

# Earth electrodes

## Earth rods



### Threaded copperbond earth rod

**Material:** High tensile low carbon steel core with minimum 250 micron copper bond

Part No.	Nominal Diameter (")	Length (mm)	Thread 'B' UNC (")	Shank 'A' (mm)	Weight Each (kg)
RB105	1/2	1200	9/16	12.7	1.18
RB110	1/2	1500	9/16	12.7	1.55
RB115	1/2	1800	9/16	12.7	1.76
RB125*	1/2	2400	9/16	12.7	2.36
RB205-FU	5/8	1200	5/8	14.2	1.53
RB210	5/8	1500	5/8	14.2	1.88
RB215	5/8	1800	5/8	14.2	2.29
RB220-FU	5/8	2100	5/8	14.2	2.51
RB225*	5/8	2400	5/8	14.2	3.00
RB235*	5/8	3000	5/8	14.2	3.79
RB305	3/4	1200	3/4	17.2	2.19
RB310	3/4	1500	3/4	17.2	2.73
RB315	3/4	1800	3/4	17.2	3.27
RB320-FU	3/4	2100	3/4	17.2	3.83
RB325*	3/4	2400	3/4	17.2	4.35
RB335*	3/4	3000	3/4	17.2	5.44

### Fittings

**Material:** Coupling - copper alloy; driving stud and spike - hardened steel

Part No.	Type (")	Weight Each
CG170	1/2 Coupling	0.09
CG270*	5/8 Coupling	0.08
CG370*	3/4 Coupling	0.13
SP100	1/2 Spike	0.02
SP200	1/2 Spike	0.03
SP300	1/2 Spike	0.04
ST100	1/2 Driving stud	0.05
ST200	5/8 Driving stud	0.08
ST300	3/4 Driving stud	0.12

\*UL467 (RB125, RB225, RB235, RB335, CG270, CG370)

### Standards



UL467

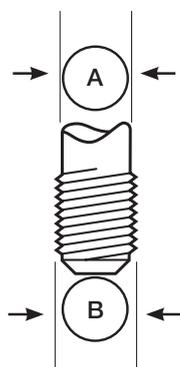
BS EN 50164-2

BS EN 7430

BS EN 50164-1

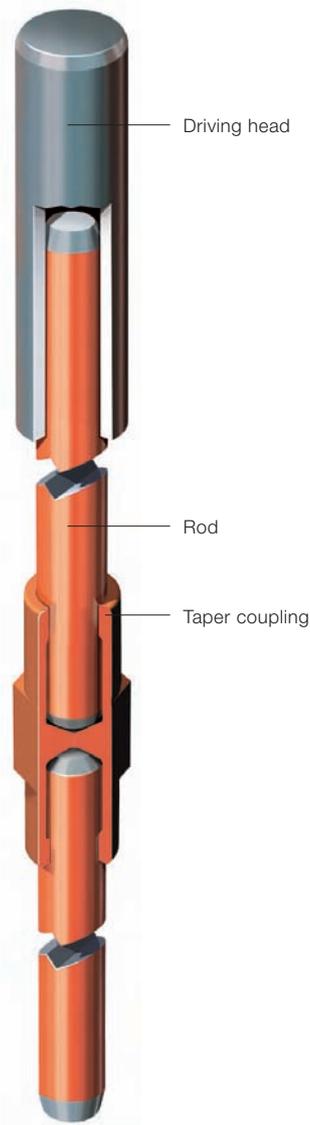
Furse copperbond earth rods probably offer to the installer the best and most economical earth rods available. They are made by molecularly bonding 99.9% pure electrolytic copper on to a low carbon steel core. **Furse rods are not of the sheathed type.** They are highly resistant to corrosion, and because the steel used has a very high tensile strength, they can be driven by power hammers to great depths.

The counter-bored couplings are made from high copper content alloy, **commercial brass is not used.** This again ensures excellent corrosion resistance and high strength.



# Earth electrodes

## Earth rods



### Unthreaded copperbond earth rod

**Material:** High tensile low carbon steel core with minimum 250 micron copper bond

Part No.	Diameter (mm)	Length (mm)	Weight Each (kg)
RB005	9.0 mm	1200 mm	0.62
RB103	12.7 mm	1200 mm	1.18
RB107	12.7 mm	1500 mm	1.55
RB116	12.7 mm	1800 mm	1.76
RB126*	12.7 mm	2400 mm	2.36
RB203	14.2 mm	1200 mm	1.53
RB213	14.2 mm	1500 mm	1.88
RB216	14.2 mm	1800 mm	2.29
RB217	14.2 mm	2000 mm	2.51
RB223	14.2 mm	2100 mm	2.68
RB226*	14.2 mm	2400 mm	3.00
RB236*	14.2 mm	3000 mm	3.79
RB306	17.2 mm	1200 mm	2.19
RB313	17.2 mm	1500 mm	2.73
RB316	17.2 mm	1800 mm	3.27
RB317	17.2 mm	2000 mm	3.64
RB323	17.2 mm	2100 mm	3.83
RB326*	17.2 mm	2400 mm	4.35
RB336*	17.2 mm	3000 mm	5.44

### Fittings

**Material:** Coupling - copper alloy; driving stud and spike - hardened steel

Part No.	Type	Weight Each (kg)
12.7 mm	Coupling	0.09
14.2 mm	Coupling	0.08
17.2 mm	Coupling	0.13
12.7 mm	Driving head	0.25
14.2 mm	Driving head	0.22
17.2 mm	Driving head	0.27

\*UL467 (RB126, RB226, RB236, RB326, RB336)

### Standards



UL467

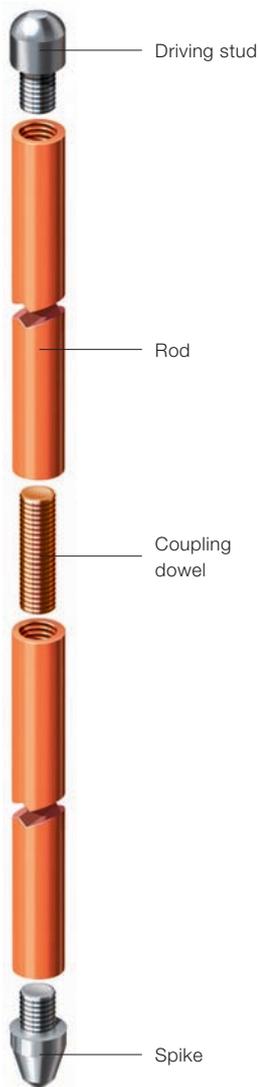
BS EN 50164-2

BS EN 7430

BS EN 50164-1

# Earth electrodes

## Earth rods



### Solid copper and stainless steel earth rod

**Material:** Solid copper or stainless steel

Part No.	Nominal Diameter (mm)	Length (mm)	Weight Each (kg)
<b>Solid copper rod</b>			
RC010	15	1200	1.88
RC011	15	1500	2.35
RC012	15	3000	4.70
RC015	20	1200	3.34
RC016	20	1500	4.18
RC017	20	3000	8.36
RC025	25	1200	TBC
<b>Solid copper rod kit</b>			
RC010-KIT*	15	8 ft (2440 mm)	3.82
RC015-KIT*	20	8 ft (2440 mm)	6.79
<b>Stainless steel rod</b>			
RS005	16	1200	1.87
RS011	16	1500	2.34
RS012	16	3000	4.68
RS016	20	1500	3.65
RS016	20	3000	7.30
<b>Stainless steel rod kit</b>			
16 mm 8 ft (2440 mm) 3.80 kg RS005-KIT*			

### Fittings

**Material:** Coupling dowel - copper; driving stud and spike - hardened steel

Part No.	Type	Weight Each (kg)
ST010	15 mm hardened steel driving stud for copper/stainless steel rod	0.02
ST015	20 mm hardened steel driving stud for copper/stainless steel rod	0.05
CG013	Coupling dowel for 15 mm & 20 mm copper rod	0.02
CG005	Coupling dowel for 16 mm & 20 mm stainless steel rod	0.02
SP010	15 mm hardened steel spike for copper/stainless steel rod	0.02
SP015	20 mm hardened steel spike for copper/stainless steel rod	0.04

### Standards



UL467

BS EN 50164-2

BS EN 7430

### Solid copper rod

Furse solid copper earth rods offer greater resistance to corrosion. They are ideally used in applications where soil conditions are very aggressive, such as soils with high salt content.

### Stainless steel rod

Stainless steel rods are used to overcome many of the problems caused by galvanic corrosion which can take place between dissimilar metals buried in close proximity. Furse stainless steel earth rods are highly resistant to corrosion.

Kits include 2 x 1200 mm rods, coupling dowel, driving stud and spike to make 8 ft rod. Connections to the rods can be by mechanical clamps, compression or by Furse's own "FurseWELD" exothermic welding system.

# Earth electrodes

## Earth rods

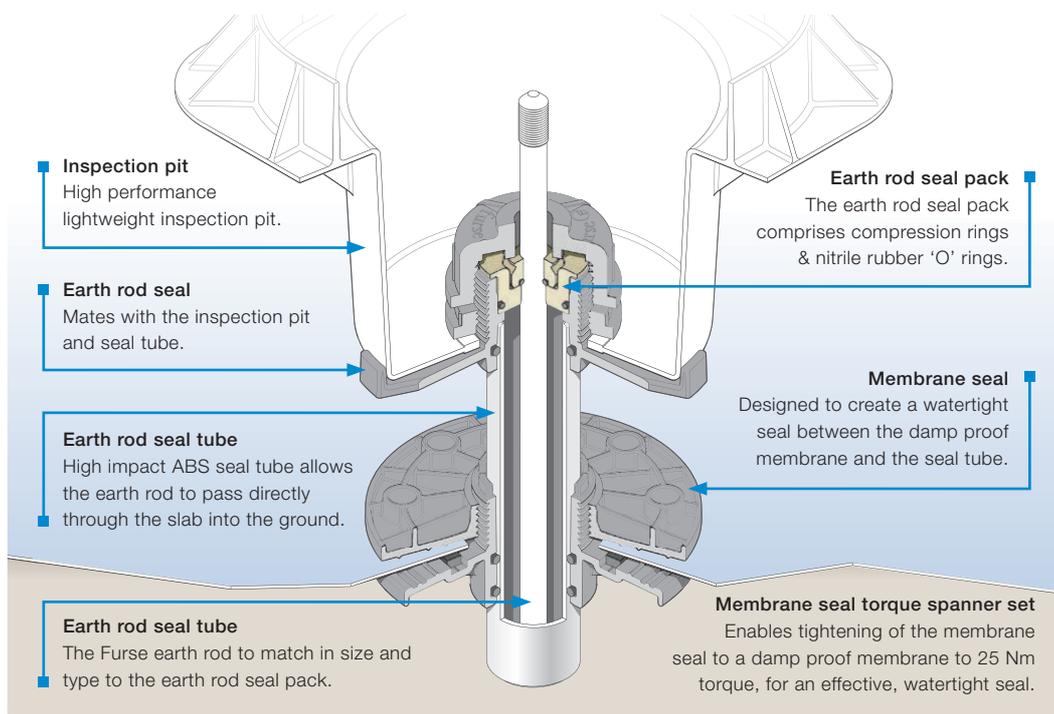


### Earth rod seal

Material: Polyethylene

Part No.	Rod Description	Weight Each (kg)
<b>Earth rod seal assembly</b>		
ES300	Earth rod seal and membrane seal	0.75
<b>Earth rod seal pack</b>		
ES300-12	Seal pack for 1/4" (ø 12.7 mm) Copperbond rod	0.06
ES300-58	Seal pack for 5/8" (ø 14.2 mm) Copperbond rod	0.06
ES300-34	Seal pack for 3/4" (ø 17.2 mm) Copperbond rod	0.06
ES300-15	Seal pack for ø 15 mm solid copper rod	0.06
ES300-16	Seal pack for ø 16 mm solid copper rod	0.06
ES300-20	Seal pack for ø 20 mm solid copper rod	0.06
<b>Earth rod seal tube</b>		
ES310-03	Seal tube, 300 mm length	0.16
ES310-05	Seal tube, 500 mm length	0.27
ES310-10	Seal tube, 1,000 mm length	0.54
ES310-15	Seal tube, 1,500 mm length	0.81
ES310-20	Seal tube, 2,000 mm length	1.08
ES310-30	Seal tube, 3,000 mm length	1.62
<b>Accessory spanner set</b>		
ES320	Membrane seal torque spanner set	0.45
<b>Lightweight inspection</b>		
ES320	Lightweight inspection pit with grey polymer lid	1.80

- When specifying a Furse earth rod seal, ensure that all relevant components are ordered - earth rod assembly, seal pack, accessory spanner set and lightweight inspection pit. The accessory spanner set may be used for multiple earth rod seal installations
  - Please specify the correct size of earth rod seal pack for the earth rod, and the correct length of protective seal tube when ordering
- Note: earth rod seal designed for use with clean, smooth Type 'A' damp proof membranes as defined by BS EN 13967, without the need for adhesive, sealant or mastic. For uneven, textured or tanking damp proof membranes are installed, or where hydrostatic conditions exist, adhesive, sealant or mastic should be applied



# Earth electrodes

## Earth hammer & rig



### Earth rod hammer

Part No.	Description ("")	Weight Each (kg)
HM005	Atlas Copco Cobra TT petrol driven hammer	24
HM010	Earth rod adapter (Suitable for 5/8" earth rods)	3

– For projects where hand driving is uneconomical owing to a large quantity of rods or unfavourable ground conditions, the earth rod hammer can drastically cut installation times

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### Hammer rig

Part No.	Description	Weight Each (kg)
HM105	Hammer rig	196.35

– By mounting a hammer onto a rig, longer lengths of earth rods can be driven. For projects where large quantities of rods are required cost savings can be achieved, for example, by using single 8 ft rods rather than 2 x 4 ft rods which would need couplers etc. Installation time is also considerably reduced. Please specify length of rod to be driven and type of hammer to be used when ordering.

# Earth electrodes

## Inspection pits



### Lightweight inspection pit

**Material:** High performance polymer pit with polymer or concrete lid

Part No.	Description	Weight Each (kg)
PT205	Lightweight inspection pit with grey polymer lid	1.80
PT309-FU	Lightweight inspection pit with black (unbranded) polymer lid	1.80
PT110*	Lightweight inspection pit with concrete lid	7.50
PT004	5 hole earth bar	0.40

#### Accessories for polymer lid

AK005	6 mm Allen key	0.03
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#### Accessories for concrete lid

JH100	M8 x 100 mm lg mild steel 'J' bolt lifting hook	0.04
AS100	M8 x 60 stainless steel Allen caphead screw (2 per lid)	0.03

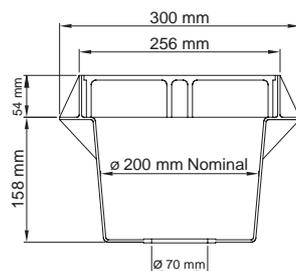
– Manufactured from high-performance, UV stable and chemically resistant polymer with either polymer or concrete lid to suit the application. The lightweight inspection pit with polymer lid is load rated to 5,000 kg and is suitable for general to heavy duty use. It has a lockable lid and improved working area compared to the concrete inspection pit

The lightweight inspection pit with concrete lid is load rated to 1,200 kg and is designed for use in pedestrianised and light vehicular areas. The lid can be locked in place, if required (ord.er 2 x A'S100 Allen caphead screws

\*Not illustrated (drawing available on request)

#### Standards

BS EN 50164-5



### Concrete inspection pit

**Material:** High strength concrete

Part No.	Description	Weight Each (kg)
PT005	Concrete inspection pit	30

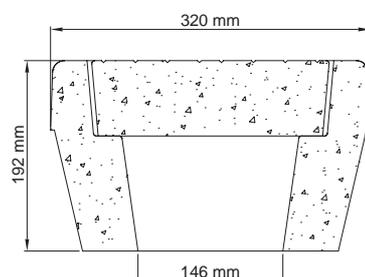
#### Accessories

PT006	5 hole earth bar	0.40
PT007	7 hole earth bar	0.58

– The concrete inspection pit is load rated to 3,500 kg and is suitable for most types of earthing and lightning protection installations. It is not suitable for use in areas where high load, small wheel vehicles are used. The lightweight inspection pit (PT205) is recommended for this type of application

#### Standards

BS EN 50164-5



# Earth electrodes

## Earth plate & lattice



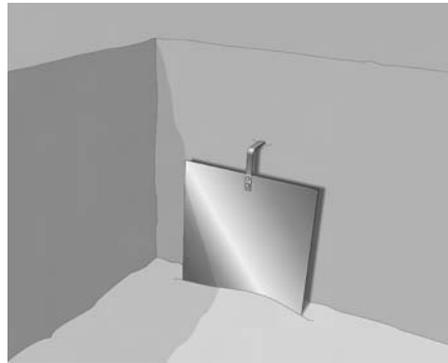
### Earth plate (solid copper)

**Material:** High conductivity copper to BS EN 12163

Part No.	Size	Total Surface Area (m <sup>2</sup> )	Weight Each (kg)
PE005	600 x 600 x 1.5 mm	0.72	5.00
PE015	900 x 900 x 1.5 mm	1.63	11.21
PE010	600 x 600 x 3 mm	0.73	9.74
PE020	900 x 900 x 3 mm	1.63	21.74

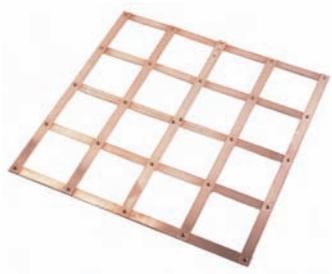
#### Standards

BS EN 12163



– Solid copper earth plates offer a simple alternative style of earth electrode where high resistivity soil or rock conditions prohibit the driving of earth rods

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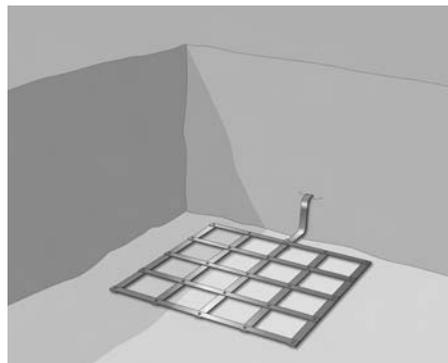
### Earth mat (lattice copper)

**Material:** High conductivity copper to BS EN 13601

Part No.	Size	Total Surface Area (m <sup>2</sup> )	Weight Each (kg)
PE110	600 x 600 x 3 mm	0.31	3.98
PE120	900 x 900 x 3 mm	0.65	7.20

#### Standards

BS EN 13601



– Manufactured from high conductivity copper tape, lattice earth mats are designed to minimize the danger of exposure to high step and touch voltages to operators in situations such as High Voltage switching

# Earth electrodes

## Backfill materials



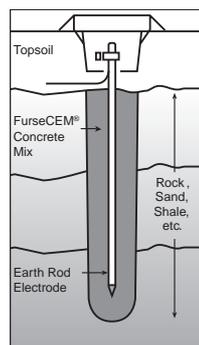
### FurseCEM® conductive aggregate

**Material:** Conductive aggregate

Part No.	Description	Weight Each (kg)
CM025	FurseCEM®	25
CM030	FurseCEM® (supplied with cement)	25

Certain ground conditions make it difficult to obtain a reliable earth resistance, whilst particular installations may require a very low resistance. In such cases, FurseCEM® provides a convenient and permanent solution. By adding FurseCEM® in place of sand and aggregate, to cement, a conductive concrete is formed. This electrically conductive medium has many applications in the electrical/construction industry, including RF and microwave screening, static control and, of course, earthing, for which it was specifically developed.

When used as a backfill for earth electrodes, FurseCEM® impregnated concrete greatly increases the electrode's surface area thus lowering its resistance to earth. CoSHH Datasheet available on request.



For further information on FurseCEM®, please contact the Furse sales office  
A separate datasheet is available

### Standards

BS EN 50164-7



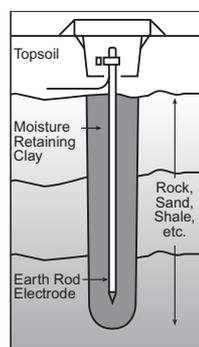
### Bentonite moisture retaining clay

**Material:** Sodium activated montmorillonite

Part No.	Description	Weight Each (kg)
CM015	Bentonite powder	25
CM020	Bentonite granules	25

– Used as an earth-electrode backfill to reduce soil resistivity by retaining moisture. The clay is a sodium activated montmorillonite, which when mixed with water swells to many times its dry volume. It has the ability to hold its moisture content for a considerable period of time and to absorb moisture from the surrounding soil (e.g. from rainfall)

CoSHH Datasheet available on request



# Earth electrodes

## Earth resistance test equipment



### Clamp-on earth resistance tester

Part No.	Description	Weight Each (kg)
DET14C	Clamp-on earth resistance tester	0.75

The DET14C measures earth/ground resistance and current flow by the clamp-on method, with capability for taking ground resistance readings from 0.05  $\Omega$  to 1500  $\Omega$  and for measuring ground leakage current from 0.5 mA to 35 A. With its extra large jaws (39 mm) and its light

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### Digital earth resistance tester

Part No.	Description	Weight Each (kg)
DET3TC	Digital earth resistance tester	1.0

The DET3TC is a three-terminal digital model that includes Attached Rod Technique (ART) capability. The DET3TC is capable of measuring ground resistance from 0.01  $\Omega$  to 2000  $\Omega$  and earth voltages up to 100 V.

With the optional clamp, it will read ground current from 0.5 mA to 19.9 A. This unit is supplied complete with carrying case, test leads and probes.

# Earth electrodes

## Earth resistance test equipment



### Digital earth resistance tester

Part No.	Description	Weight Each (kg)
DET4TD2	Digital earth resistance tester	1.0

The DET4TD2 is capable of 2 pole, 3 pole or 4 pole testing and is designed to measure ground resistance from 0.01  $\Omega$  to 20,000  $\Omega$ . The instrument also includes a voltmeter to measure ground voltages up to 100 V.

This unit is supplied complete with test leads, stakes, batteries and calibration certificate.



### Digital earth resistance tester

Part No.	Description	Weight Each (kg)
DET2/2	Digital earth resistance tester	5.0

The DET2/2 is a four-terminal digital model designed to operate in the most difficult (and electrically noisy) of test environments and for use on large, critical ground systems. This model has an extra digit of resolution (to 0.001) on readings and includes an interference filter, test current control and, most importantly, adjustable test current frequency (105-160 Hz).

As a four-terminal unit, the DET2/2 can also be used to make earth resistivity measurements.