

ELEKTRISOLA

CCA10

Copper Clad Aluminum 10 %

General Description

The ELEKTRISOLA copper clad aluminum wire (CCA) is a bimetallic compound consisting of an aluminum core and a concentric copper cladding. This combination of copper and aluminum provides a wire with optimum properties of both metals. The aluminum core reduces the weight of the CCA to almost that of pure aluminum wire. Furthermore, the copper cladding increases the conductivity and provides good solderability. These properties provide a conductor optimal for high quality coils used in headphones, headsets, loudspeakers and many other applications in which coil weight reduction is desired.

Features

- Low density allows coil weight reduction
- Easy soldering due to copper cladding
- Higher conductivity compared to aluminum

Applications

- Voice coils (e.g. in headphone, headset, ...)
- VCM coils for HDD actuator
- Loudspeakers

Electrical Characteristics (Note 1)

Symbol	Parameter	Min (Note 3)	Typ (Note 2)	Max (Note 3)	Units
χ	Conductivity		37.4		S*m/mm ²
ρ	Resistivity		0.0267		Ω *mm ² /m
α	Thermal coefficient of resistance	3800	4000	4200	10E-6/K
	Resistance (IACS)		64		%

Mechanical Characteristics (Note 1)

Symbol	Parameter	Min (Note 3)	Typ (Note 2)	Max (Note 3)	Units
σ_T	Tensile strength	130	155	180	N/mm ²
$\sigma_{Y1\%}$	Yield strength at 1%	100	120	140	N/mm ²
ε	Elongation	5	15	25	%
BPP	Bending proof performance (Note 4)		60		%

Physical Characteristics (Note 1)

Symbol	Parameter	Min (Note 3)	Typ (Note 2)	Max (Note 3)	Units
ρ	Density		3.2		kg/dm ³
CC	Copper cladding in percentage of cross-section		10		%

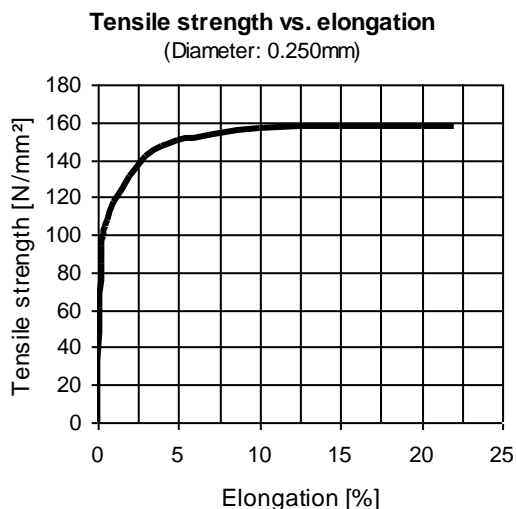
Note 1: Unless otherwise specified, all limits are guaranteed for annealed and enameled wire at $T_A = 20^\circ\text{C}$ and measured according international standard IEC 851 as far as applicable.

Note 2: Typical Values represent the most likely parametric norm.

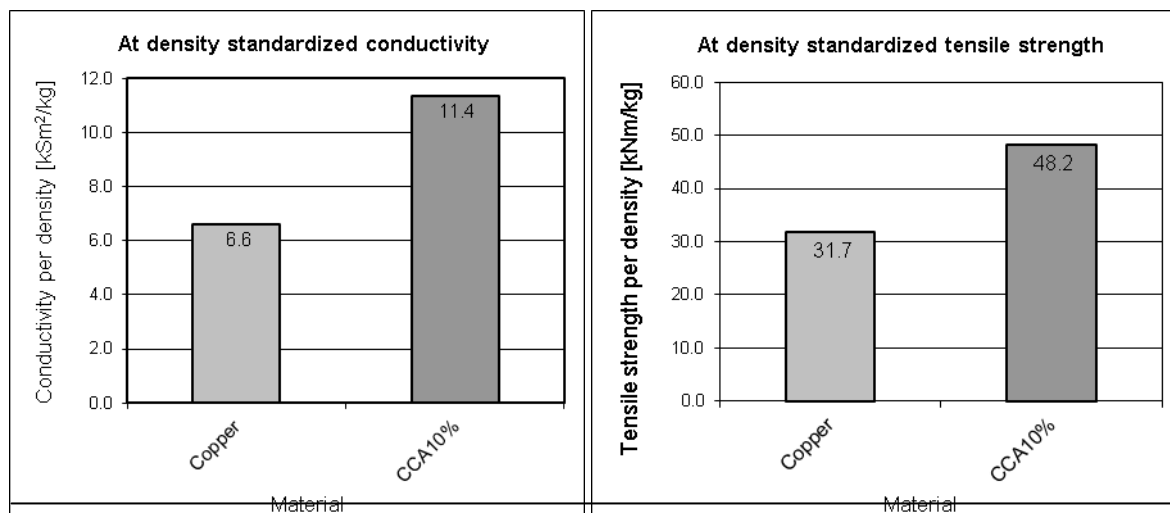
Note 3: All limits are guaranteed by testing or statistical analysis.

Note 4: BPP tests are conducted with a 0.100mm hard drawn bare wire according ELEKTRISOLA internal specification. The value specifies the Time To Fracture (TTF) compared to copper (100%) under these test conditions.

Typical Performance Characteristics



CCA10% vs. Copper



BANNED SUBSTANCES COMPLIANCE

ELEKTRISOLA FEINDRAHT AG certifies that the products and packing materials meet the provision from the European Union for the Restriction of certain Hazardous Substances (RoHS) and the directive for Waste from Electrical and Electronic Equipment (WEEE).

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Annex A Electrical Resistance

The limits of electrical resistance are derived from the calculations made in IEC standard 317-0-1 Annex C.1 "Method for the calculation of linear resistance" for copper wire and are restricted by a factor of 2.

Nom. Diameter [mm]	AWG	Min [Ω/m]	Nominal [Ω/m]	Max [Ω/m]
0.0098	58	316.5	351.7	386.8
0.0101		298.0	331.1	364.2
0.0109	57	255.8	284.3	312.7
0.0113		238.0	264.5	290.9
0.0120		211.1	234.5	258.0
0.0125	56	194.5	216.1	237.8
0.0130	55.5	179.9	199.8	219.8
0.0135	55	166.8	185.3	203.8
0.0140		155.1	172.3	189.5
0.0145	54.5	144.6	160.6	176.7
0.0155	54	126.5	140.6	154.6
0.0160		118.7	131.9	145.1
0.0165	53.5	111.6	124.1	136.5
0.0170		105.2	116.9	128.5
0.0175	53	99.25	110.3	121.3
0.0180		93.81	104.2	114.7
0.0185	52.5	88.81	98.68	108.5
0.0190		84.20	93.55	102.9
0.0195	52	79.94	88.82	97.70
0.0200		75.99	84.43	92.88
0.0210	51.5	68.92	76.58	84.24
0.0215		65.76	73.06	80.37
0.0220	51	62.80	69.78	76.76
0.0230	50.5	57.46	63.84	70.23
0.0240		52.77	58.63	64.50
0.0245	50	50.64	56.26	61.89
0.0250		48.63	54.04	59.44
0.0260	49.5	44.96	49.96	54.96
0.0270		41.69	46.33	50.96
0.0275	49	40.19	44.66	49.12
0.0280		38.77	43.08	47.39
0.0290	48.5	36.14	40.16	44.17
0.0300		33.77	37.53	41.28
0.0310	48	31.63	35.14	38.66
0.0320		29.68	32.98	36.28
0.0330	47.5	28.00	31.01	34.02
0.0340		26.38	29.22	32.05
0.0350	47	24.90	27.57	30.24
0.0360		23.53	26.06	28.59
0.0370	46.5	22.28	24.67	27.06
0.0380		21.12	23.39	25.66
0.0381	46.1	21.01	23.27	25.52
0.0390	46.0	20.05	22.20	24.36
0.0400		19.06	21.11	23.16
0.0410	45.5	18.14	20.09	22.04
0.0420		17.29	19.15	21.00

Nom. Diameter [mm]	AWG	Min [Ω/m]	Nominal [Ω/m]	Max [Ω/m]
0.0430		16.494	18.27	20.04
0.0437		15.970	17.69	19.40
0.0440	45	15.753	17.44	19.14
0.0450		15.06	16.68	18.30
0.0460		14.41	15.96	17.51
0.0470	44.5	13.91	15.29	16.66
0.0480		13.34	14.66	15.98
0.0490		12.80	14.07	15.33
0.0500	44	12.29	13.51	14.72
0.0520	43.5	11.37	12.49	13.61
0.0530		10.94	12.02	13.11
0.0550	43	10.16	11.16	12.17
0.0560		9.800	10.77	11.74
0.0580		9.136	10.04	10.94
0.0600	42.5	8.631	9.381	10.13
0.0620		8.083	8.786	9.489
0.0630	42	7.828	8.509	9.190
0.0650	41.5	7.241	7.994	8.861
0.0670		6.834	7.523	8.316
0.0680		6.642	7.304	8.062
0.0700	41	6.283	6.892	7.588
0.0710		6.115	6.700	7.366
0.0740		5.648	6.167	6.757
0.0750	40.5	5.504	6.004	6.571
0.0780	40	5.104	5.551	6.055
0.0800		4.861	5.277	5.745
0.0830	39.5	4.527	4.902	5.322
0.0850		4.324	4.674	5.066
0.0880	39	4.044	4.361	4.714
0.0900		3.871	4.169	4.500
0.0930	38.5	3.633	3.905	4.205
0.0950		3.486	3.742	4.024
0.1000		3.156	3.377	3.620
0.101	38.0	3.096	3.311	3.547
0.106	37.5	2.818	3.006	3.211
0.110		2.622	2.791	2.975
0.112		2.532	2.692	2.867
0.113	37	2.488	2.645	2.815
0.115		2.405	2.554	2.715
0.118	36.5	2.287	2.426	2.576
0.120		2.213	2.345	2.488
0.125		2.044	2.161	2.288
0.126	36	2.012	2.127	2.251
0.130		1.893	1.998	2.112
0.132		1.837	1.938	2.047
0.134	35.5	1.784	1.881	1.985

Annex A

Electrical Resistance (Continued)

Nom. Diameter [mm]	AWG	Min [Ω/m]	Nominal [Ω/m]	Max [Ω/m]
0.138		1.684	1.773	1.869
0.140		1.637	1.723	1.815
0.141	35	1.615	1.699	1.789
0.149	34.5	1.449	1.521	1.598
0.150		1.430	1.501	1.576
0.159	34.0	1.276	1.336	1.400
0.160		1.260	1.319	1.382
0.169	33.5	1.132	1.182	1.236
0.170		1.119	1.169	1.221
0.179	33	1.011	1.054	1.100
0.180		1.000	1.042	1.087
0.189		0.9083	0.9455	0.9846
0.190	32.5	0.8989	0.9355	0.9741
0.200		0.8125	0.8443	0.8777
0.202	32	0.7968	0.8277	0.8601
0.210		0.7380	0.7658	0.7949
0.212	31.5	0.7244	0.7514	0.7798
0.220		0.6733	0.6978	0.7233
0.222		0.6614	0.6853	0.7102
0.224		0.6498	0.6731	0.6974
0.225	31	0.6385	0.6671	0.6974
0.230		0.6115	0.6384	0.6669
0.236		0.5813	0.6064	0.6328
0.239		0.5671	0.5913	0.6168
0.240	30.5	0.5624	0.5863	0.6116
0.250		0.5190	0.5404	0.5629
0.253	30	0.5070	0.5276	0.5494
0.260		0.4804	0.4996	0.5197
0.265		0.4627	0.4809	0.5000
0.268	29.5	0.4526	0.4702	0.4887

Nom. Diameter [mm]	AWG	Min [Ω/m]	Nominal [Ω/m]	Max [Ω/m]
0.270		0.4460	0.4633	0.4814
0.280		0.4151	0.4308	0.4471
0.286	29	0.3981	0.4129	0.4283
0.290		0.3874	0.4016	0.4164
0.295		0.3745	0.3881	0.4022
0.300		0.3623	0.3753	0.3888
0.301	28.5	0.3599	0.3728	0.3861
0.315		0.3290	0.3404	0.3522
0.319	28	0.3209	0.3319	0.3433
0.335		0.2914	0.3009	0.3109
0.339	27.5	0.2846	0.2939	0.3035
0.345		0.2749	0.2837	0.2929
0.350		0.2672	0.2757	0.2845
0.355		0.2598	0.2680	0.2765
0.360	27	0.2513	0.2606	0.2703
0.375		0.2319	0.2402	0.2488
0.380	26.5	0.2259	0.2339	0.2422
0.383		0.2224	0.2302	0.2384
0.390		0.2146	0.2220	0.2298
0.400		0.2041	0.2111	0.2183
0.402	26	0.2021	0.2090	0.2161
0.420		0.1854	0.1915	0.1978
0.425		0.1811	0.1870	0.1931
0.427	25.5	0.1794	0.1852	0.1913
0.450		0.1617	0.1668	0.1720
0.453	25	0.1596	0.1646	0.1697
0.475		0.1453	0.1497	0.1542
0.481	24.5	0.1418	0.1460	0.1503
0.500		0.1313	0.1351	0.1390
0.508	24	0.1267	0.1309	0.1352