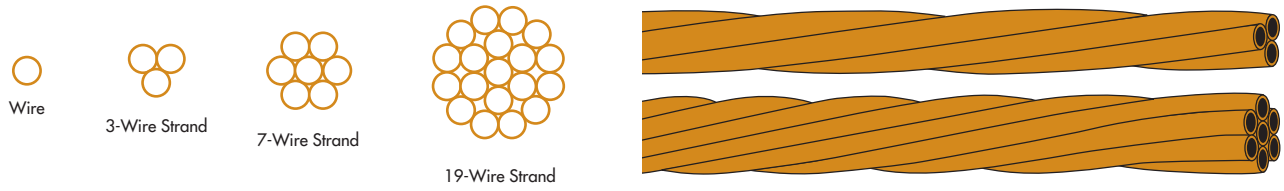
COPPERWELD®
WIRE AND STRAND ANNEALED



Consisting of a copper cladding metallurgically bonded to a steel core, Copperweld® CCS wire effectively combines the strength of steel with the conductivity and corrosion resistance of copper. Standard copper cladding thicknesses result in a composite conductivity of 30% or 40% IACS. Copperweld wire is available with two types of steel: a strong, high carbon, heat treated steel for the high- strength (HS) and extra-high-strength (EHS) grades and a low carbon (LC) steel for special applications.

Copperweld strand is concentrically stranded cable of one or more layers with left-hand lay in the outer layer unless otherwise specified. In any strand, the individual wires are of the same size.

Copperweld annealed wire and strand offers tensile strengths from 40000 – 100000 psi [2812 - 7031 kgf/cm^2]. For applications requiring greater tensile strength, Copperweld wire and strand are also available in a hard-drawn state.

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 **+1.615.377.4200**. 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.

Specifications:

ASTM B-910 Annealed Copper-Clad steel wire

BARE SOLID COPPERWELD® WIRES, LOW CARBON AND HIGH STRENGTH PHYSICAL AND ELECTRICAL CHARACTERISTICS

(METRIC UNITS)

CONDUCTOR SIZE AWG	DIAMETER		MIN BREAKING LOADS (kgf)				WEIGHT (kg/km)		NOMINAL DC RESISTANCE at 20°C (Ω/km)		CROSS SECTION AREA	
			LOW CARBON		HIGH STRENGTH							
	(inch)	(mm)	40% COND	30% COND	40% COND	30% COND	40% COND	30% COND	40% COND	30% COND	(cmil)	(mm^2)
2	0.2576	6.54	917	1032	1032	1147	276.9	274.0	1.2819	1.7092	66358	33.62
3	0.2294	5.83	728	819	819	909	219.6	217.3	1.6164	2.1552	52624	26.67
4	0.2043	5.19	577	649	649	721	174.2	172.3	2.0380	2.7174	41738	21.15
5	0.1819	4.62	457	515	515	572	138.1	136.6	2.5709	3.4278	33088	16.77
6	0.1620	4.11	363	408	408	454	109.5	108.4	3.2413	4.3217	26244	13.30
7	0.1443	3.67	288	324	324	360	86.89	85.98	4.0852	5.4469	20822	10.55
8	0.1285	3.26	228	257	257	285	68.90	68.18	5.1516	6.8687	16512	8.37
9	0.1144	2.91	181	204	204	226	54.61	54.04	6.4997	8.6663	13087	6.63
10	0.1019	2.59	144	162	162	179	43.33	42.88	8.1921	10.923	10384	5.26
12	0.0808	2.05	91	103	103	114	27.24	26.96	13.029	17.373	6529	3.31

BARE SOLID COPPERWELD® WIRES, LOW CARBON AND HIGH STRENGTH PHYSICAL AND ELECTRICAL CHARACTERISTICS

(METRIC UNITS)

CONDUCTOR SIZE AWG	DIAMETER		MIN BREAKING LOADS (kgf)				WEIGHT (kg/km)		NOMINAL DC RESISTANCE at 20°C (Ω/km)		CROSS SECTION AREA	
			LOW CARBON		HIGH STRENGTH		40% COND	30% COND				
	(inch)	(mm)	40% COND	30% COND	40% COND	30% COND			40% COND	30% COND	(cmil)	(mm²)
13	0.0720	1.83	72.40	81.45	81.45	90.50	21.63	21.41	16	22	5184	2.63
14	0.0641	1.63	57.39	64.56	64.56	71.73	17.15	16.97	21	28	4109	2.08
15	0.0571	1.45	45.54	51.23	51.23	56.92	13.60	13.46	26	35	3260	1.65
16	0.0508	1.29	36.04	40.55	40.55	45.05	10.77	10.66	33	44	2581	1.31
17	0.0453	1.15	28.66	32.24	32.24	35.83	8.563	8.473	42	55	2052	1.04
18	0.0403	1.02	22.68	25.52	25.52	28.35	6.777	6.706	52	70	1624	0.82
19	0.0359	0.91	18.00	20.25	20.25	22.50	5.378	5.322	66	88	1289	0.65
20	0.0320	0.81	14.30	16.09	16.09	17.88	4.273	4.228	83	111	1024	0.52
21	0.0285	0.72	11.34	12.76	14.18	15.60	3.389	3.354	105	140	812	0.41
22	0.0253	0.64	8.94	10.06	11.17	12.29	2.671	2.643	133	178	640	0.32
23	0.0226	0.57	7.13	8.03	8.92	9.81	2.131	2.109	167	222	511	0.26
24	0.0201	0.51	5.64	6.35	7.05	7.76	1.686	1.668	211	281	404	0.20

BARE COPPERWELD® STRANDED CABLE, LOW CARBON AND HIGH STRENGTH PHYSICAL AND ELECTRICAL CHARACTERISTICS

(METRIC UNITS)

CONDUCTOR SIZE AWG	DIAMETER		MIN BREAKING LOADS (kgf)				WEIGHT (kg/km)		NOMINAL DC RESISTANCE at 20°C (Ω/km)		CROSS SECTION AREA	
			LOW CARBON		HIGH STRENGTH		40% COND	30% COND				
	(inch)	(mm)	40% COND	30% COND	40% COND	30% COND			40% COND	30% COND	(cmil)	(mm²)
19-Wire Strand												
19 No. 5	0.910	23.10	7823	8800	8800	9778	2660	2632	0.1372	0.1829	628665	318.55
19 No. 6	0.810	20.57	6205	6980	6980	7756	2110	2088	0.1730	0.2306	498636	252.66
19 No. 7	0.722	18.33	4923	5538	5538	6154	1674	1656	0.2180	0.2907	395627	200.47
19 No. 8	0.643	16.32	3904	4392	4392	4880	1327	1314	0.2749	0.3666	313733	158.97
19 No. 9	0.572	14.53	3094	3481	3481	3868	1052	1041	0.3469	0.4625	248660	126.00
19 No. 10	0.510	12.94	2455	2762	2762	3069	834.8	826.0	0.4372	0.5829	197289	99.97
7-Wire Strand												
7 No. 4	0.613	15.57	3636	4090	4090	4544	1231	1218	0.2941	0.3921	292169	148.04
7 No. 5	0.546	13.86	2882	3242	3242	3603	976.1	965.9	0.3709	0.4946	231613	117.36
7 No. 6	0.486	12.34	2286	2572	2572	2857	774.2	766.1	0.4677	0.6236	183708	93.09
7 No. 7	0.433	11.00	1814	2040	2040	2267	614.3	607.9	0.5894	0.7859	145757	73.86
7 No. 8	0.386	9.79	1438	1618	1618	1798	487.1	482.0	0.7433	0.9911	115586	58.57
7 No. 9	0.343	8.72	1140	1282	1282	1425	386.1	382.1	0.9378	1.2504	91612	46.42
7 No. 10	0.306	7.76	904	1017	1017	1131	306.3	303.1	1.1820	1.5760	72685	36.83
7 No. 12	0.242	6.16	574	646	646	718	192.6	190.6	1.8799	2.5066	45700	23.16
3-Wire Strand												
3 No. 4	0.440	11.18	1645	1850	1850	2056	526.7	521.2	0.6848	0.9130	125215	63.45
3 No. 5	0.392	9.96	1304	1467	1467	1630	417.5	413.2	0.8638	1.1517	99263	50.30
3 No. 6	0.349	8.87	1034	1163	1163	1293	331.2	327.7	1.0891	1.4521	78732	39.89
3 No. 7	0.311	7.90	820	923	923	1026	262.7	260.0	1.3726	1.8302	62467	31.65
3 No. 8	0.277	7.03	651	732	732	813	208.4	206.2	1.7309	2.3079	49537	25.10
3 No. 9	0.247	6.26	516	580	580	645	165.1	163.4	2.1839	2.9119	39262	19.89
3 No. 10	0.220	5.58	409	460	460	511	131.0	129.7	2.7526	3.6701	31151	15.78
3 No. 12	0.174	4.42	260	292	292	325	82.4	81.5	4.3779	5.8371	19586	9.92

Breaking load of 7-wire and 19-wire Copperweld strands are taken as 90% of the sum of the breaking loads of the individual wires;
breaking load of 3-wire Copperweld strand is taken as 95% of the sum of the breaking loads of the individual wires used in the manufacturing of the strand.

BARE SOLID COPPERWELD® WIRES, LOW CARBON AND HIGH STRENGTH PHYSICAL AND ELECTRICAL CHARACTERISTICS

(US/IMPERIAL UNITS)

CONDUCTOR SIZE AWG	DIAMETER	MIN BREAKING LOADS (lbf)				WEIGHT (lbs/kft)		NOMINAL DC RESISTANCE at 68°F (Ω/kft)		CROSS SECTION AREA	
		LOW CARBON		HIGH STRENGTH		40% COND	30% COND				
	(inch)	40% COND	30% COND	40% COND	30% COND			40% COND	30% COND	(cmil)	(in²)
2	0.2576	2023	2275	2275	2528	186.1	184.1	0.3907	0.5210	66358	0.05212
3	0.2294	1604	1805	1805	2005	147.6	146.0	0.4927	0.6569	52624	0.04133
4	0.2043	1272	1431	1431	1590	117.0	115.8	0.6212	0.8283	41738	0.03278
5	0.1819	1009	1135	1135	1261	92.77	91.81	0.7836	1.0448	33088	0.02599
6	0.1620	800	900	900	1000	73.58	72.82	0.9879	1.3173	26244	0.02061
7	0.1443	635	714	714	793	58.38	57.78	1.2452	1.6602	20822	0.01635
8	0.1285	503	566	566	629	46.30	45.82	1.5702	2.0936	16512	0.01297
9	0.1144	399	449	449	499	36.70	36.31	1.9811	2.6415	13087	0.01028
10	0.1019	316	356	356	396	29.11	28.81	2.4970	3.3293	10384	0.00816
12	0.0808	201	226	226	251	18.31	18.11	3.9713	5.2951	6529	0.00513
13	0.0720	160	180	180	200	14.54	14.38	5.0014	6.6686	5184	0.00407
14	0.0641	127	142	142	158	11.52	11.40	6.3102	8.4136	4109	0.00323
15	0.0571	100	113	113	125	9.142	9.047	7.9522	10.603	3260	0.00256
16	0.0508	79	89	89	99	7.236	7.160	10.047	13.396	2581	0.00203
17	0.0453	63	71	71	79	5.754	5.694	12.635	16.846	2052	0.00161
18	0.0403	50	56	56	63	4.554	4.506	15.964	21.286	1624	0.00128
19	0.0359	40	45	45	50	3.614	3.576	20.117	26.823	1289	0.00101
20	0.0320	32	35	35	39	2.871	2.841	25.320	33.760	1024	0.00080
21	0.0285	25	28	31	34	2.277	2.254	31.921	42.561	812	0.00064
22	0.0253	20	22	25	27	1.795	1.776	40.506	54.008	640	0.00050
23	0.0226	16	18	20	22	1.432	1.417	50.762	67.684	511	0.00040
24	0.0201	12	14	16	17	1.133	1.121	64.175	85.567	404	0.00032

COPPERWELD

BARE COPPERWELD® STRANDED CABLE, LOW CARBON AND HIGH STRENGTH
PHYSICAL AND ELECTRICAL CHARACTERISTICS

CONDUCTOR SIZE AWG	DIAMETER (inch)	MIN BREAKING LOADS (lbf)				WEIGHT (lbs/kft)		NOMINAL DC RESISTANCE at 68°F (Ω/kft)		CROSS SECTION AREA	
		LOW CARBON		HIGH STRENGTH		40% COND	30% COND	40% COND	30% COND	(cmil)	(in²)
		40% COND	30% COND	40% COND	30% COND						
19-Wire Strand											
19 No. 5	0.910	17246	19402	19402	21557	1787	1769	0.0418	0.0558	628665	0.4938
19 No. 6	0.810	13679	15389	15389	17099	1418	1403	0.0527	0.0703	498636	0.3916
19 No. 7	0.722	10853	12210	12210	13566	1125	1113	0.0665	0.0886	395627	0.3107
19 No. 8	0.643	8606	9682	9682	10758	892.0	882.7	0.0838	0.1117	313733	0.2464
19 No. 9	0.572	6821	7674	7674	8527	707.0	699.6	0.1057	0.1410	248660	0.1953
19 No. 10	0.510	5412	6089	6089	6765	560.9	555.1	0.1333	0.1777	197289	0.1550
7-Wire Strand											
7 No. 4	0.613	8015	9017	9017	10019	827.4	818.8	0.0896	0.1195	292169	0.2295
7 No. 5	0.546	6354	7148	7148	7942	655.9	649.1	0.1131	0.1507	231613	0.1819
7 No. 6	0.486	5040	5670	5670	6299	520.2	514.8	0.1425	0.1901	183708	0.1443
7 No. 7	0.433	3998	4498	4498	4998	412.8	408.5	0.1797	0.2395	145757	0.1145
7 No. 8	0.386	3171	3567	3567	3964	327.3	323.9	0.2266	0.3021	115586	0.0908
7 No. 9	0.343	2513	2827	2827	3141	259.4	256.7	0.2858	0.3811	91612	0.0720
7 No. 10	0.306	1994	2243	2243	2492	205.8	203.7	0.3603	0.4804	72685	0.0571
7 No. 12	0.242	1266	1425	1425	1583	129.4	128.1	0.5730	0.7640	45700	0.0359
3-Wire Strand											
3 No. 4	0.440	3626	4079	4079	4532	353.9	350.2	0.2087	0.2783	125215	0.0983
3 No. 5	0.392	2874	3234	3234	3593	280.5	277.6	0.2633	0.3511	99263	0.0780
3 No. 6	0.349	2280	2565	2565	2850	222.5	220.2	0.3319	0.4426	78732	0.0618
3 No. 7	0.311	1809	2035	2035	2261	176.6	174.7	0.4184	0.5578	62467	0.0491
3 No. 8	0.277	1434	1614	1614	1793	140.0	138.5	0.5276	0.7034	49537	0.0389
3 No. 9	0.247	1137	1279	1279	1421	111.0	109.8	0.6657	0.8875	39262	0.0308
3 No. 10	0.220	902	1015	1015	1128	88.0	87.1	0.8390	1.1186	31151	0.0245
3 No. 12	0.174	573	645	645	716	55.4	54.8	1.3344	1.7792	19586	0.0154

Breaking load of 7-wire and 19-wire Copperweld strands are taken as 90% of the sum of the breaking loads of the individual wires;
breaking load of 3-wire Copperweld strand is taken as 95% of the sum of the breaking loads of the individual wires used in the manufacturing of the strand.

COPPERWELD
the power of two

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