

Conductor Alloys



Cadmium Copper (C162)

Cadmium copper (cad copper) is one of the early high copper alloys developed for its hard drawn tensile strength. It is a binary alloy system containing approximately 1% cadmium added to pure copper.

Cad copper has good physical properties, is very economical and can be drawn to relatively fine diameters, however, it does not have the softening resistance of the more modern copper alloys when subjected to high processing or operating temperatures. Additionally, cadmium is an element of increasing environmental and worker safety concerns (see OSHA Regulation CFR 29 - 1910.1027). The European directive on Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment limits the concentration of cadmium to 100 ppm. In contrast, alloy C162 contains an average of 10,000 ppm cadmium or 100 times the allowed limit.

Cadmium copper conductors are available bare or plated with silver, nickel or tin.

	SOFT TEMPER	HARD DRAWN
Tensile	55,000 psi (379 MPa)	100,000 psi (689 MPa)
Elongation	6%	1%
Electrical Conductivity	85% IACS	80% IACS
Resistivity	12.20 Ω -cmil/ft (2.028 $\mu\Omega$ -cm)	12.96 Ω -cmil/ft (2.155 $\mu\Omega$ -cm)
Melting Point	1868°F (1030°C)	1868°F (1030°C)
Density	0.321 lb/in ³ (8.89 g/cm ³)	0.321 lb/in ³ (8.89 g/cm ³)
Thermal Coefficient of Resistance	0.00322/°C	0.00322/°C

*Reference Specs ASTM B105

Single End - Bare Cadmium Copper - Soft Temper

AWG	Diameter					Resistance max		Weight max		Break Strength min	
	nom	inch min	max	mm min	max	Ω /mft	Ω /km	lb/mft	kg/km	lb	N
30	0.0100	0.0099	0.0101	0.251	0.257	124.5	408.4	0.309	0.459	4.23	18.8
31	0.0089	0.0088	0.0090	0.224	0.229	157.6	516.9	0.245	0.365	3.35	14.9
32	0.0080	0.0079	0.0081	0.201	0.206	195.5	641.4	0.198	0.295	2.70	12.0
33	0.0071	0.0070	0.0072	0.178	0.183	249.0	816.9	0.157	0.233	2.12	9.42
34	0.0063	0.0062	0.0064	0.157	0.163	317.4	1,041	0.124	0.184	1.66	7.39
35	0.0056	0.0055	0.0057	0.140	0.145	403.3	1,323	0.0983	0.146	1.31	5.81
36	0.0050	0.0049	0.0051	0.124	0.130	508.2	1,667	0.0787	0.117	1.04	4.61
37	0.0045	0.0044	0.0046	0.112	0.117	630.2	2,068	0.0640	0.0953	0.836	3.72
38	0.0040	0.0039	0.0041	0.099	0.104	802.2	2,632	0.0509	0.0757	0.657	2.92
39	0.0035	0.0034	0.0036	0.086	0.091	1055.5	3,463	0.0392	0.0584	0.499	2.22
40	0.0031	0.0030	0.0032	0.076	0.081	1,356	4,448	0.0310	0.0461	0.389	1.73
41	0.0028	0.0027	0.0029	0.069	0.074	1,674	5,491	0.0254	0.0379	0.315	1.40
42	0.0025	0.0024	0.0026	0.061	0.066	2,118	6,950	0.0205	0.0304	0.249	1.11
43	0.0022	0.0021	0.0023	0.053	0.058	2,767	9,077	0.0160	0.0238	0.190	0.847
44	0.0020	0.0019	0.0021	0.048	0.053	3,380	11,089	0.0133	0.0199	0.156	0.694

Custom constructions are available, please contact the sales department.

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Single End - Bare Cadmium Copper - Hard Drawn

AWG	Diameter					Resistance max		Weight max		Break Strength min	
	nom	inch min	max	min	mm max	Ω /mft	Ω /km	lb/mft	kg/km	lb	N
30	0.0100	0.0099	0.0101	0.251	0.257	132.3	434.0	0.309	0.459	7.70	34.2
31	0.0089	0.0088	0.0090	0.224	0.229	167.4	549.2	0.245	0.365	6.08	27.1
32	0.0080	0.0079	0.0081	0.201	0.206	207.7	681.5	0.199	0.296	4.90	21.8
33	0.0071	0.0070	0.0072	0.178	0.183	264.6	868.0	0.157	0.233	3.85	17.1
34	0.0063	0.0062	0.0064	0.157	0.163	337.2	1,106	0.124	0.184	3.02	13.4
35	0.0056	0.0055	0.0057	0.140	0.145	428.6	1,406	0.0983	0.146	2.38	10.6
36	0.0050	0.0049	0.0051	0.124	0.130	539.9	1,771	0.0787	0.117	1.89	8.39
37	0.0045	0.0044	0.0046	0.112	0.117	669.6	2,197	0.0641	0.0953	1.52	6.76
38	0.0040	0.0039	0.0041	0.099	0.104	852.3	2,796	0.0509	0.0757	1.19	5.31
39	0.0035	0.0034	0.0036	0.086	0.091	1,121	3,679	0.0392	0.0584	0.908	4.04
40	0.0031	0.0030	0.0032	0.076	0.081	1,440	4,726	0.0310	0.0461	0.707	3.14
41	0.0028	0.0027	0.0029	0.069	0.074	1,778	5,834	0.0255	0.0379	0.573	2.55
42	0.0025	0.0024	0.0026	0.061	0.066	2,251	7,384	0.0205	0.0305	0.452	2.01
43	0.0022	0.0021	0.0023	0.053	0.058	2,940	9,644	0.0160	0.0238	0.346	1.54
44	0.0020	0.0019	0.0021	0.048	0.053	3,591	11,782	0.0133	0.0199	0.284	1.26

7-Strand Constructions - Bare Cadmium Copper - Soft Temper

AWG	Const.	Diameter				Resistance max		Weight max		Break Strength min	
		inch min	max	min	mm max	Ω /mft	Ω /km	lb/mft	kg/km	lb	N
22	7/30	0.0297	0.0303	0.754	0.770	18.1	59.4	2.21	3.28	29.6	132
24	7/32	0.0237	0.0243	0.602	0.617	28.2	92.5	1.41	2.10	18.9	83.9
26	7/34	0.0186	0.0192	0.472	0.488	45.8	150.3	0.882	1.31	11.6	51.7
28	7/36	0.0147	0.0153	0.373	0.389	73.4	240.8	0.560	0.834	7.26	32.3
30	7/38	0.0117	0.0123	0.297	0.312	115.4	378.6	0.361	0.537	4.60	20.5
32	7/40	0.0090	0.0096	0.229	0.244	195.7	642.1	0.221	0.328	2.72	12.1
34	7/42	0.0072	0.0078	0.183	0.198	305.8	1,003	0.146	0.217	1.74	7.75
36	7/44	0.0057	0.0063	0.145	0.160	486.1	1,595	0.0947	0.141	1.09	4.86

7-Strand Constructions - Bare Cadmium Copper - Hard Drawn

AWG	Const.	Diameter				Resistance max		Weight max		Break Strength min	
		inch min	max	min	mm max	Ω /mft	Ω /km	lb/mft	kg/km	lb	N
22	7/30	0.0297	0.0303	0.754	0.770	19.2	62.9	2.21	3.28	53.9	240
24	7/32	0.0237	0.0243	0.602	0.617	30.0	98.3	1.41	2.10	34.3	153
26	7/34	0.0186	0.0192	0.472	0.488	48.7	159.7	0.882	1.31	21.1	94.0
28	7/36	0.0147	0.0153	0.373	0.389	77.9	255.7	0.560	0.834	13.2	58.7
30	7/38	0.0117	0.0123	0.297	0.312	122.6	402.2	0.361	0.537	8.36	37.2
32	7/40	0.0090	0.0096	0.229	0.244	207.9	682.1	0.221	0.328	4.95	22.0
34	7/42	0.0072	0.0078	0.183	0.198	324.9	1,066	0.146	0.217	3.17	14.1
36	7/44	0.0057	0.0063	0.145	0.160	516.5	1,695	0.0947	0.141	1.98	8.83

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19-Strand Unilay Constructions - Bare Cadmium Copper - Soft Temper

AWG	Const.	Diameter				Resistance		Weight		Break Strength	
		inch		mm		max		max		min	
		min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
18	19/30	0.0466	0.0476	1.184	1.209	6.84	22.4	5.81	8.64	80.4	358
20	19/32	0.0372	0.0382	0.945	0.970	10.7	35.1	3.73	5.56	51.2	228
22	19/34	0.0292	0.0302	0.742	0.767	17.5	57.4	2.34	3.49	31.5	140
24	19/36	0.0231	0.0240	0.587	0.610	27.9	91.5	1.48	2.20	19.7	87.7
26	19/38	0.0184	0.0193	0.467	0.490	44.1	144.7	0.957	1.42	12.5	55.5
28	19/40	0.0141	0.0151	0.358	0.384	74.5	244.4	0.583	0.867	7.39	32.9
30	19/42	0.0113	0.0123	0.287	0.312	115.9	380.2	0.383	0.570	4.73	21.0
32	19/44*	0.0095	0.0105	0.241	0.267	181.4	595.3	0.258	0.384	2.96	13.2

*True concentric

19-Strand Unilay Constructions - Bare Cadmium Copper - Hard Drawn

AWG	Const.	Diameter				Resistance		Weight		Break Strength	
		inch		mm		max		max		min	
		min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
18	19/30	0.0466	0.0476	1.184	1.209	7.27	23.9	5.81	8.64	146	651
20	19/32	0.0372	0.0382	0.945	0.970	11.4	37.5	3.73	5.56	93.1	414
22	19/34	0.0292	0.0302	0.742	0.767	18.6	61.1	2.34	3.49	57.4	255
24	19/36	0.0231	0.0240	0.587	0.610	29.6	97.2	1.48	2.20	35.8	159
26	19/38	0.0184	0.0193	0.467	0.490	46.9	153.7	0.957	1.42	22.7	101.0
28	19/40	0.0141	0.0151	0.358	0.384	79.1	259.6	0.583	0.867	13.4	59.7
30	19/42	0.0113	0.0123	0.287	0.312	123.1	403.9	0.383	0.570	8.60	38.2
32	19/44*	0.0095	0.0105	0.241	0.267	191.8	629.4	0.258	0.384	5.39	24.0

*True concentric

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