

Test and Certificate

Using components and devices which have been tested in compliance with the latest standards is a basic prerequisite for a functional lightning protection system. Installers of lightning protection systems must select components according to the requirements at the installation site and install them in accordance with the manufacturer specifications.

All of lightning protection components used for installing the external lightning protection system shall meet the requirements of IEC 62561 Series as following;

IEC62561-1: Connection Component

IEC62561-2: Conductors and Earth Electrodes

IEC62561-3: Isolating Spark Gaps (ISG)

IEC62561-4: Conductors Fasteners

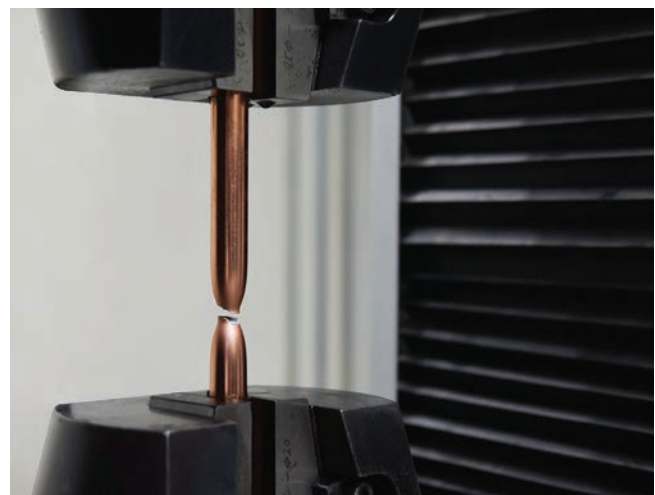
IEC62561-5: Earth Electrode Inspection Housings and Electrode Seals

IEC62561-6: Lightning Strike Counters

IEC62561-7: Earthing Enhancing Compounds

IEC62561-8: Components for Isolated LPS

All of Kumwell components are tested according to IEC 62561 Series and certified by accredited third-party.



Standard Ground Rod

Copper-Bonded Ground Rods meet the requirements of the world rigorous standard-UL. Ground rods are made by molecularly bonding process 99.9% purity electrolytic copper onto high tensile and low carbon steel cores to ensure a perfect and even bonding between the steel and copper. The copper layer whose minimum thickness is 254 micron met to IEC 62561-2 and UL standard.

Standard size diameters being common used are 1/2" , 5/8" , 3/4" , and 1".

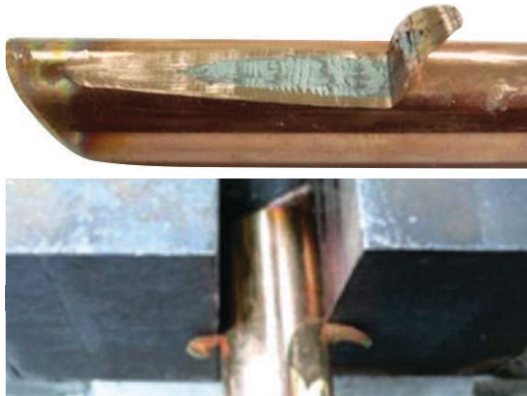
Standard lengths being common used are 4' to 10'.

Thread type ground rods are available for extensible the length of ground rods by coupling.

Intensive Test and Inspection of Ground Rod Ground Rods should pass the following criterions of international standards as shown;

Thickness Inspection

Copper shell of each ground rod shall be passed the thickness inspection to ensure its protective coating. The copper shell shall not be less than 0.254 mm (254 micron) thick at any point met to UL 467 standard.



Adherence of Coating Test

There shall be no separation of the coating from the steel core when subjected to the test described as follow met with UL 467 standard requirements. Peeling of the coating by the steel plates or the jaws of the vise shall be allowed.



Bending Strength Test

There shall be no cracking of the coating when subjected to the test met with UL 467 standard requirements. The application of force shall be such that the rod is permanently bent through a 30° angle.

Straightness Test

Ground rod should be passed straightness test to ensure in its straightness and high tensile with acceptable sag. The deviation of every 305 mm ground rod shall be less than 3.05 mm.

Ground Rod

There are several main objectives providing for well-designed grounding system. First priority is personal safety which followed by protection equipment, signal reference quality, return path for faults and surges, and static dissipation.

In order to follow these objectives, all components shall be meet up to international standards as IEC 62561-2, UL 467. Grounding system must be maintained in a low permanent resistance under adverse conditions for the expected lifetime of Grounding System.

Ground Rods, Conductors, and Connectors in Grounding Network are subjected to severe corrosion to acidic and high concession of salt environment. In case of high mechanical stress is due to the electromagnetic force, and also rapid thermal heating is due to the high current magnitude during fault conditions.

Ground Rod Selection

When choosing which material types to use for a ground rod, the best way is to consider the installation location by measuring soil pH whether if it is acidic, neutral or alkaline.

- If it is acidic (pH < 6), the recommended selection is stainless steel ground rod.
- If it is neutral (pH between 6 - 8), the recommended selection is copper bonded ground rod (254 micron).
- If it is alkaline (pH > 8), the recommended selection is solid copper ground rod. In case of hard soil condition, the recommended selection is copper bonded ground rod 375 or 508 micron.

Copper-Bond Ground

- Earth rods are made from high tensile low carbon steel.
- Each rod is made by molecularly bonding 99.9 % pure electrolytic copper.
- Molecular bond to nickel-sealed high strength steel core
- The copper layer whose minimum thickness 254 micron met to UL standard
- High tensile steel core 450 N/mm² and ensurer a long life span.

Solid Copper

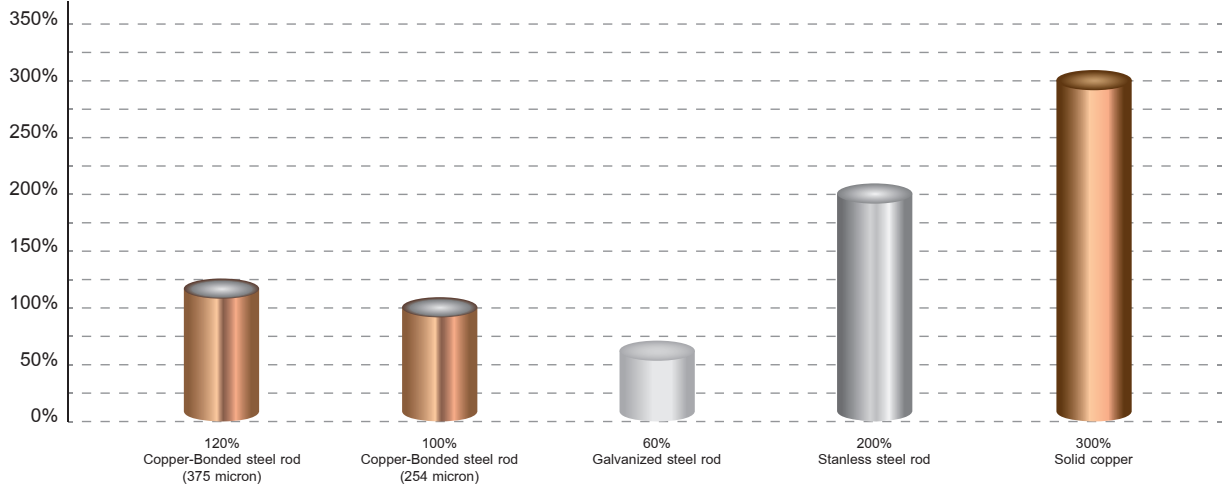
- High investment and high resistance to corrosion
- Low resistivity
- Solid Copper Ground Rod must be prepared a hole which deep down equal with length rod for protect bending (can't be hammering rod).

Stainless steel (316L)

- High investment and high resistance to corrosion
- High Strength

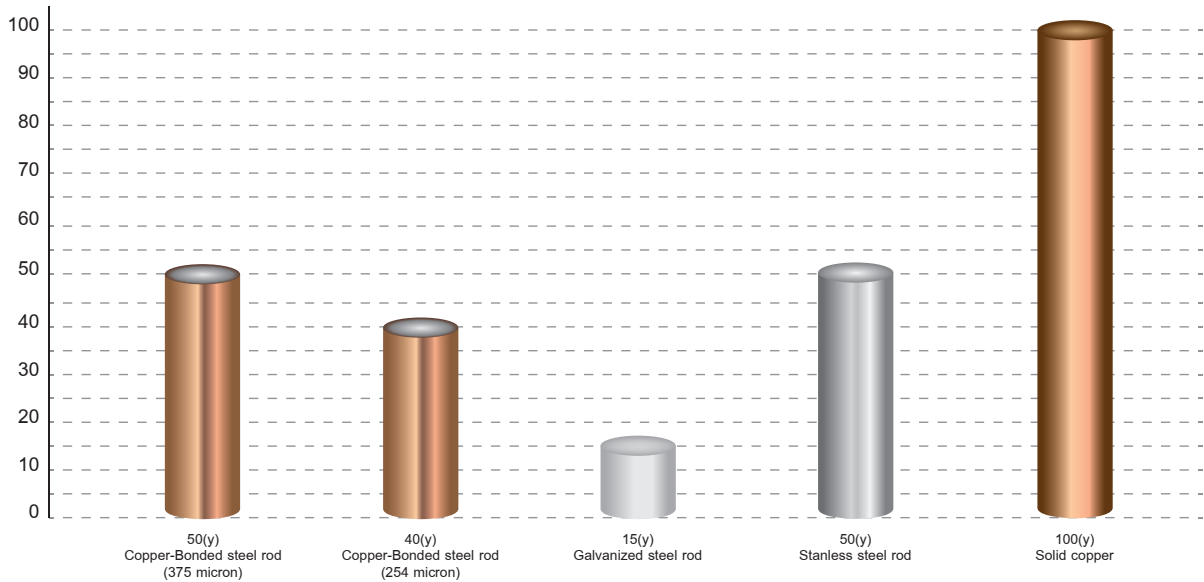
Ground Rod

Comparative cost



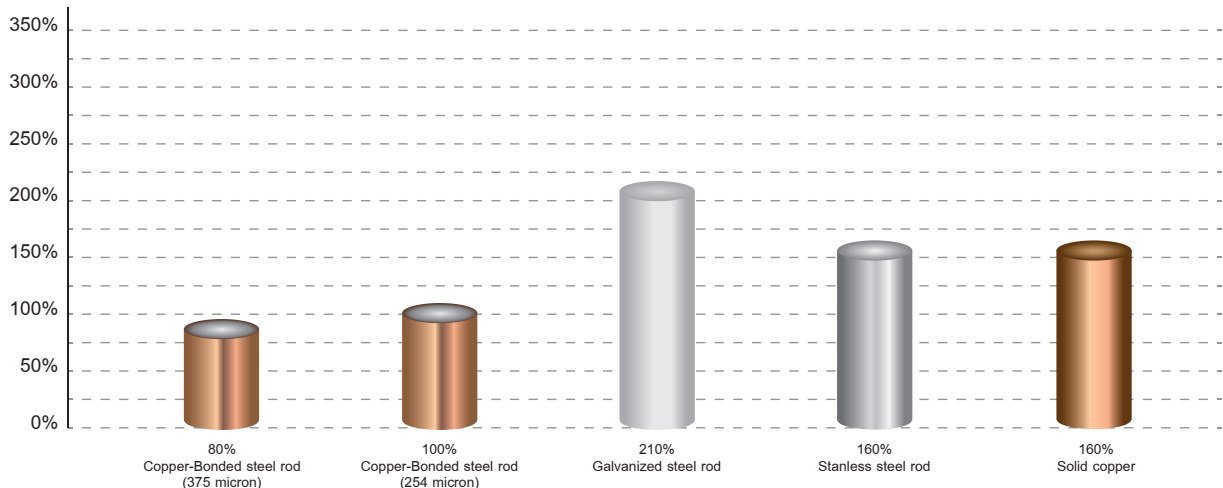
Comparative initial cost (Copper bond steel rod 254 micron as 100% base)

Years



Expected Average Service Life

Comparative cost / Line Index (%)



Comparative Annual cost (Lower is Better)

Ground Rod Selection

There are two main factors for choosing Ground Rod.

- Material
- Size

Material Selection

BS 7430 standard contains the following corrosion protection recommendations:

- Stainless steel has the best resistant to corrosion with normal resistivity but has a relatively high price
- Solid Copper Rod is very resistant to corrosion with very low resistivity but has a very high price.
- Copper Bond Rod (254 micron) is resistant to corrosion with a low resistivity, and is very strong.
Because the core is steel, but cheap

Corrosion resistance and Price

		Soil Copper	Copper Bond	Galvanized Steel	Stainless Steel	
Soil-pH	Acidic (pH < 6)	●●●	●●●●	●●●●●	●●	Corrosion Rate
	Neutral (pH 6 to 8)	●	●	●	●	
	Alkaline (pH > 8)	●●	●●	●●●	●	
Price		Very High	Normal	Low	High	
Age		100 Year	40-60 Year*	15 Year	50 Year	

Note : BS 7430 : 2011, Table 9, Page 59

*Copper Bond 254 micron = 40 year, 375 micron = 50 year, 508 micron = 60 year

The corrosion characteristics of each material compared to the soil (●)

- = indicate corrosion resistance generally unaffected
- = indicate corrosion resistance only slightly reduced
- = indicate corrosion resistance moderately reduced
- = indicate corrosion resistance considerably reduced

Sizing

The selection of material, configuration and cross-sectional area of ground rods shall be in accordance to IEC 62561-2 (Requirements for Conductors and Earth Electroded)

Material, configuration and cross-sectional area of earth electrodes

Material	Configuration	Cross-sectional area ^a			Recommended dimensions
		Earth rod mm ²	Earth conductor mm ²	Earth plate cm ²	
Copper, Tin plated copper ^f	Stranded		≥ 50 ⁱ		1, 7 mm strand diameter
	Solid round		≥ 50		8 mm diameter
	Solid tape		≥ 50		2 mm thick
	Solid round	≥ 176			15 mm diameter
	Pipe	≥ 110			20 mm diameter with 2 mm wall thickness
	Solid plate			≥ 2 500	500 mm x 500 mm and 1, 5 mm thick ^g
	Lattice plate ^g			≥ 3 600	600 mm x 600 mm consisted of 25 mm x 2 mm section for tape or 8 mm diameter for round conductor
Copper-Bonded steel	Solid round	≥ 150 h			14 mm diameter if 250 μm minimum radial copper coating with 99.9% copper content
	Solid round		≥ 50		8 mm diameter if 250 μm minimum radial copper coating of 99.9% copper content
	Solid round ^h		≥ 78		10 mm diameter if 250 μm minimum radial copper coating of 99.9% copper content
	Solid tape ^h		≥ 90		3 mm thick if 250 μm minimum copper coating of 99.9% copper content
Stainless steel ^j	Solid round		≥ 78		10 mm diameter
	Solid round	≥ 176 h			15 mm diameter
	Solid tape		≥ 100		2 mm thick

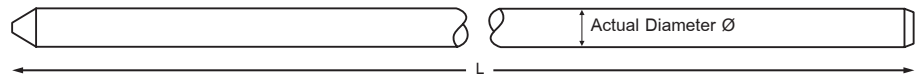
Note: For the application of the earth electrodes, see IEC 62305-3.

- a Manufacturing tolerance : -3%.
- b Threads, where utilized, shall be machined prior to galvanizing.
- c The copper shall be intrinsically bonded to the steel. The coating can be measured using an electronic coating measuring thickness instrument.
- d Lattice plate constructed with a minimum total conductor length of 4, 8 m.
- e Different profiles are permitted with a cross section of 290 mm² and a minimum thickness of 3 mm, e.g. cross profile.
- f Hot dipped or electroplated; minimum thickness coating of 1 μm. There is no requirement to measure the tin plated copper because it is for aesthetic reasons only.
- g In some countries, the cross-sectional area may be reduced to ≥ 1 800 cm² and the thickness to ≥ 0, 8 mm.
- h In some countries, the cross-sectional area may be reduced to 125 mm².
- i The cross-sectional area of stranded conductors is determined by the resistance of the conductor according to IEC 60228.
- j Chromium ≥ 16%, nickel ≥ 5%, molybdenum ≥ 2%, carbon ≤ 0.08%.
- k Shall be embedded in concrete for a minimum depth of 50 mm.
- l Due to higher corrosion rate for solid tape earth conductors, it is recommended to use copper-coated steel with a coating of 250 μm.

Copper-Bonded Ground Rod (254 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.254 mm (254 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type (UL-Listed)

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCBU 128	1/2	12.7	8	2.47
GRCBU 1210	1/2	12.7	10	3.08
GRCBU 588	5/8	14.2	8	3.08
GRCBU 5810	5/8	14.2	10	3.80
GRCBU 348	3/4	17.2	8	4.46
GRCBU 3410	3/4	17.2	10	5.58
GRCBU 18	1	23.1	8	8.04
GRCBU 110	1	23.1	10	10.15

Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCBU 124	1/2	12.7	4	1.23
GRCBU 126	1/2	12.7	6	1.85
GRCBU 584	5/8	14.2	4	1.54
GRCBU 586	5/8	14.2	6	2.31
GRCBU 344	3/4	17.2	4	2.23
GRCBU 346	3/4	17.2	6	3.35
GRCBU 14	1	23.1	4	4.30
GRCBU 16	1	23.1	6	6.09



Test Certificate
IEC 62561 Part 2
UL 467



Material
High tensile strength steel
Copper purity > 99.9%



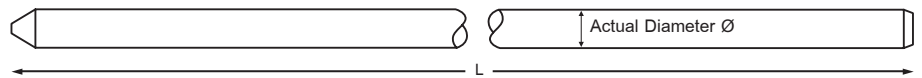
Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (375 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.375 mm (375 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCB375 124	1/2	12.9	4	1.12
GRCB375 126	1/2	12.9	6	1.68
GRCB375 128	1/2	12.9	8	2.59
GRCB375 1210	1/2	12.9	10	3.24
GRCB375 584	5/8	14.3	4	1.60
GRCB375 586	5/8	14.3	6	2.24
GRCB375 588	5/8	14.3	8	3.17
GRCB375 5810	5/8	14.3	10	3.97
GRCB375 344	3/4	17.3	4	2.33
GRCB375 346	3/4	17.3	6	3.49
GRCB375 348	3/4	17.3	8	4.72
GRCB375 3410	3/4	17.3	10	5.80
GRCB375 14	1	23.3	4	4.19
GRCB375 16	1	23.3	6	6.29
GRCB375 18	1	23.3	8	8.35
GRCB375 110	1	23.3	10	10.47



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Material
High tensile strength steel
Copper purity > 99.9%



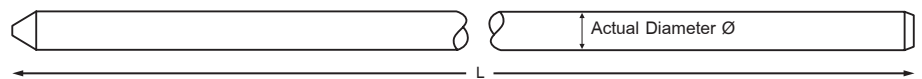
Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (508 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.508 mm (508 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCB508 124	1/2	13.2	4	1.13
GRCB508 126	1/2	13.2	6	1.78
GRCB508 128	1/2	13.2	8	2.71
GRCB508 1210	1/2	13.2	10	3.39
GRCB508 584	5/8	14.6	4	1.65
GRCB508 586	5/8	14.6	6	2.48
GRCB508 588	5/8	14.6	8	3.30
GRCB508 5810	5/8	14.6	10	4.14
GRCB508 344	3/4	17.6	4	2.38
GRCB508 346	3/4	17.6	6	3.57
GRCB508 348	3/4	17.6	8	4.79
GRCB508 3410	3/4	17.6	10	6.00
GRCB508 14	1	23.6	4	4.26
GRCB508 16	1	23.6	6	6.40
GRCB508 18	1	23.6	8	8.57
GRCB508 110	1	23.6	10	10.74



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Material
High tensile strength steel
Copper purity > 99.9%



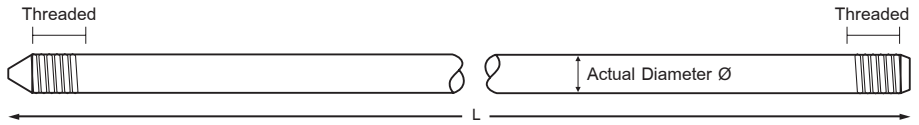
Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (254 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.254 mm (254 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Threaded Type (UL-Listed)

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBUT 128	1/2	12.7	1/2	8	2.47
GRCBUT 1210	1/2	12.7	1/2	10	3.08
GRCBUT 588	5/8	14.2	5/8	8	3.08
GRCBUT 5810	5/8	14.2	5/8	10	3.80
GRCBUT 348	3/4	17.2	3/4	8	4.46
GRCBUT 3410	3/4	17.2	3/4	10	5.58
GRCBUT 18	1	23.1	1	8	8.25
GRCBUT 110	1	23.1	1	10	10.15

Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBUT 124	1/2	12.7	1/2	4	1.23
GRCBUT 126	1/2	12.7	1/2	6	1.85
GRCBUT 584	5/8	14.2	5/8	4	1.54
GRCBUT 586	5/8	14.2	5/8	6	2.31
GRCBUT 344	3/4	17.2	3/4	4	2.23
GRCBUT 346	3/4	17.2	3/4	6	3.35
GRCBUT 14	1	23.1	1	4	4.12
GRCBUT 16	1	23.1	1	6	6.09



Test Certificate
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UL 467



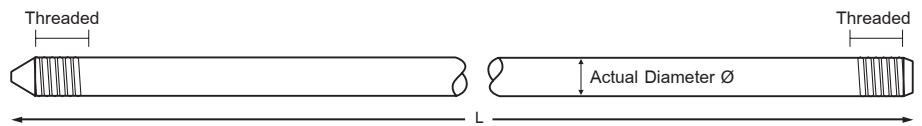
Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (375 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.375 mm (375 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBT375 124	1/2	12.9	1/2	4	1.31
GRCBT375 126	1/2	12.9	1/2	6	1.96
GRCBT375 128	1/2	12.9	1/2	8	2.59
GRCBT375 1210	1/2	12.9	1/2	10	3.24
GRCBT375 584	5/8	14.3	5/8	4	1.60
GRCBT375 586	5/8	14.3	5/8	6	2.40
GRCBT375 588	5/8	14.3	5/8	8	3.17
GRCBT375 5810	5/8	14.3	5/8	10	3.97
GRCBT375 344	3/4	17.3	3/4	4	2.33
GRCBT375 346	3/4	17.3	3/4	6	3.49
GRCBT375 348	3/4	17.3	3/4	8	4.63
GRCBT375 3410	3/4	17.3	3/4	10	5.80
GRCBT375 14	1	23.3	1	4	4.19
GRCBT375 16	1	23.3	1	4	6.29
GRCBT375 18	1	23.3	1	8	8.35
GRCBT375 110	1	23.3	1	10	10.47



Test Certificate
IEC 62561 Part 2



Material
High tensile strength steel
Copper purity > 99.9%



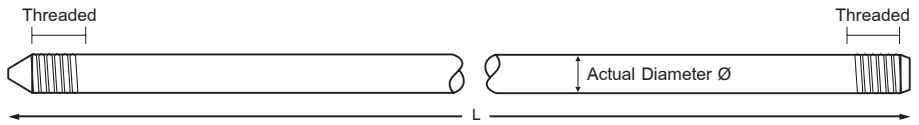
Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (508 micron)



Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.508 mm (508 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBT508 124	1/2	13.2	1/2	4	4.26
GRCBT508 126	1/2	13.2	1/2	4	6.40
GRCBT508 128	1/2	13.2	1/2	8	2.71
GRCBT508 1210	1/2	13.2	1/2	10	3.39
GRCBT508 584	5/8	14.6	5/8	4	1.65
GRCBT508 586	5/8	14.6	5/8	6	2.48
GRCBT508 588	5/8	14.6	5/8	8	3.30
GRCBT508 5810	5/8	14.6	5/8	10	4.14
GRCBT508 344	3/4	17.6	3/4	4	2.38
GRCBT508 346	3/4	17.6	3/4	4	3.57
GRCBT508 348	3/4	17.6	3/4	8	4.79
GRCBT508 3410	3/4	17.6	3/4	10	6.00
GRCBT508 14	1	23.6	1	4	4.26
GRCBT508 16	1	23.6	1	6	6.40
GRCBT508 18	1	23.6	1	8	8.57
GRCBT508 110	1	23.6	1	10	10.74



Test Certificate
IEC 62561 Part 2



Material
High tensile strength steel
Copper purity > 99.9%



Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Coupling



For Threaded Type

Code No.	Rod (Ø) (in)	Length (mm)	Weight (kg)
GRBCO 12	1/2	60	0.07
GRBCO 58	5/8	64	0.09
GRBCO 34	3/4	70	0.14
GRBCO 1	1	90	0.25



Test Certificate
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Material
Silicon bronze



Application
Extend the length of ground rod

For Standard Type

Code No.	Rod (Ø) (in)	Length (mm)	Weight (kg)
GRBCO 12NT	1/2	60	0.10
GRBCO 58NT	5/8	64	0.12
GRBCO 34NT	3/4	70	0.14
GRBCO 1NT	1	90	0.18



Test Certificate
IEC 62561 Part 2



Material
Silicon bronze



Application
Extend the length of ground rod

Driving Head



For Threaded Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRBDH 12	1/2	0.06
GRBDH 58	5/8	0.09
GRBDH 34	3/4	0.16
GRBDH 1	1	0.35



Test Certificate
IEC 62561 Part 2



Material
High tensile strength steel



Application
Protect the top of ground rod while driving.

For Standard Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRDSR 12	1/2	0.13
GRDSR 58	5/8	0.16
GRDSR 34	3/4	0.19
GRDSR 1	1	0.30



Test Certificate
IEC 62561 Part 2



Material
High tensile strength steel



Application
Protect the top of ground rod while driving.

Tip



For Threaded Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRTRR 12	1/2	0.025
GRTRR 58	5/8	0.030
GRTRR 34	3/4	0.070
GRTRR 1	1	0.10



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Material
High tensile strength steel

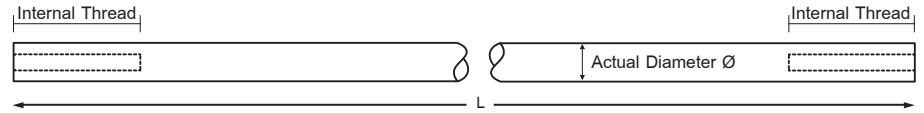


Application
Lead the ground rod into the hard soil area.

Ground Rod Solid Copper Stainless Steel



Solid Copper and Stainless Steel Ground Rod are recommended using in critical soil condition which has a pH value less than 3 or more than 8.



Stainless Steel

Code No.	Diameter (Ø) (mm)	Length (mm)	Weight (kg)
GRSS 1610	16	1000	1.60
GRSS 1615	16	1500	2.40
GRSS 1620	16	2000	3.20
GRSS 1630	16	3000	4.69
GRSS 2010	20	1000	2.50
GRSS 2015	20	1500	3.75
GRSS 2020	20	2000	5.00
GRSS 2030	20	3000	7.44

Test Certificate
IEC 62561 Part 2

Material
Stainless steel 316L

Application
Suitable for critical soil application
which has a poor pH value.

Solid Copper

Code No.	Diameter (Ø) (mm)	Length (mm)	Weight (kg)
GRSC 1510	15	1000	1.58
GRSC 1515	15	1500	2.37
GRSC 1520	15	2000	3.17
GRSC 1530	15	3000	4.73
GRSC 1610	16	1000	1.80
GRSC 1615	16	1500	2.70
GRSC 1620	16	2000	3.60
GRSC 1630	16	3000	5.40
GRSC 2010	20	1000	2.81
GRSC 2015	20	1500	4.22
GRSC 2020	20	2000	5.63
GRSC 2030	20	3000	8.42

Test Certificate
IEC 62561 Part 2

Material
Solid copper - (BS EN 13601)

Application
Suitable for critical soil application
which has a poor pH value.

Caution : When deep driving a solid copper ground rod shall be insert the rod into a bore hole. Do not hammering to the rod directly otherwise the rod might be damaged.

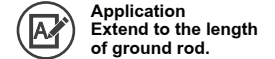
Note : Special Size, Dimeter, Length Copper thickness can be requested.

Coupling



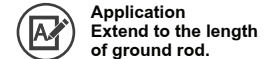
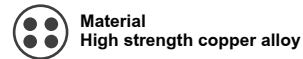
For Stainless Steel and Solid Copper Rod

Code No.	Rod (Ø) (mm)	Weight (kg)
GRSSCO 15	15	0.025
GRSSCO 16	15,16	0.025
GRSSCO 20	20	0.025



For Solid Copper Rod

Code No.	Rod (Ø) (mm)	Weight (kg)
GRSC 15	15	0.03
GRSC 16	15,16	0.03
GRSC 20	20	0.03



Driving Head



For Solid Copper and Stainless Steel Rod

Code No.	For Rod Size Diameter (Ø) (mm)	Weight (kg)
GRSDH 16	15,16	0.047
GRSDH 20	20	0.055

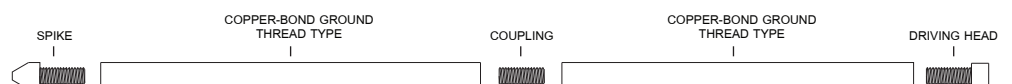
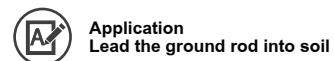


Spike



For Solid Copper and Stainless Steel Rod

Code No.	Diameter (Ø) (mm)	Weight (kg)
GRSP 16	15,16	0.10
GRSP 20	20	0.12



Ground Rod Driving Hammer



Code No.	Description	Weight (kg)
GHDG - SP12	Ground rod Sliding Hammer Set	11.8
GHDG - S12	Sliding Hammer	9.2
GHDG - P12	Extension Driving Probe	2.6
GHDG - SE	Ground rod driving hammer for electric driving hammer	11.8



Application
GHDG - SP12 is for driving ground rod. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter.



Material
Body - Black Steel Pipe
Hammer - Steel S45C
Extension Driving Probe - Steel S45C

GHDG - SE is for driving ground rod. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter and can be use with electric driving hammer or by manually.

One Man Can Do It !

Ground Rod Electric Driving Hammer



GHDE-01

Electric Driving Hammer

Code No.	Rate Power (W)	Voltage (V)	Frequency (Hz)	Speed(No Load) (rpm)	Weight (kg)
GHDE-01	1240	230	50	1400	13.0



Application
The electric driving hammer system is for driving ground rod with GHDG -SE. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter 3.00 m length.



Material
1240 W Electric Jackhammer

Electrolytic Grounding (KEG)

Electrolytic Grounding is made of type K copper pipe with 54 mm (2-1/8") OD diameter which natural chemical electrolytic salt can be refilled inside.

Exothermic welding is used for connecting conductor to the copper pipe.



Code No.	Rod Length (L) (ft)	Conductor Size (mm ²)	Conductor Length (mm)	Rod Type
KEGV-8	8	95	500	Vertical
KEGV-10	10	95	500	Vertical
KEGV-12	12	95	500	Vertical
KEGV-15	15	95	500	Vertical
KEGH-8	8	95	500	Horizontal
KEGH-10	10	95	500	Horizontal
KEGH-12	12	95	500	Horizontal
KEGH-15	15	95	500	Horizontal



Application
Suitable for disperse current into the earth in critical soil area



Material
Type K Copper pipe

