PRODUCT DATA SHEET

Copper Clad Steel Cables

One Bridge Plaza North Suite 260 | Fort Lee, NJ 07024 | Tel 201 242 9906 | Fax 201 242 9926

Scope: Copper Clad Steel wire and strand has been utilized and relied upon for years as a strong, non-rusting, efficient grounding conductor. Combining the strength of steel with the conductivity and corrosion resistance of copper, Copper Clad Steel wire and strand provides a long-lasting, low impedance path to the earth. It is also less susceptible to theft because it is a bimetallic product and does not have the high scrap value of solid copper. When annealed, Copper Clad Steel wire and strand exhibits the flexibility necessary for easy handling.

To eliminate the possibility of damage from lightning strikes or short-circuit conditions, an efficient, reliable grounding system is necessary to rapidly dissipate the surge current to ground. Whatever the grounding application may be, there is a Copper Clad Steel conductor available in the size, conductivity and strength that is required.

Applications

Grounding Conductors for Primary Surge Arresters
Selecting Dead Soft Annealed (DSA) Copper Clad Steel wire as the grounding conductor for primary surge arresters permits a continuous length of conductor to be installed from the arrester to the buried grounding electrode. This is a practice which is not usually recommended with aluminum conductors. The steel core of the DSA Copper Clad Steel ground wire provides a rugged lead. It can withstand more mechanical abuse and is less susceptible to vibration-induced fatigue than solid copper or aluminum wire.

When DSA Copper Clad Steel wire is used in place of copper, the grounding conductor is far less likely to be stolen. This feature is important not only from an economic standpoint, but also from the standpoint of safety and reliability. Often, the fact that a copper downlead has been removed is not evident until a surge current causes a failure in the system.

Pole Ground Wire
DSA Copper Clad Steel wire is ideally suited as a downlead on transmission or distribution lines using wood, concrete, or fiberglass poles. Although mechanically strong, the pliability of DSA Copper Clad Steel wire permits the downlead to be easily formed from the connection at the overhead ground wire, along the pole and down to the buried electrode.

On metal transmission towers, short lengths of DSA Copper Clad Steel wire are often used to connect the tower legs to driven electrodes.

Other Applications
- Substation ground grid wire and fence grounds
- Building lightning protection
- Structure ground leads

Physical Characteristics

Conductor Configuration		Nominal Diameter		Minimum Breaking Strength		Nominal Weight		Cross Sectional Area	
Stranding	AWG	IN	mm	Lbs	Kg	LBS/1000	Kg/km	Circular mils	mm2
30% Conductivity									
1	2	0.2576	6.54	2,606	1,182	181.9	270.7	66,360	33.62
1	4	0.2043	5.19	1,639	743	114.4	170.2	41,740	21.15
1	6	0.1620	4.11	1,031	467	71.9	1107.0	26,240	13.29
3	5	0.392	9.96	4,680	2,123	277.8	413.4	99,310	50.31
3	6	0.349	8.86	3,710	1,683	220.3	327.8	78,750	39.89
3	7	0.311	7.90	2,940	1334	174.7	206.1	62,450	31.64
3	8	0.277	7.04	2,330	1,057	138.5	206.1	49,530	25.09
3	9	0.247	6.27	1,850	839	109.9	163.5	39,280	19.90

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3	10	2.220	5.59	1,470	667	87.1	129.6	31,150	15.78
7	5	0.5457	13,861	9,095	4,126	634.8	944.7	231,630	117.34
7	6	0.4860	12.344	7,214	3,272	503.5	749.3	183,680	93.05
7	7	0.4329	10.966	5,724	2,596	399.5	594.5	145,740	73.83
7	9	0.3432	9.792	4,539	2,059	316.8	471.4	115,570	58.55
7	10	0.3057	7.765	3,598	1,632	251.1	373.7	91,630	46.42
19	5	0.9095	23.101	24,688	11,198	199.2	296.5	72,660	36.81
19	6	0.8100	20.574	19,581	8,882	1,366.6	2,033.8	498,560	252.57
19	7	0.7215	18.326	15,536	7,047	1,084.3	1,613.6	395,580	200.40
19	8	0.6425	16.319	12,320	5,588	859.9	1,279.6	313,690	158.92
19	9	0.5720	14.529	9,765	4,429	681.5	1,014.2	248,710	126.00
40% Conductivity									
1	2	0.2576	6.54	2,345	1,064	183.9	273.7	66,360	33.62
1	4	0.2043	5.19	1,475	669	115.7	172.7	41,740	21.15
1	6	0.1620	4.11	928	421	72.7	108.3	26,240	13.29
3	5	0.392	9.96	3,900	1,769	277.8	413.4	99,310	50.31
3	6	0.349	8.86	3,090	1,402	200.3	327.8	78,750	39.89
3	7	0.311	7.90	2,450	1,112	174.7	260.0	62,450	31.64
3	8	0.277	7.04	1,950	885	138.5	206.1	49,530	25.09
3	9	0.247	6.27	1,540	699	109.9	163.5	39,280	19.90
3	10	0.220	5.59	1,220	554	87.1	129.6	31,150	15.78
7	5	0.5457	13.861	8,186	3,713	642.0	955.4	231,630	117.34
7	6	0.4860	12.344	6,493	2,945	509.2	757.8	183,630	93.05
7	7	0.4329	10.966	5,152	2,337	404.0	601.2	145,740	73.83
7	8	0.3855	9.792	4,085	1,853	320.4	476.8	115,570	58.55
7	9	0.3432	8.717	3,238	1,469	253.9	377.9	91,630	46.42
7	10	0.3057	7.765	2,569	1,165	201.5	299.8	72,660	36.81
19	5	0.9095	23.101	22,219	10,078	1,742.6	2,593.2	628,710	318.50
19	6	0.8100	20.574	17,623	7,994	1,382.1	2,056.9	498,560	252.57
19	7	0.7215	18.326	13,983	6,342	1,096.6	1,632.0	395,580	200,40
19	8	0.6426	16.319	11,088	5,030	869.6	1,294.1	313,690	158.92
19	9	0.5720	14.529	8,788	3,966	689.2	1,025.7	248,710	126.00

Approximate Short-Time Fusing Currents of Dead Soft Annealed Copper Clad Steel Conductors

Conductor Size AWG	Duration of Current in Cycles or Seconds					
	3 Cycles (.05 second)	6 Cycles (.10 second)	9 Cycles (.15 second)	30 Cycles (.5 second)	60 Cycles (1.0second)	120 Cycles (2.0 seconds)
	Current in Amperes					
40% Conductivity						
19 No. 5	330,000	234,000	191,000	104,000	74,000	52,000
19 No.6	262,000	185,000	161,000	83,000	59,000	41,000
19 No.7	208,000	147,000	121,000	66,000	46,000	33,000
19 No.8	165,000	117,000	95,000	52,000	37,000	26,000
19 No.9	131,000	92,000	75,000	41,000	29,000	21,000

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7 No. 4	154,000	109,000	89,000	49,000	34,000	24,000
7 No. 5	122,000	86,000	70,000	38,000	27,000	19,000
7 No.6	97,000	68,000	56,000	31,000	22,000	15,000
7 No. 7	77,000	54,000	44,000	24,000	17,000	12,000
7 No. 8	61,000	43,000	35,000	19,000	14,000	10,000
7 No.9	48,000	34,000	28,000	15,000	11,000	7,600
7 No. 10	38,000	27,000	22,000	12,000	8,500	6,000
No. 2 Wire	35,000	25,000	20,000	11,000	7,800	5,500
No. 4 Wire	22,000	16,000	13,000	6,900	4,900	3,500
No. 6 Wire	14,000	9,600	8,000	4,400	3,100	2,200
30% Conductivity						
19 No. 5	294,000	208,000	170,000	93,000	66,000	47,000
19 No. 6	233,000	165,000	135,000	74,000	52,000	37,000
19 No. 7	185,000	131,000	107,000	58,000	41,000	29,000
19 No. 8	147,000	104,000	85,000	46,000	33,000	23,000
19 No. 9	116,000	82,000	67,000	37,000	26,000	18,000
7 No. 4	137,000	97,000	79,000	43,000	31,000	22,000
7 No.5	108,000	77,000	63,000	34,000	24,000	17,000
7 No. 6	86,000	61,000	50,000	27,000	19,000	14,000
7 No. 7	68,000	48,000	39,000	22,000	15,000	11,000
7 No. 8	54,000	38,000	31,000	17,000	12,000	9,000
7 No. 9	43,000	30,000	25,000	14,000	9,600	6,800
7 No. 10	34,000	24,000	20,000	11,000	7,600	5,400
No. 2 Wire	31,000	22,000	18,000	9,800	6,900	4,900
No. 4 Wire	20,000	14,000	11,000	6,200	4,400	3,100
No.6 Wire	12,000	9,000	7,100	3,900	2,700	1,900

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