

## Copper Clad Aluminum (CCA) 10% Products



Copper Clad Aluminum Wire

Copper Clad Aluminum is an electrical conductor that has an outer sleeve of copper metallurgically bonded to a solid aluminum core. The combination of these two metals make it uniquely suited to many electrical applications where weight to conductivity issues are important.

This bimetallic wire is much lighter than solid copper and only slightly heavier than bare aluminum. The density of the CCA is 0.120 lbs/in<sup>3</sup> (3.318 g/cc) or approximately 2.7 times lighter than copper and 1.26% heavier than aluminum. It is more robust than an aluminum conductor and does not creep at a mechanical connection.

Copper Clad Aluminum, besides being drawn into round conductors, can also be easily formed into simple or compound shapes. Because the two metals are metallurgically bonded at their interface they share the properties of both metals that readily accept the new form or shape. CCA is light-weight and is easy to handle and install. The copper on the outside allows for better connections including brazing.

CCA conducts like solid copper for AC frequencies greater than 5 MHz. This product meets or exceeds the minimum requirements set forth in ASTM B-566 (2004).

### Advantages:

- Lower cost alternative to using solid copper
- Conductivity of copper
- Lighter weight of aluminum
- High mechanical strength and flexibility
- Corrosion resistant
- No scrap value (theft deterrent)



CCA used for computer hard drive

### Product Summary & Specification

Attribute	ASTM B-566 (2004)
Core	Aluminum
Cladding	Copper
Density	0.120 lbs/ in <sup>3</sup> (3.318 gm/cm <sup>3</sup> )
AC Conductivity >5MHz	Equal to Copper
DC Conductivity	62.9% min
% Copper by Area	10% nom
% Copper by Weight	27% nom
Tensile Strength Annealed	20 ksi (138 MPa)
Tensile Strength as Drawn	36 ksi (249 MPa)



CCA used for power cables

## Physical & Mechanical Properties of 10% Copper Clad Aluminum

AWG*	Diameter in / (mm)		Area in <sup>2</sup> / (mm <sup>2</sup> )		Minimum Copper Thickness in / (mm)		CCA Weight lb / k-ft (kg / km)		CCA ohms / k-ft* (ohms / km)		Equal Resistance Cu CCA Diameter** in / (mm)	
<b>1/0</b>	0.3249	(8.25)	0.08291	(53.49)	0.0081	(0.2054)	119.39	(177.60)	0.156	(0.512)	0.4097	(10.41)
<b>1</b>	0.2893	(7.35)	0.06572	(42.40)	0.0072	(0.1829)	94.64	(140.79)	0.197	(0.646)	0.3647	(9.26)
<b>2</b>	0.2576	(6.54)	0.05212	(33.63)	0.0064	(0.1629)	75.06	(111.65)	0.248	(0.815)	0.3248	(8.25)
<b>3</b>	0.2294	(5.83)	0.04134	(26.67)	0.0057	(0.1450)	59.52	(88.55)	0.313	(1.028)	0.2893	(7.35)
<b>4</b>	0.2043	(5.19)	0.03278	(21.15)	0.0051	(0.1292)	47.21	(70.22)	0.395	(1.296)	0.2576	(6.54)
<b>5</b>	0.1819	(4.62)	0.02600	(16.77)	0.0045	(0.1150)	37.44	(55.69)	0.498	(1.634)	0.2294	(5.83)
<b>6</b>	0.1620	(4.12)	0.02062	(13.30)	0.0040	(0.1024)	29.69	(44.16)	0.628	(2.061)	0.2043	(5.19)
<b>7</b>	0.1443	(3.66)	0.01635	(10.55)	0.0036	(0.0912)	23.54	(35.02)	0.792	(2.598)	0.1819	(4.62)
<b>8</b>	0.1285	(3.26)	0.01297	(8.37)	0.0032	(0.0812)	18.67	(27.78)	0.999	(3.277)	0.1620	(4.12)
<b>9</b>	0.1144	(2.91)	0.01028	(6.63)	0.0028	(0.0723)	14.81	(22.03)	1.259	(4.132)	0.1443	(3.66)
<b>10</b>	0.1019	(2.59)	0.00816	(5.26)	0.0025	(0.0644)	11.74	(17.47)	1.588	(5.210)	0.1285	(3.26)
<b>11</b>	0.0907	(2.30)	0.00647	(4.17)	0.0023	(0.0574)	9.31	(13.85)	2.002	(6.569)	0.1144	(2.91)
<b>12</b>	0.0808	(2.05)	0.00513	(3.31)	0.0020	(0.0511)	7.39	(10.99)	2.525	(8.284)	0.1019	(2.59)
<b>13</b>	0.0720	(1.83)	0.00407	(2.62)	0.0018	(0.0455)	5.86	(8.71)	3.184	(10.445)	0.0907	(2.30)
<b>14</b>	0.0641	(1.63)	0.00323	(2.08)	0.0016	(0.0405)	4.65	(6.91)	4.014	(13.171)	0.0808	(2.05)
<b>15</b>	0.0571	(1.45)	0.00256	(1.65)	0.0014	(0.0361)	3.68	(5.48)	5.062	(16.608)	0.0720	(1.83)
<b>16</b>	0.0508	(1.29)	0.00203	(1.31)	0.0013	(0.0321)	2.92	(4.35)	6.383	(20.942)	0.0641	(1.63)
<b>17</b>	0.0453	(1.15)	0.00161	(1.04)	0.0011	(0.0286)	2.32	(3.45)	8.049	(25.407)	0.0571	(1.45)
<b>18</b>	0.0403	(1.02)	0.00128	(0.82)	0.0010	(0.0255)	1.84	(2.73)	10.149	(32.298)	0.0508	(1.29)
<b>19</b>	0.0359	(0.91)	0.00101	(0.65)	0.0009	(0.0227)	1.46	(2.17)	12.798	(41.987)	0.0453	(1.15)
<b>20</b>	0.0320	(0.81)	0.00080	(0.52)	0.0008	(0.0202)	1.16	(1.72)	16.137	(52.944)	0.0403	(1.02)

\*American Wire Gauge

\*\*Resistance values were calculated using: Copper = 100.0% IACS  
Aluminum = 61.3%  
CCA = 65.0% IACS



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