



ERICO®

ERICO® CU-BOND Round Conductor



Substation earthing riser

For decades, ERICO® has provided the market with high quality copper-bonded ground rods. ERICO has taken that same concept in ground rods and made this into a revolutionary new grounding conductor. The ERICO CU-BOND Round Conductor is comprised of an electro-plated coating of copper deposited over a layer of nickel surrounding a steel core. This process helps ensure a long-lasting molecular bond between the copper layer and the steel.

The conductor core consists of a low-carbon steel grade for improved flexibility in the field. The copper surface of the conductor provides high conductivity and corrosion-resistance properties.

Features

- Copper-bonded coating will not crack or tear when the conductor is bent
- High resistance to corrosion and provides a low resistance path to Earth
- Available in standard packaging lengths of 100 meters, 50 meters, and 25 meters
- Minimum copper plating thickness of 254 microns
- Available in nominal diameters of 8, 10, 13, 14, 16, and 18 mm
- Meets the requirements of IEC® 62305-3 Edition 2 and IEC/EN 62561-2 for lightning protection applications

Benefits As An Alternative To Copper Conductor

- **Theft-deterrent:** Copper theft is a problem everywhere. ERICO CU-BOND Round Conductor is hard to cut with hand tools due to its steel core. They are also magnetic, notifying potential thieves that the materials within are of little scrap value.
- **Cost-effective:** Because the copper is bonded to a steel core, the cost of the conductor is minimized by reducing the total amount of copper in the cable.

Benefits As An Alternative To Galvanized Steel Conductor

- **Superior corrosion resistance:** In comparison to other steel-based products, ERICO CU-BOND Round Conductor provides excellent application life of typically 30-40 years in most soil conditions.



Equipotential grounding conductor



GT ERICO® CADWELD® connection





Lightning protection

Above Grade Applications

The unique properties of ERICO CU-BOND Round Conductor make it ideal for both horizontal and vertical placement. Above grade, the conductor is well-suited as a lightning-protection conductor when applied in accordance with the IEC 62305-3 Edition 2.0 standard.

- **Utility**
 - Distribution down-lead conductor and assemblies
 - Bonding kits for substation fence or equipment ground risers back to the grid
- **Commercial and Industrial**
 - Alternative conductors to solid copper rod and tapes in grounding and lightning protection
- **Telecom**
 - Conductor for connecting equipment ground to ground grid, and riser (down-lead) conductors for tower
 - Grounding conductor for datacenter mesh bonding
- **Rail**
 - Trackside bonding conductor and stray current conductor
 - Grounding kits for trackside equipment, electrical traction power
 - Substation, wayside shelters, communication antenna equipment



Telecom tower grounding

Below Grade Applications

Copper-bonded steel conductors are ideal as earthing and bonding conductors where copper theft on-site may occur. ERICO CU-BOND is ideal for use in a variety of applications including power distribution earthing and bonding; substation earthing; commercial, industrial, and railway earthing.

- Buried ground grid conductors and electrodes:
 - Wireless telecom tower earthing
 - Utility substation earthing; power distribution and transmission earthing
 - Large scale ground mount solar farm earthing
 - Industrial facility earthing, for example, petrochemical and mining infrastructure
 - Railway earthing
- Interconnecting grounding conductor between wind towers or grounding grid at base of wind tower

ERICO® CU-BOND Round Conductor



Cross-Sectional Area

Product Code	CBSC8	CBSC10	CBSC13	CBSC14	CBSC16	CBSC18
Conductor Cross Section in mm ²	50.27	78.52	138.07	158.90	199.84	243.27
Conductor Cross Section in in ²	0.08	0.12	0.21	0.25	0.31	0.38

General Product Information

Product Code	Coil Length (Meters)	Coil Length (Feet)	Coil Weight (Kg)	Coil Weight (Lbs)
CBSC8	100	328	39.0	86.6
CBSC8A	25	82	9.7	21.7
CBSC8B	50	164	19.5	43.3
CBSC10	100	328	62.7	139.4
CBSC10A	25	82	15.7	34.9
CBSC10B	50	164	31.4	69.7
CBSC13	100	328	107.6	239.0
CBSC13A	25	82	26.9	59.8
CBSC13B	50	164	53.8	119.5
CBSC14	100	328	125.0	277.7
CBSC14A	25	82	31.2	69.4
CBSC14B	50	164	62.5	138.9
CBSC16	100	328	149.6	332.5
CBSC16A	25	82	37.4	83.1
CBSC16B	50	164	74.8	166.3
CBSC18	100	328	192.2	427.0
CBSC18A	25	82	48.0	106.8
CBSC18B	50	164	96.1	213.5

Conductor Diameter Comparison

Conductor Size	Approx Diameter (inches)	Approx Diameter (mm)
#4AWG	.235	5.97
25mm ²	.266	6.76
#2 AWG	.292	7.42
35mm ²	.301	7.65
CBSC8	.315	8.00
50mm ²	.350	8.89
1/0 AWG	.373	9.47
CBSC10	.394	10.00
2/0 AWG	.419	10.64
70mm ²	.421	10.69
3/0 AWG	.410	10.40
95mm ²	.490	12.47
CBSC13	.520	13.20
4/0 AWG	.528	13.41
CBSC14	.560	14.20
120mm ²	.560	14.22
250 MCM	.575	14.61
CBSC16	.618	15.70
150mm ²	.620	15.75
300 MCM	.629	15.98
185mm ²	.695	17.65
CBSC18	.697	17.70

Electrical Fusing Current Comparison

Part Number (100 meter length)	Actual Size (mm)	Copper Wire Equivalent	
		AWG	Metric Approximation
CBSC8	8.0	#4	25mm ²
CBSC10	10.0	#2	35mm ²
CBSC13	13.2	1/0	50mm ²
CBSC14	14.2	2/0	70mm ²
CBSC16	15.7	3/0	80mm ²
CBSC18	17.7	4/0	95mm ²

*Reference only; AWG size calculations based on IEEE80 for copper-bonded steel rod (10mils; 254 microns). Time duration .5s, X/R=0.

Electrical equivalents to metric copper cables not listed in IEEE80, estimations only.

Conductivity Comparison

Part Number	AWG (Ω/km)	CBSC Resistance per Length Comparison†	Metric (Ω/km)	CBSC Resistance per Length Comparison†
CBSC18	1/0AWG	118.52%	50mm ²	110.82%
	2AWG	74.54%	35mm ²	77.57%
CBSC16	2AWG	102.20%	35mm ²	106.36%
	4AWG	64.27%	25mm ²	75.97%
CBSC14	2AWG	137.78%	25mm ²	102.42%
	4AWG	86.65%	16mm ²	65.55%
CBSC13	2AWG	134.46%	25mm ²	99.95%
	4AWG	84.56%	16mm ²	63.97%
CBSC10	4AWG	132.25%	16mm ²	100.05%
	6AWG	83.17%	10mm ²	62.53%
CBSC8	6AWG	107.85%	16mm ²	129.73%
	8AWG	67.83%	10mm ²	81.08%

† Resistance per unit length measurements made in mΩ/m, CBSC compared with respect to AWG/ Metric. To determine the %, the following formula was used:

$$\% = \frac{\frac{R}{L} \text{ CBSC}}{\frac{R}{L} \text{ AWG}}$$



IEEE® 837 Standards:

The IEEE 837 standard (Annex C) provides a method of calculating the fusing current for conductors. The following chart is a reference of the calculations for copper-bonded steel conductor according to the IEEE 837 standard. This information is for reference only.

$$I = A \sqrt{\frac{\ln \left(\frac{K_0 + T_m}{K_0 + T_a} \right)}{\beta I_c}} \text{ in kA}$$

$$\beta = \frac{\alpha_r \cdot \rho_r \cdot 10^4}{TCAP}$$

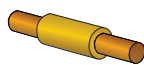


Fusing Current I_{rms} (kA) - IEEE® 837 Annex C							
Conductor Type Copper-bonded, Steel Core, Rod _a		CBSC8	CBSC10	CBSC13	CBSC14	CBSC16	CBSC18
Conductor Cross Section in mm ²	A	50.265	78.520	138.070	158.903	199.840	243.270
Initial Conductor Temperature in °C	T _a	40	40	40	40	40	40
Time of Current Flow in Seconds	t _c	2	2	2	2	2	2
Maximum Allowable Temperature in °C	T _m	1084	1084	1084	1084	1084	1084
Thermal Coefficient of Resistivity at Reference Temperature T _r	a _r	0.00378	0.00378	0.00378	0.00378	0.00378	0.00378
Resistivity of the Ground Conductor at Reference Temperature T _r in mΩ-cm	r _r	8.621	8.621	8.621	8.621	8.621	8.621
1/a ₀ or (1/a _r)-T _r in °C	K ₀	245	245	245	245	245	245
Thermal Capacity Factor in Joules/cm ³ /°C	TCAP	3.846	3.846	3.846	3.846	3.846	3.846
Material Conductivity (%)	%	24.5	20.4	18.8	15.9	16.3	17.7
Fusing Current Calculation	β	84.73	84.73	84.73	84.73	84.73	84.73
	I	4.79	7.48	13.16	15.15	19.05	23.19
	I _{90%}	4.31	6.74	11.84	13.63	17.14	20.87
	I _{80%}	3.45	5.39	9.48	10.91	13.72	16.70

ERICO® CU-BOND Round Conductor

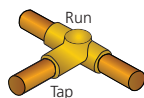
ERICO® CADWELD® conductor codes

Part Number	CBSC8	CBSC10	CBSC13	CBSC14	CBSC16	CBSC18
Conductor Code	T1	T2	T3	T4	T5	T6



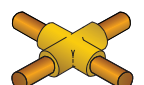
SS Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
SSCT1	115	115PLUSF20	SS	T1	T1	L160 or L160SM
SSCT2	115	115PLUSF20	SS	T2	T2	L160 or L160SM
SSCT3	150	150PLUSF20	SS	T3	T3	L160 or L160SM
SSCT4	200	200PLUSF20	SS	T4	T4	L160 or L160SM
SSCT5	200	200PLUSF20	SS	T5	T5	L160 or L160SM
SSCT6	250	250PLUSF20	SS	T6	T6	L160 or L160SM



TA Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
TACT1	150	150PLUSF20	TA	T1	T1	L160 or L160SM
TACT2T1	150	150PLUSF20	TA	T2	T1	L160 or L160SM
TACT2	150	150PLUSF20	TA	T2	T2	L160 or L160SM
TACT3T2	150	150PLUSF20	TA	T3	T2	L160 or L160SM
TACT3	200	200PLUSF20	TA	T3	T3	L160 or L160SM
TACT4T3	200	200PLUSF20	TA	T4	T3	L160 or L160SM
TACT5T3	250	200PLUSF20	TA	T5	T3	L160 or L160SM
TACT4	200	200PLUSF20	TA	T4	T4	L160 or L160SM
TACT6T4	250	200PLUSF20	TA	T6	T4	L160 or L160SM
TACT5	250	250PLUSF20	TA	T5	T5	L160 or L160SM
TACT6T5	250	250PLUSF20	TA	T6	T5	L160 or L160SM
TACT6	2 X 150	300PLUSF20	TA	T6	T6	L160 or L160SM



XA Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
XACT1	200	200PLUSF20	XA	T1	T1	L160 or L160SM
XACT2T1	200	200PLUSF20	XA	T2	T1	L160 or L160SM
XACT2	200	200PLUSF20	XA	T2	T2	L160 or L160SM
XACT3T1	250	250PLUSF20	XA	T3	T1	L160 or L160SM
XACT3T2	250	250PLUSF20	XA	T3	T2	L160 or L160SM
XACT3	250	250PLUSF20	XA	T3	T3	L160 or L160SM
XACT4T2	250	250PLUSF20	XA	T4	T2	L160 or L160SM
XACT4T3	250	250PLUSF20	XA	T4	T3	L160 or L160SM
XACT4	250	250PLUSF20	XA	T4	T4	L160 or L160SM
XADT5T2	2 x 200	400PLUSF20	XA	T5	T2	L159 or L159SM
XADT5T3	2 x 200	400PLUSF20	XA	T5	T3	L159 or L159SM
XADT5	500	500PLUSF20	XA	T5	T5	L159 or L159SM
XADT6T4	500	500PLUSF20	XA	T6	T4	L159 or L159SM
XADT6T5	500	500PLUSF20	XA	T6	T5	L159 or L159SM
XADT6	500	500PLUSF20	XA	T6	T6	L159 or L159SM

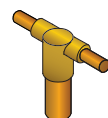


TV Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
TVCT1	150	150PLUSF20	TV	T1	T1	L160
TVCT2	150	150PLUSF20	TV	T2	T2	L160
TVCT3	200	200PLUSF20	TV	T3	T3	L160



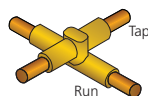
TA ERICO CADWELD connection



GT Type Connections

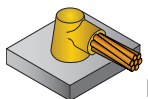
Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
GTC14T1	150	150PLUSF20	GT	14	T1	L160 or L160SM
GTC14T2	150	150PLUSF20	GT	14	T2	L160 or L160SM
GTC14T3	250	250PLUSF20	GT	14	T3	L160 or L160SM
GTC14T4	250	250PLUSF20	GT	14	T4	L160 or L160SM
GTC14T5	2 X 150	300PLUSF20	GT	14	T5	L160 or L160SM
GTC14T6	2 X 150	300PLUSF20	GT	14	T6	L160 or L160SM
GTC16T1	150	150PLUSF20	GT	16	T1	L160 or L160SM
GTC16T2	150	150PLUSF20	GT	16	T2	L160 or L160SM
GTC16T3	250	250PLUSF20	GT	16	T3	L160 or L160SM
GTC16T4	250	250PLUSF20	GT	16	T4	L160 or L160SM
GTC16T5	2 X 150	300PLUSF20	GT	16	T5	L160 or L160SM
GTC16T6	2 X 150	300PLUSF20	GT	16	T6	L160 or L160SM
GTC18T1	150	150PLUSF20	GT	18	T1	L160 or L160SM
GTC18T2	150	150PLUSF20	GT	18	T2	L160 or L160SM
GTC18T3	250	250PLUSF20	GT	18	T3	L160 or L160SM
GTC18T4	250	250PLUSF20	GT	18	T4	L160 or L160SM
GTC18T5	2 X 150	300PLUSF20	GT	18	T5	L160 or L160SM
GTC18T6	2 X 150	300PLUSF20	GT	18	T6	L160 or L160SM

14 = 1/2" (12.8 mm) copper-bonded ground rod, 16 = nominal 5/8" (14.3 mm) copper-bonded ground rod, 18 = nominal 3/4" (17.3 mm) copper-bonded ground rod



XB Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Run	Tap	Handle Clamp
XB3T1T1	2X 150	300PLUSF20	XB	T1	T1	L163
XB3T2T1	2X 150	300PLUSF20	XB	T2	T1	L163
XB3T2T2	2X 150	300PLUSF20	XB	T2	T2	L163
XB4T3T1	2 X 200	400PLUSF20	XB	T3	T1	L164
XB4T3T2	2 X 200	400PLUSF20	XB	T3	T2	L164
XB4T3T3	2 X 200	400PLUSF20	XB	T3	T3	L164
XB4T4T2	500	500PLUSF20	XB	T4	T2	L164
XB4T4T3	500	500PLUSF20	XB	T4	T3	L164
XB4T4T4	500	500PLUSF20	XB	T4	T4	L164
XB4T5T2	500	500PLUSF20	XB	T5	T2	L164
XB4T5T3	500	500PLUSF20	XB	T5	T3	L164
XB4T5T5	500	500PLUSF20	XB	T5	T5	L164
XB4T6T4	3 X 200	600PLUSF20	XB	T6	T4	L164
XB4T6T5	3 X 200	600PLUSF20	XB	T6	T5	L164
XB4T6T6	3 X 200	600PLUSF20	XB	T6	T6	L164



HS Type Connections

Part Number	ERICO® CADWELD® Welding Material	ERICO® CADWELD® PLUS Welding Material	ERICO CADWELD Connection Type	Tap	Handle Clamp
HSCT1	150	150PLUSF20	HS	T1	L160
HSCT2	150	150PLUSF20	HS	T2	L160
HSCT3	150	150PLUSF20	HS	T3	L160

Please contact your ERICO Customer Service Representative for other ERICO CADWELD configurations.





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WARNING

ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at www.erico.com and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

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