7	0.547	0.814
30	7/38	0.0115	0.0122	0.292	0.310	99.0	324.8	0.353	0.525
32	7/40	0.00887	0.0095	0.225	0.241	168.0	551.2	0.216	0.321
34	7/42	0.0071	0.00772	0.180	0.196	262.0	859.6	0.143	0.213
36	7/44	0.00562	0.00624	0.143	0.158	420.0	1,378	0.0943	0.140
38	7/46	0.00435	0.00496	0.110	0.126	696.0	2,283	0.0594	0.088

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19-Strand Unilay Constructions

NICKEL PLATED COPPER - SOFT (50 MICRO-INCH NICKEL THICKNESS)									
AWG	CONST	DIAMETER				RESISTANCE		WEIGHT	
		inch		mm		max		max	
		min	max	min	max	Ω /mft	Ω /km	lb/mft	kg/km
18	19/30	0.0462	0.0480	1.173	1.219	5.97	19.6	5.94	8.84
20	19/32	0.0368	0.0387	0.935	0.983	9.52	31.2	3.86	5.74
22	19/34	0.0289	0.0307	0.734	0.798	15.4	50.5	2.43	3.62
24	19/36	0.0228	0.0247	0.579	0.627	24.7	81.0	1.57	2.34
26	19/38	0.0182	0.0200	0.462	0.508	40.0	131.2	1.037	1.54
28	19/40	0.0140	0.0159	0.356	0.404	67.5	221.5	0.648	0.964

SILVER PLATED COPPER - SOFT (40 MICRO-INCH NICKEL THICKNESS)									
AWG	CONST	DIAMETER				RESISTANCE		WEIGHT	
		inch		mm		max		max	
		min	max	min	max	Ω /mft	Ω /km	lb/mft	kg/km
18	19/30	0.0462	0.0480	1.173	1.196	5.97	19.0	5.94	8.53
20	19/32	0.0368	0.0387	0.935	0.958	9.52	30.2	3.86	5.49
22	19/34	0.0289	0.0307	0.734	0.757	15.4	49.2	2.43	3.45
24	19/36	0.0228	0.0247	0.579	0.605	24.7	78.4	1.57	2.17
26	19/38	0.0182	0.0200	0.462	0.485	40.0	123.7	1.037	1.41
28	19/40	0.0140	0.0159	0.356	0.378	67.5	209.0	0.648	0.860
30	19/42	0.0112	0.0121	0.284	0.307	99.0	324.8	0.381	0.567
32	19/44 ⁽¹⁾	0.0094	0.0104	0.239	0.264	154.2	505.9	0.257	0.382
(1) True Concentric									

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Single End Constructions

NICKEL PLATED COPPER - SOFT (50 INCH MICRO NICKEL THICKNESS)												
AWG	STD PLATE %	DIAMETER					RESISTANCE		WEIGHT		LENGTH	
		inch			mm		max		max		(ft/lb)	(m/kg)
		Nom	min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	Nom	Nom
30	2	0.0101	0.0099	0.0103	0.251	0.262	110.2	361.5	0.321	0.478	3,304	2,220
31	4	0.0090	0.0088	0.0092	0.224	0.234	142.5	467.5	0.256	0.381	4,171	2,803
32	4	0.0081	0.0079	0.0083	0.201	0.211	176.8	580.0	0.208	0.310	5,162	3,469
33	4	0.0071	0.0069	0.0073	0.175	0.185	231.7	760.2	0.161	0.240	6,742	4,530
34	4	0.0064	0.0062	0.0066	0.157	0.168	287.0	941.6	0.132	0.196	8,324	5,593
35	4	0.0057	0.0055	0.0059	0.140	0.150	364.7	1,197	0.105	0.156	10,534	7,078
36	4	0.0051	0.0049	0.0053	0.124	0.135	459.5	1,508	0.0850	0.126	13,214	8,879
37	7	0.0046	0.0044	0.0048	0.112	0.122	588.7	1,931	0.0697	0.1037	16,314	10,962
38	7	0.0041	0.0039	0.0043	0.099	0.109	749.3	1,458	0.0560	0.0833	20,648	13,874
39	7	0.0036	0.0034	0.0038	0.086	0.097	985.9	3,235	0.0437	0.0650	26,968	18,121
40	7	0.0032	0.0030	0.0034	0.076	0.086	1,266	4,153	0.0350	0.0521	34,377	23,100

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SILVER PLATED COPPER - SOFT (40 INCH MICRO SILVER THICKNESS)												
AWG	STD PLATE %	DIAMETER					RESISTANCE		WEIGHT		LENGTH	
		inch			mm		max		max		(ft/lb)	(m/kg)
		Nom	min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	Nom	Nom
30	2	0.0100	0.0099	0.0101	0.251	0.257	105.8	347.1	0.310	0.461	3,293	2,213
31	2.5	0.0089	0.0088	0.0090	0.224	0.229	133.9	439.3	0.246	0.366	4,155	2,792
32	2.5	0.0080	0.0079	0.0081	0.201	0.206	166.2	545.3	0.199	0.296	5,142	3,455
33	3	0.0070	0.0069	0.0071	0.175	0.180	217.8	714.6	0.153	0.228	6,711	4,509
34	3	0.0063	0.0062	0.0064	0.157	0.163	269.8	885.2	0.125	0.186	8,285	5,567
35	4	0.0056	0.0055	0.0057	0.140	0.145	342.8	1,125	0.0990	0.147	10,470	7,035
36	4	0.0050	0.0049	0.0051	0.124	0.130	431.9	1,417	0.0792	0.118	13,133	8,825
37	5	0.0045	0.0044	0.0046	0.112	0.117	535.7	1,758	0.0645	0.0960	16,189	10,878
38	5	0.0040	0.0039	0.0041	0.099	0.1040	681.9	2,237	0.0513	0.0763	20,489	13,768
39	6.1	0.0035	0.0034	0.0036	0.086	0.091	897.1	2,943	0.0396	0.0589	26,716	17,952
40	6.1	0.0031	0.0030	0.0032	0.076	0.081	1,152	3,779	0.0313	0.0466	34,055	22,883
41	8	0.0028	0.0027	0.0029	0.069	0.074	1,423	4,669	0.0258	0.0384	41,621	27,967
42	8	0.0025	0.0024	0.0026	0.061	0.066	1,801	5,909	0.0207	0.0308	52,209	35,082
43	10	0.0022	0.0021	0.0023	0.053	0.058	2,352	7,716	0.0163	0.0243	67,210	45,162
44	10	0.0020	0.0019	0.0021	0.048	0.053	2,873	9,426	0.0136	0.0202	81,324	54,646
45 ⁽¹⁾	10 ⁽²⁾	0.0018	0.00166	0.00190	0.042	0.048	3,764	12,349	0.0107	0.0159	104,688	70,345
46 ⁽¹⁾	10 ⁽²⁾	0.00157	0.00147	0.01670	0.037	0.042	4,799	15,745	0.0086	0.0128	131,560	88,402
47 ⁽¹⁾	10 ⁽²⁾	0.00140	0.00130	0.00150	0.033	0.038	6,232	20,446	0.0069	0.0103	167,052	112,251
48 ⁽¹⁾	10 ⁽²⁾	0.00124	0.00114	0.00134	0.029	0.034	7,980	26,181	0.0056	0.0083	209,913	141,052
49 ⁽¹⁾	10 ⁽²⁾	0.00111	0.00101	0.00121	0.026	0.031	10,167	33,356	0.0045	0.0067	261,961	176,025
50 ⁽¹⁾	10 ⁽²⁾	0.00099	0.00089	0.00109	0.023	0.028	13,212	43,346	0.0037	0.0055	331,993	223,084

(1) These single end sizes will be hard temper
(2) These single sizes will not have 40 micro-inches of silver

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