

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 7% of the overall wire diameter, yet provides a conductivity of 30% 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
30% CONDUCTIVITY ANNEALED
(METRIC UNITS)

AWG	DIAMETER		CROSS SECTIONAL AREA (mm²)	WEIGHT		NOMINAL COPPER THICKNESS (mm)	NOMINAL DC RESISTANCE (Ω/km)	MIN BREAKING LOADS (kgf)		AWG
	Inch	mm		kg/km	lbs/km			LOW CARBON (LC)	HIGH STRENGTH (HS)	
0	0.3249	8.25	53.488	435.9	960.9	0.5777	1.074	-	-	0
1	0.2893	7.35	42.409	345.6	761.9	0.5144	1.355	-	-	1
2	0.2576	6.54	33.624	274.0	604.1	0.4580	1.709	1032	1147	2
3	0.2294	5.83	26.665	217.3	479.1	0.4079	2.155	819	909	3
4	0.2043	5.19	21.149	172.3	380.0	0.3632	2.717	649	721	4
5	0.1819	4.62	16.766	136.6	301.2	0.3234	3.428	515	572	5
6	0.1620	4.11	13.298	108.4	238.9	0.2880	4.322	408	454	6
7	0.1443	3.67	10.551	85.98	189.6	0.2566	5.447	324	360	7
8	0.1285	3.26	8.367	68.18	150.3	0.2285	6.869	257	285	8
9	0.1144	2.91	6.631	54.04	119.1	0.2034	8.666	204	226	9
10	0.1019	2.59	5.261	42.88	94.52	0.1812	10.92	162	179	10
11	0.0907	2.30	4.168	33.97	74.89	0.1613	13.79	129	144	11
12	0.0808	2.05	3.308	26.96	59.43	0.1437	17.37	103	114	12
13	0.0720	1.83	2.627	21.41	47.19	0.1280	21.88	81	91	13
14	0.0641	1.63	2.082	16.97	37.40	0.1140	27.60	65	72	14
15	0.0571	1.45	1.652	13.46	29.68	0.1015	34.79	51	57	15
16	0.0508	1.29	1.308	10.66	23.49	0.0903	43.95	41	45	16
17	0.0453	1.15	1.040	8.473	18.68	0.0805	55.27	32	36	17
18	0.0403	1.02	0.823	6.706	14.78	0.0717	69.84	26	28	18
19	0.0359	0.91	0.653	5.322	11.73	0.0638	88.00	20	23	19
20	0.0320	0.81	0.519	4.228	9.322	0.0569	110.8	16	18	20
21	0.0285	0.72	0.412	3.354	7.394	0.0507	139.6	13	16	21
22	0.0253	0.64	0.324	2.643	5.827	0.0450	177.2	10	12	22
23	0.0226	0.57	0.259	2.109	4.650	0.0402	222.1	8	10	23
24	0.0201	0.51	0.205	1.668	3.678	0.0357	280.7	6	8	24
25	0.0179	0.45	0.162	1.323	2.917	0.0318	354.0	5	6	25
26	0.0159	0.40	0.129	1.049	2.313	0.0283	446.3	4	5	26
27	0.0142	0.36	0.102	0.832	1.835	0.0252	562.8	3	4	27

SPECIFICATIONS:

- ASTM B-227** Hard-Drawn Copper-Clad Steel Wire
- ASTM B-452** Copper-Clad Steel Wire for Electronic Application
- ASTM B-910** Annealed Copper-Clad Steel Wire
- BS 4087** Copper-Clad Steel Wire

PHYSICAL AND ELECTRICAL PROPERTIES OF COPPERWELD® CCS WIRE

30% 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)	HIGH STRENGTH (HS)	EXTRA HIGH STRENGTH (EHS)	
0	0.3249	8.25	53.488	435.9	960.9	0.5777	1.074	2335	3174	4561	0
1	0.2893	7.35	42.409	345.6	761.9	0.5144	1.355	2083	2835	4021	1
2	0.2576	6.54	33.624	274.0	604.1	0.4580	1.709	1766	2408	3326	2
3	0.2294	5.83	26.665	217.3	479.1	0.4079	2.155	1492	2001	2747	3
4	0.2043	5.19	21.149	172.3	380.0	0.3632	2.717	1212	1731	2056	4
5	0.1819	4.62	16.766	136.6	301.2	0.3234	3.428	1006	1430	1721	5
6	0.1620	4.11	13.298	108.4	238.9	0.2880	4.322	835	1179	1429	6
7	0.1443	3.67	10.551	85.98	189.6	0.2566	5.447	698	972	1180	7
8	0.1285	3.26	8.367	68.18	150.3	0.2285	6.869	571	799	970	8
9	0.1144	2.91	6.631	54.04	119.1	0.2034	8.666	466	656	788	9
10	0.1019	2.59	5.261	42.88	94.52	0.1812	10.92	384	542	642	10
11	0.0907	2.30	4.168	33.97	74.89	0.1613	13.79	312	442	514	11
12	0.0808	2.05	3.308	26.96	59.43	0.1437	17.37	256	274	408	12
13	0.0720	1.83	2.627	21.41	47.19	0.1280	21.88	185	230	324	13
14	0.0641	1.63	2.082	16.97	37.40	0.1140	27.60	142	182	257	14
15	0.0571	1.45	1.652	13.46	29.68	0.1015	34.79	116	145	204	15
16	0.0508	1.29	1.308	10.66	23.49	0.0903	43.95	95	114	161	16
17	0.0453	1.15	1.040	8.473	18.68	0.0805	55.27	78	91	128	17
18	0.0403	1.02	0.823	6.706	14.78	0.0717	69.84	64	74	102	18
19	0.0359	0.91	0.653	5.322	11.73	0.0638	88.00	49	59	81	19
20	0.0320	0.81	0.519	4.228	9.322	0.0569	110.8	40	48	64	20
21	0.0285	0.72	0.412	3.354	7.394	0.0507	139.6	32	36	70	21
22	0.0253	0.64	0.324	2.643	5.827	0.0450	177.2	25	28	55	22
23	0.0226	0.57	0.259	2.109	4.650	0.0402	222.1	21	23	45	23
24	0.0201	0.51	0.205	1.668	3.678	0.0357	280.7	17	18	36	24
25	0.0179	0.45	0.162	1.323	2.917	0.0318	354.0				25
26	0.0159	0.40	0.129	1.049	2.313	0.0283	446.3				26
27	0.0142	0.36	0.102	0.832	1.835	0.0252	562.8				27
28	0.0126	0.32	0.081	0.660	1.455	0.0225	709.8				28
29	0.0113	0.29	0.064	0.523	1.154	0.0200	894.9				29
30	0.0100	0.25	0.051	0.415	0.915	0.0178	1129				30
31	0.0089	0.23	0.040	0.329	0.726	0.0159	1423				31
32	0.0080	0.20	0.032	0.261	0.575	0.0141	1795				32
33	0.0071	0.18	0.025	0.207	0.456	0.0126	2263				33
34	0.0063	0.16	0.020	0.164	0.362	0.0112	2853				34
35	0.0056	0.14	0.016	0.130	0.287	0.0100	3597				35
36	0.0050	0.13	0.013	0.103	0.228	0.0089	4537				36
37	0.0045	0.11	0.010	0.082	0.181	0.0079	5720				37
38	0.0040	0.10	0.008	0.065	0.143	0.0070	7214				38
39	0.0035	0.09	0.006	0.051	0.113	0.0063	9097				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

30% 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)	HIGH STRENGTH (HS)	EXTRA HIGH STRENGTH (EHS)	
0	0.3249	0.082907	105560	292.9	0.02274	0.327	5148	6998	10055	0
1	0.2893	0.065733	83694	232.2	0.02025	0.413	4592	6250	8865	1
2	0.2576	0.052117	66358	184.1	0.01803	0.521	3894	5309	7332	2
3	0.2294	0.041331	52624	146.0	0.01606	0.657	3288	4411	6055	3
4	0.2043	0.032781	41738	115.8	0.01430	0.828	2672	3817	4532	4
5	0.1819	0.025987	33088	91.81	0.01273	1.045	2219	3152	3795	5
6	0.1620	0.020612	26244	72.82	0.01134	1.317	1840	2600	3150	6
7	0.1443	0.016354	20822	57.78	0.01010	1.660	1539	2142	2602	7
8	0.1285	0.012969	16512	45.82	0.00900	2.094	1258	1762	2139	8
9	0.1144	0.010279	13087	36.31	0.00801	2.641	1027	1446	1736	9
10	0.1019	0.008155	10384	28.81	0.00713	3.329	847	1195	1416	10
11	0.0907	0.006461	8226	22.83	0.00635	4.202	687	975	1134	11
12	0.0808	0.005128	6529	18.11	0.00566	5.295	564	603	900	12
13	0.0720	0.004072	5184	14.38	0.00504	6.669	407	507	714	13
14	0.0641	0.003227	4109	11.40	0.00449	8.414	312	402	566	14
15	0.0571	0.002561	3260	9.047	0.00400	10.60	256	319	449	15
16	0.0508	0.002027	2581	7.160	0.00356	13.40	210	252	356	16
17	0.0453	0.001612	2052	5.694	0.00317	16.85	171	201	283	17
18	0.0403	0.001276	1624	4.506	0.00282	21.29	140	163	224	18
19	0.0359	0.001012	1289	3.576	0.00251	26.82	108	129	178	19
20	0.0320	0.000804	1024	2.841	0.00224	33.76	88	106	141	20
21	0.0285	0.000638	812	2.254	0.00200	42.56	70	79	154	21
22	0.0253	0.000503	640	1.776	0.00177	54.01	55	63	121	22
23	0.0226	0.000401	511	1.417	0.00158	67.68	47	50	99	23
24	0.0201	0.000317	404	1.121	0.00141	85.56	37	40	79	24
25	0.0179	0.000252	320	0.889	0.00125	107.9				25
26	0.0159	0.000200	254	0.705	0.00112	136.0				26
27	0.0142	0.000158	202	0.559	0.00099	171.5				27
28	0.0126	0.000126	160	0.443	0.00088	216.3				28
29	0.0113	0.000100	127	0.352	0.00079	272.8				29
30	0.0100	0.000079	101	0.279	0.00070	344.0				30
31	0.0089	0.000063	80	0.221	0.00062	433.7				31
32	0.0080	0.000050	63	0.175	0.00056	547.0				32
33	0.0071	0.000039	50	0.139	0.00050	689.7				33
34	0.0063	0.000031	40	0.110	0.00044	869.6				34
35	0.0056	0.000025	32	0.087	0.00039	1096				35
36	0.0050	0.000020	25	0.069	0.00035	1383				36
37	0.0045	0.000016	20	0.055	0.00031	1743				37
38	0.0040	0.000012	16	0.044	0.00028	2199				38
39	0.0035	0.000010	12	0.035	0.00025	2773				39

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



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)	HIGH STRENGTH (HS)	
0	0.3249	0.082907	105560	292.9	0.02274	0.327	-	-	0
1	0.2893	0.065733	83694	232.2	0.02025	0.413	-	-	1
2	0.2576	0.052117	66358	184.1	0.01803	0.521	2275	2528	2
3	0.2294	0.041331	52624	146.0	0.01606	0.657	1805	2005	3
4	0.2043	0.032781	41738	115.8	0.01430	0.828	1431	1590	4
5	0.1819	0.025987	33088	91.81	0.01273	1.045	1135	1261	5
6	0.1620	0.020612	26244	72.82	0.01134	1.317	900	1000	6
7	0.1443	0.016354	20822	57.78	0.01010	1.660	714	793	7
8	0.1285	0.012969	16512	45.82	0.00900	2.094	566	629	8
9	0.1144	0.010279	13087	36.31	0.00801	2.641	449	499	9
10	0.1019	0.008155	10384	28.81	0.00713	3.329	356	396	10
11	0.0907	0.006461	8226	22.83	0.00635	4.202	285	317	11
12	0.0808	0.005128	6529	18.11	0.00566	5.295	226	251	12
13	0.0720	0.004072	5184	14.38	0.00504	6.669	180	200	13
14	0.0641	0.003227	4109	11.40	0.00449	8.414	142	158	14
15	0.0571	0.002561	3260	9.047	0.00400	10.60	113	125	15
16	0.0508	0.002027	2581	7.160	0.00356	13.40	89	99	16
17	0.0453	0.001612	2052	5.694	0.00317	16.85	71	79	17
18	0.0403	0.001276	1624	4.506	0.00282	21.29	56	63	18
19	0.0359	0.001012	1289	3.576	0.00251	26.82	45	50	19
20	0.0320	0.000804	1024	2.841	0.00224	33.76	35	39	20
21	0.0285	0.000638	812	2.254	0.00200	42.56	28	34	21
22	0.0253	0.000503	640	1.776	0.00177	54.01	22	27	22
23	0.0226	0.000401	511	1.417	0.00158	67.68	18	22	23
24	0.0201	0.000317	404	1.121	0.00141	85.56	14	17	24
25	0.0179	0.000252	320	0.889	0.00125	107.9	11	14	25
26	0.0159	0.000200	254	0.705	0.00112	136.0	9	11	26
27	0.0142	0.000158	202	0.559	0.00099	171.5	7	9	27

30% IACS (US/IMPERIAL)

COPPERWELD® COPPER-CLAD STEEL



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