

# Copper Clad Aluminum and Other Clad Metals

Clad metals are two distinct metals or alloys that are metallurgically bonded together so that the optimum combination of functional properties is achieved. Copper Clad Aluminum (CCA) is an electrical conductor with a sleeve of copper bonded to a solid aluminum core. The composite wire is uniquely suited to electrical applications where weight to conductivity issues are critical. The copper makes up either 10% or 15% of the cross sectional area of the wire and assures excellent solderability. AC conductivity at frequencies greater than 5 MHz is equal to solid copper. CCA is manufactured in accordance with the requirements of ASTM B-566. Film insulations are available on CCA wire. For insulation data, see pages 2 and 3.

## Typical Physical Properties

	10%CCA	15%CCA
DC Conductivity	62.9% min IACS	64.4% min IACS
% Copper by volume	8-12%	13-17%
% Copper by weight	27% nom	34% nom
Density	.120 lb/cu in	.131 lb/cu in
Tensile strength, annealed	20-25 kPSI	20-25 kPSI
Tensile strength, hard drawn	16-30 kPSI	16-30 kPSI
Elongation, annealed	5-15% min	5-15% min
Elongation, hard drawn	1% min	1% min

*(Tensile and elongation values are size dependent)*

SIZE (AWG)	DIAMETER (INCHES)	AREA (CIR. MILS)	FEET PER POUND		POUNDS PER 1000 FT.		OHMS PER 1000 FT. AT 20°C		SIZE (AWG)
			10% CCA	15% CCA	10% CCA	15% CCA	10% CCA	15% CCA	
14	.0641	4109	215	197	4.64	5.06	3.91	3.79	14
15	.0571	3260	270	247	3.69	4.03	4.93	4.78	15
16	.0508	2581	342	314	2.92	3.19	6.23	6.05	16
17	.0453	2052	430	394	2.32	2.53	7.83	7.60	17
18	.0403	1624	542	497	1.84	2.01	9.90	9.61	18
19	.0359	1289	684	627	1.46	1.59	12.5	12.1	19
20	.0320	1024	862	791	1.16	1.26	15.7	15.2	20
21	.0285	812.3	1087	997	.920	1.00	19.8	19.2	21
22	.0253	640.1	1378	1264	.726	.792	25.1	24.4	22
23	.0226	510.8	1728	1585	.580	.632	31.5	30.5	23
24	.0201	404.0	2184	2004	.456	.498	39.8	38.6	24
25	.0179	320.4	2750	2524	.363	.396	50.2	48.7	25
26	.0159	252.8	3498	3210	.286	.312	63.6	61.7	26
27	.0142	201.6	4378	4018	.228	.249	79.7	77.3	27
28	.0126	158.8	5554	5096	.180	.196	101	98.2	28
29	.0113	127.7	6915	6346	.145	.158	126	122	29
30	.0100	100.0	8811	8085	.113	.124	161	156	30
31	.0089	79.21	11134	10216	.0896	.0979	203	197	31
32	.0080	64.00	13777	12642	.0726	.0792	251	244	32
33	.0071	50.41	17488	16048	.0572	.0624	319	310	33
34	.0063	39.69	22214	20384	.0449	.0490	405	390	34
35	.0056	31.36	28035	25725	.0355	.0387	513	498	35
36	.0050	25.00	35244	32340	.0283	.0309	643	624	36
37	.0045	20.25	43521	39935	.0229	.0250	794	770	37
38	.0040	16.00	55002	50470	.0181	.0196	1000	975	38
39	.0035	12.25	72090	66150	.0139	.0151	1310	1280	39
40	.0031	9.610	91848	84280	.0109	.0119	1670	1620	40

## Other Clad Metals

WIRE	CORE/CLADDING	% IACS	KEY ATTRIBUTES	TYPICAL APPLICATIONS
CCS 30%	Low carbon Steel/Copper	30%	High strength, medium conductivity	Drop wire, grounding conductor
CCS 40%	Low carbon Steel/Copper	40%	High strength, medium conductivity	High strength conductors, electronic wire leads
NCC 27%	Copper/Pure Nickel	70% nom.	Combines high conductivity and oxidation resistance at elevated temperatures	High temperature electrical conductors, leadwire to heating elements
Dumet	Nickel-Iron Alloy/Copper	Approx. 17%	Thermal expansion equal to that of glass	Electronic wire leads