

Copperweld pioneered the science of bimetals in 1915 with the invention of the original copper-clad steel (CCS) wire, our trademarked Copperweld®. By metallurgically bonding high-strength steel to conductive, corrosion-resistant copper in a patented continuous solid-cladding process, we have created an extraordinary conductor that provides value and benefits that neither metal can provide alone.

Because the bulk of the current travels along the wire's skin, the copper cladding represents only 3% of the overall wire diameter, yet provides a conductivity of 21% IACS. The steel used at the core of the wire can be of whatever grade is best suited to our clients' particular applications.

Copperweld® offers numerous value advantages. Steel's low price compared to copper represents upfront cost savings, but high tensile strength also means longer spans with less breakage, so installation is more efficient. Continuous copper cladding without chips or breaks means no chance of oxidation, so our value holds longer over time.

NOTE: Properties noted in these data sheets are typical values for standard applications. If your application requires performance values beyond those noted, please contact Copperweld's Engineering Support Center at engineering@copperweld.com or **+1.931.433.7177**. Material selection, varying composition and processing conditions all provide flexibility in how Copperweld can deliver exactly the product you need. Bimetallic conductors from Copperweld offer many distinct advantages, and our engineering team works in concert with our clients to determine the proper components for the stringent requirements of their products.

PHYSICAL AND ELECTRICAL PROPERTIES OF COPPERWELD® CCS WIRE
21% CONDUCTIVITY ANNEALED
(METRIC UNITS)

AWG	DIAMETER		CROSS SECTIONAL AREA (mm ²)	WEIGHT		NOMINAL COPPER THICKNESS (mm)	NOMINAL DC RESISTANCE (Ω/km)	MIN BREAKING LOADS (kgf)	AWG
	Inch	mm		kg/km	lbs/km			LOW CARBON (LC)	
0	0.3249	8.25	53.49	427.2	941.7	0.2476	1.535	-	0
1	0.2893	7.35	42.41	338.7	746.7	0.2204	1.936	-	1
2	0.2576	6.54	33.62	268.5	592.0	0.1963	2.442	1147	2
3	0.2294	5.83	26.67	212.9	469.5	0.1748	3.079	909	3
4	0.2043	5.19	21.15	168.9	372.4	0.1557	3.882	721	4
5	0.1819	4.62	16.77	133.9	295.2	0.1386	4.897	572	5
6	0.1620	4.11	13.30	106.2	234.1	0.1234	6.174	454	6
7	0.1443	3.67	10.55	84.26	185.8	0.1100	7.781	360	7
8	0.1285	3.26	8.367	66.82	147.3	0.0979	9.812	285	8
9	0.1144	2.91	6.631	52.96	116.8	0.0872	12.38	226	9
10	0.1019	2.59	5.261	42.02	92.63	0.0776	15.60	179	10
11	0.0907	2.30	4.168	33.29	73.39	0.0691	19.70	144	11
12	0.0808	2.05	3.308	26.42	58.24	0.0616	24.82	114	12
13	0.0720	1.83	2.627	20.98	46.25	0.0549	31.26	91	13
14	0.0641	1.63	2.082	16.63	36.66	0.0488	39.43	72	14
15	0.0571	1.45	1.652	13.19	29.09	0.0435	49.70	57	15
16	0.0508	1.29	1.308	10.44	23.02	0.0387	62.79	45	16
17	0.0453	1.15	1.040	8.304	18.31	0.0345	78.96	36	17
18	0.0403	1.02	0.823	6.572	14.49	0.0307	99.76	28	18
19	0.0359	0.91	0.653	5.215	11.50	0.0274	125.7	23	19
20	0.0320	0.81	0.519	4.144	9.135	0.0244	158.2	18	20
21	0.0285	0.72	0.412	3.287	7.246	0.0217	199.5	14	21
22	0.0253	0.64	0.324	2.590	5.710	0.0193	253.1	11	22
23	0.0226	0.57	0.259	2.067	4.557	0.0172	317.2	9	23
24	0.0201	0.51	0.205	1.635	3.605	0.0153	401.0	7.1	24
25	0.0179	0.45	0.162	1.297	2.858	0.0136	505.7	5.6	25
26	0.0159	0.40	0.129	1.028	2.267	0.0121	637.6	4.4	26
27	0.0142	0.36	0.102	0.815	1.798	0.0108	804.0	3.5	27

SPECIFICATIONS:

ASTM B-869 Copper-Clad Steel Electrical Conductor for Cable TV Drop Wire

ASTM B-910 Annealed Copper-Clad Steel Wire

PHYSICAL AND ELECTRICAL PROPERTIES OF COPPERWELD® CCS WIRE

21% CONDUCTIVITY HARD DRAWN
(METRIC UNITS)

AWG	DIAMETER		CROSS SECTIONAL AREA (mm ²)	WEIGHT		NOMINAL COPPER THICKNESS (mm)	NOMINAL DC RESISTANCE (Ω/km)	MIN BREAKING LOADS (kgf)		AWG
	Inch	mm		kg/km	lbs/km			LOW CARBON (LC)	EXTRA HIGH STRENGTH (EHS)	
0	0.3249	8.25	53.49	427.2	941.7	0.24757	1.535	2737	5290	0
1	0.2893	7.35	42.41	338.7	746.7	0.22045	1.936	2401	4339	1
2	0.2576	6.54	33.62	268.5	592.0	0.19629	2.442	2064	3624	2
3	0.2294	5.83	26.67	212.9	469.5	0.17480	3.079	1728	3038	3
4	0.2043	5.19	21.15	168.9	372.4	0.15568	3.882	1428	2496	4
5	0.1819	4.62	16.77	133.9	295.2	0.13861	4.897	1189	2064	5
6	0.1620	4.11	13.30	106.2	234.1	0.12344	6.174	980	1696	6
7	0.1443	3.67	10.55	84.26	185.8	0.10996	7.781	806	1425	7
8	0.1285	3.26	8.367	66.82	147.3	0.09792	9.812	656	1173	8
9	0.1144	2.91	6.631	52.96	116.8	0.08717	12.38	543	973	9
10	0.1019	2.59	5.261	42.02	92.63	0.07765	15.60	456	818	10
11	0.0907	2.30	4.168	33.29	73.39	0.06911	19.70	375	684	11
12	0.0808	2.05	3.308	26.42	58.24	0.06157	24.82	262	393	12
13	0.0720	1.83	2.627	20.98	46.25	0.05486	31.26	216	325	13
14	0.0641	1.63	2.082	16.63	36.66	0.04884	39.43	181	268	14
15	0.0571	1.45	1.652	13.19	29.09	0.04351	49.70	139	223	15
16	0.0508	1.29	1.308	10.44	23.02	0.03871	62.79	114	185	16
17	0.0453	1.15	1.040	8.304	18.31	0.03452	78.96	93	153	17
18	0.0403	1.02	0.823	6.572	14.49	0.03071	99.76	78	127	18
19	0.0359	0.91	0.653	5.215	11.50	0.02736	125.7	59	107	19
20	0.0320	0.81	0.519	4.144	9.135	0.02438	158.2	49	80	20
21	0.0285	0.72	0.412	3.287	7.246	0.02172	199.5	39	68	21
22	0.0253	0.64	0.324	2.590	5.710	0.01928	253.1	31	58	22
23	0.0226	0.57	0.259	2.067	4.557	0.01722	317.2	24	46	23
24	0.0201	0.51	0.205	1.635	3.605	0.01532	401.0	20	38	24
25	0.0179	0.45	0.162	1.297	2.858	0.01364	505.7			25
26	0.0159	0.40	0.129	1.028	2.267	0.01215	637.6			26
27	0.0142	0.36	0.102	0.815	1.798	0.01082	804.0			27
28	0.0126	0.32	0.081	0.647	1.426	0.00963	1014			28
29	0.0113	0.29	0.064	0.513	1.131	0.00858	1278			29
30	0.0100	0.25	0.051	0.407	0.897	0.00764	1612			30
31	0.0089	0.23	0.040	0.323	0.711	0.00680	2033			31
32	0.0080	0.20	0.032	0.256	0.564	0.00606	2564			32
33	0.0071	0.18	0.025	0.203	0.447	0.00539	3232			33
34	0.0063	0.16	0.020	0.161	0.355	0.00480	4076			34
35	0.0056	0.14	0.016	0.128	0.281	0.00428	5139			35
36	0.0050	0.13	0.013	0.101	0.223	0.00381	6481			36
37	0.0045	0.11	0.010	0.080	0.177	0.00339	8171			37
38	0.0040	0.10	0.008	0.064	0.140	0.00302	10306			38
39	0.0035	0.09	0.006	0.050	0.111	0.00269	12995			39

For information and technical specifications on fine wire gauges, please contact your Copperweld representative, or our Engineering Support Center.

SPECIFICATIONS:

ASTM B-869 Copper-Clad Steel Electrical Conductor for Cable TV Drop Wire

ASTM B-910 Annealed Copper-Clad Steel Wire

PHYSICAL AND ELECTRICAL PROPERTIES OF COPPERWELD® CCS WIRE

21% CONDUCTIVITY HARD DRAWN
(US/IMPERIAL UNITS)

AWG	DIAMETER (in)	CROSS SECTIONAL AREA		WEIGHT (lbs/kft)	NOMINAL COPPER THICKNESS (in)	NOMINAL DC RESISTANCE (Ω/kft)	MIN BREAKING LOADS (lbf)		AWG
		in ²	cmil				LOW CARBON (LC)	EXTRA HIGH STRENGTH (EHS)	
0	0.3249	0.082907	105,560	287.02	0.00975	0.468	6033	11664	0
1	0.2893	0.065733	83,694	227.57	0.00868	0.590	5293	9566	1
2	0.2576	0.052117	66,358	180.43	0.00773	0.744	4551	7989	2
3	0.2294	0.041331	52,624	143.09	0.00688	0.939	3810	6697	3
4	0.2043	0.032781	41,738	113.49	0.00613	1.183	3149	5502	4
5	0.1819	0.025987	33,088	89.97	0.00546	1.493	2622	4551	5
6	0.1620	0.020612	26,244	71.36	0.00486	1.882	2160	3740	6
7	0.1443	0.016354	20,822	56.62	0.00433	2.372	1777	3142	7
8	0.1285	0.012969	16,512	44.90	0.00386	2.991	1447	2586	8
9	0.1144	0.010279	13,087	35.59	0.00343	3.774	1197	2144	9
10	0.1019	0.008155	10,384	28.23	0.00306	4.757	1005	1804	10
11	0.0907	0.006461	8,226	22.37	0.00272	6.004	826	1508	11
12	0.0808	0.005128	6,529	17.75	0.00242	7.565	578	867	12
13	0.0720	0.004072	5,184	14.10	0.00216	9.527	475	717	13
14	0.0641	0.003227	4,109	11.17	0.00192	12.02	400	590	14
15	0.0571	0.002561	3,260	8.87	0.00171	15.15	307	493	15
16	0.0508	0.002027	2,581	7.02	0.00152	19.14	251	408	16
17	0.0453	0.001612	2,052	5.58	0.00136	24.07	206	337	17
18	0.0403	0.001276	1,624	4.42	0.00121	30.41	171	280	18
19	0.0359	0.001012	1,289	3.50	0.00108	38.32	129	236	19
20	0.0320	0.000804	1,024	2.78	0.00096	48.23	108	177	20
21	0.0286	0.000644	820	2.23	0.00086	60.20	86	150	21
22	0.0253	0.000505	642	1.75	0.00076	76.88	68	127	22
23	0.0226	0.000400	509	1.39	0.00068	96.94	54	101	23
24	0.0201	0.000317	404	1.10	0.00060	122.2	45	84	24
25	0.0179	0.000252	320	0.87	0.00054	154.1			25
26	0.0159	0.000200	254	0.69	0.00048	194.4			26
27	0.0142	0.000158	202	0.55	0.00043	245.1			27
28	0.0126	0.000126	160	0.43	0.00038	309.1			28
29	0.0113	0.000100	127	0.34	0.00034	389.7			29
30	0.0100	0.000079	101	0.27	0.00030	491.4			30
31	0.0089	0.000063	80	0.22	0.00027	619.6			31
32	0.0080	0.000050	63	0.17	0.00024	781.5			32
33	0.0071	0.000039	50	0.14	0.00021	985.3			33
34	0.0063	0.000031	40	0.11	0.00019	1,242			34
35	0.0056	0.000025	32	0.09	0.00017	1,567			35
36	0.0050	0.000020	25	0.07	0.00015	1,976			36
37	0.0045	0.000016	20	0.05	0.00013	2,491			37
38	0.0040	0.000012	16	0.04	0.00012	3,142			38
39	0.0035	0.000010	12	0.03	0.00011	3,961			39

For information and technical specifications on fine wire gauges, please contact your Copperweld representative, or our Engineering Support Center.

COPPERWELD® COPPER-CLAD STEEL 21% IACS (US/IMPERIAL)



COPPERWELD

AWG	DIAMETER in	CROSS SECTIONAL AREA		WEIGHT (lbs/kft)	NOMINAL COPPER THICKNESS (in)	NOMINAL DC RESISTANCE (Ω/kft)	MIN BREAKING LOADS (lbf)	AWG
		in ²	cmil				LOW CARBON (LC)	
0	0.3249	0.08291	105560	287.02	0.00975	0.468	-	0
1	0.2893	0.06573	83694	227.57	0.00868	0.590	-	1
2	0.2576	0.05212	66358	180.43	0.00773	0.744	2528	2
3	0.2294	0.04133	52624	143.09	0.00688	0.939	2005	3
4	0.2043	0.03278	41738	113.49	0.00613	1.183	1590	4
5	0.1819	0.02599	33088	89.97	0.00546	1.493	1261	5
6	0.1620	0.02061	26244	71.36	0.00486	1.882	1000	6
7	0.1443	0.01635	20822	56.62	0.00433	2.372	793	7
8	0.1285	0.01297	16512	44.90	0.00386	2.991	629	8
9	0.1144	0.01028	13087	35.59	0.00343	3.774	499	9
10	0.1019	0.00816	10384	28.23	0.00306	4.757	396	10
11	0.0907	0.00646	8226	22.37	0.00272	6.004	317	11
12	0.0808	0.00513	6529	17.75	0.00242	7.565	251	12
13	0.0720	0.00407	5184	14.10	0.00216	9.527	200	13
14	0.0641	0.00323	4109	11.17	0.00192	12.02	158	14
15	0.0571	0.00256	3260	8.87	0.00171	15.15	125	15
16	0.0508	0.00203	2581	7.02	0.00152	19.14	99	16
17	0.0453	0.00161	2052	5.58	0.00136	24.07	79	17
18	0.0403	0.00128	1624	4.42	0.00121	30.41	63	18
19	0.0359	0.00101	1289	3.50	0.00108	38.32	50	19
20	0.0320	0.00080	1024	2.78	0.00096	48.23	39	20
21	0.0286	0.00064	820	2.23	0.00086	60.20	32	21
22	0.0253	0.00050	642	1.75	0.00076	76.88	25	22
23	0.0226	0.00040	509	1.39	0.00068	96.94	20	23
24	0.0201	0.00032	404	1.10	0.00060	122.2	16	24
25	0.0179	0.00025	320	0.87	0.00054	154.1	12	25
26	0.0159	0.00020	254	0.69	0.00048	194.4	10	26
27	0.0142	0.00016	202	0.55	0.00043	245.1	8	27

COPPERWELD® COPPER-CLAD STEEL 21% IACS (US/IMPERIAL)



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