

POWER EARTH GEM MARCONITE CHEMICAL ROD

HIGH PERFORMANCE EARTHING SOLUTION

EARTHING ELECTRODE FOR HIGH PERFORMANCE APPLICATIONS

High Current | Corrosion Resistant | Suitable in Rocky Area,
Sandy Area, Heavy Machines, Transformers, MW Solar



SPECIAL CHEMICAL COMPOSITION

Specially formulated chemical rod for
dry, desert and rocky soil.



REDUCES EARTH RESISTANCE

Capable of reducing earth resistance
by up to **70%**.



WORKS IN LOW MOISTURE

Maintains its resistance and
performance in low moisture soil.



CONDUCTIVE CONCRETE

Has the properties of
conductive concrete.



STANDARD SIZE

5 Ft Rod with 2 Inch
Chemical.



CUSTOM SIZES

Different sizes are available
on order.



DELIVERY NATIONWIDE

Fast and reliable delivery
all over Pakistan.

HIGH
PERFORMANCE
EARTHING
SOLUTION
★ ★ ★



Power Earth GEM Marconite Rod™

GEM 030

UNI2211-W7-C6000

Low-Resistance Chemical Earthing Rod for High-Resistivity Soil Conditions. Inert Chemical manufacture for better working in highly dry soil and heavy equipment earthing

Product of UNICORN ENERGY SYSTEMS



1. The Need for Electrical Earthing

Electrical earthing (grounding) provides a safe, low-resistance path for fault currents, lightning surges, and stray voltages to dissipate safely into the earth. It is a foundational requirement of every electrical installation — protecting human life, safeguarding equipment, and ensuring the stable, reliable



HUMAN SAFETY

Diverts fault current away from people, preventing electric shock from a live chassis or enclosure.



EQUIPMENT PROTECTION

Limits damage to machinery, transformers, and appliances during short-circuit or fault conditions.



LIGHTNING PROTECTION

Gives lightning strike energy a controlled path to dissipate, protecting structures and sensitive equipment.



FIRE HAZARD REDUCTION

Prevents dangerous heat build-up and arcing caused by uncontrolled earth faults.



VOLTAGE STABILITY

Maintains a stable reference potential, reducing voltage fluctuations across a system.



SENSITIVE EQUIPMENT PERFORMANCE

Reduces electrical noise and interference for IT, telecom, and control systems.



CODE COMPLIANCE

A mandatory requirement under electrical safety standards such as NEC, IEC, and IEEE.



SYSTEM RELIABILITY

Ensures protective devices (fuses, breakers, RCDs) operate correctly when a fault occurs.

2. Product Description

Power Earth GEM Marconite Rod™ is a pre-fabricated chemical earthing electrode manufactured by Unicorn Energy Systems using a proprietary graphite/carbon-based (“Marconite”) compound bonded around a copper-clad core rod. The compound is engineered to remain permanently conductive, maintaining a low and stable earth resistance value in high-resistivity ground conditions such as dry, sandy, or rocky soil.

The rod is supplied fully pre-mixed and cured, ready for direct installation in a vertical bore or earth pit, eliminating on-site chemical mixing and reducing installation time.

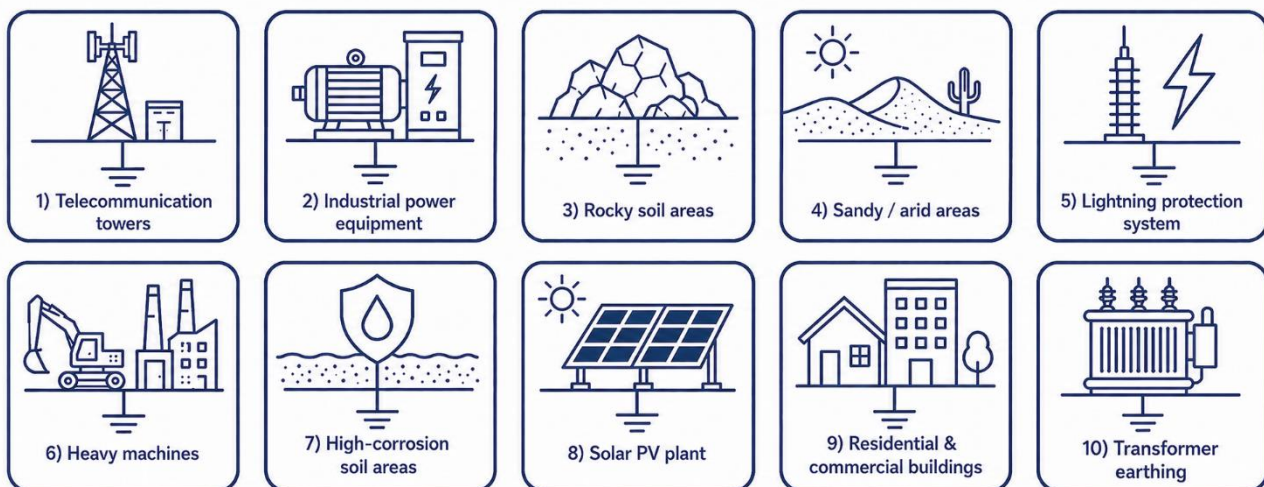
Key Features

- Reduces earth resistance by 60–80% compared to conventional earthing chemicals in sand and rocky terrain
- High-grade carbonaceous compound (98.5%+ fixed carbon) engineered for very low dry resistivity
- Chemically inert, non-corrosive, and electrically stable over the long term
- Manufactured with graphite and hexagonal carbon structures for consistent low-resistance performance in dry environments
- Creates a permanent, moisture-retentive earth envelope around the electrode
- Suitable for industrial, solar PV, telecom, and residential earthing systems



3. Power Earth GEM Marconite Earthing Rod Applications

- Telecommunication towers and base station earthing
- High-current machinery and industrial power equipment earthing
- Rocky area installations with high natural soil resistivity
- Sandy and arid area installations with low moisture retention
- Lightning arrestor / lightning protection system (LPS) earthing
- Heavy machines and large electrical plant earthing
- High-corrosion soil areas requiring a chemically inert, non-corrosive electrode
- Solar photovoltaic (PV) plant earthing
- Residential and commercial building earthing



4. Technical Specifications

Dry Electrical Resistivity	0.04 $\Omega\cdot\text{m}$
Dry Electrical Conductivity	26 S/m
Conductivity Type	Electron flow (non-electrolytic, non-corrosive)
Composition	High-grade carbonaceous material — 98.5%+ fixed carbon, < 1.5% Sulphur
Physical Formation (Particle Size)	200 mesh (80%), 50 mesh (10%), 10 mesh (10%)
Core Conductor	Copper-clad steel earthing rod
Mixing Ratio	3 : 1 (Power Earth GEM Marconite compound: Portland cement) — factory pre-mixed
Shelf Life / Stability	Chemically inert, permanent, and resistant to corrosion

5. Packaging and Physical Dimensions

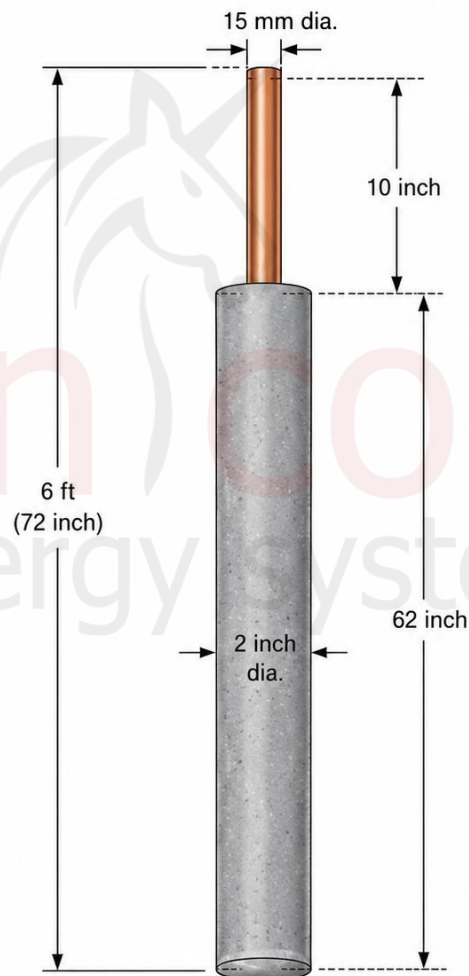
HS Code	8545.90.90
Product Dimensions (L x Dia.)	6 ft x 2 in — other lengths and diameters manufactured to order
Product Dimensions with Packaging	6.7 ft x 2.5 in
Product Weight	7.5 kg $\pm$ 200 g
Product Weight with Packaging	8.2 kg $\pm$ 200 g
Packaging Configuration	PVC pipe sleeve + polythene wrap + bubble wrap
Storage Conditions	Store in a dry area at low humidity and normal ambient temperature; keep away from vibration

6. Shipping & Ordering Information

Product Code	GEM 030
Document Reference	UNI2211-W7-C6000
Packaging Dimensions	6.7 ft length x 3-inch dia
Minimum Order	Please contact Unicorn Energy Systems for project-specific quantities
HS Code	85459090
Product Weight	7.5 kg $\pm$ 200 g
Product Weight with Packaging	8.2 kg $\pm$ 200 g

Power Earth GEM Marconite Rod

Typical Dimensions



Copper clad rod above chemical: 10 inch
Chemical rod length (implied): 62 inch
Total overall length: 6 ft (72 inch)

Scan for Product Videos

Power Earth GEM Marconite Rod
Detail Video of Product



[Click here to see video](#)

Power Earth GEM Marconite Rod
How to Use video



[click here to see video](#)

Electrical Earthing
Process Video



[click here to see video](#)

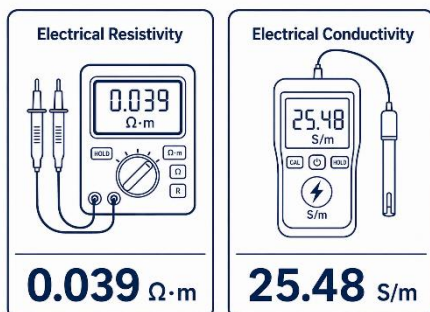


7. Independent Laboratory Verification

Power Earth GEM Marconite Chemical Earth Rod™ has been independently tested at the High Voltage Engineering Laboratory, Department of Electrical Engineering, University of Engineering & Technology (UET), Lahore, to evaluate its electrical resistivity and conductivity characteristics for earthing applications.

Verified Test Results

- Electrical Resistivity: 0.039 $\Omega \cdot m$
- Electrical Conductivity: 25.48 S/m



These independently verified laboratory results demonstrate that **Power Earth GEM Chemical Marconite Rod™** provides a highly conductive, low-resistivity ground enhancement medium suitable for electrical earthing applications. The measured electrical properties support its use in the design and installation of high-performance grounding systems where low earth resistance and long-term conductivity are required.

The measured electrical properties are consistent with the performance requirements expected from high-quality ground enhancement materials used in modern earthing and lightning protection systems designed in accordance with internationally recognized engineering practices.



HIGH VOLTAGE ENGINEERING LABORATORY

DEPARTMENT OF ELECTRICAL ENGINEERING

UNIVERSITY OF ENGINEERING AND TECHNOLOGY

LAHORE-54890, PAKISTAN

Unicorn Energy Systems,
Plot # 3, Khurshid Street, Opposite Rehman City Office,
0.5 km Saggiyan Bypass, Lahore.

No: Univ./EED/0171/23
Dated: 09.10.2023

Subject: Testing of Electrical Earthing Chemical

The following electrical earthing chemical sample was tested on 04.10.2023 in the High Voltage Engineering Laboratory. The testing results are presented below:

TEST REPORT:

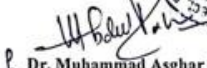
Specimen: Power Earth GEM™
Manufacturer: Unicorn Energy Systems
Filled Volume:
 Dimensions (D×W×L): 49 mm × 49 mm × 300 mm
 Cross-Sectional Area (D×W): $2.4 \times 10^{-3} m^2$
 Length (L): 0.3 m
 Room Temperature: 31 °C

Sr. No	Sample	Electrical Resistivity	Electrical Conductivity
1.	Power Earth GEM™	0.039 $\Omega \cdot m$	25.48 S/m

Note: The results are valid only for the sample tested on 04.10.2023.

Test(s) witnessed by:
 Mr. Muhammad Bilal,
 Assistant Professor, Department of Electrical Engineering.
 UET, Lahore.
 UET, Lahore.


 Chairman
 Department of Electrical Engineering
CHAIRMAN
 Deptt. of Elect. Engg.
 University of Engineering
 & Technology, Lahore


 Dr. Muhammad Asghar Saqib
 Director
 High Voltage Engineering Laboratory

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Office: +92-42-99029423, Web: www.uet.edu.pk Email: hvtagelab@uet.edu.pk

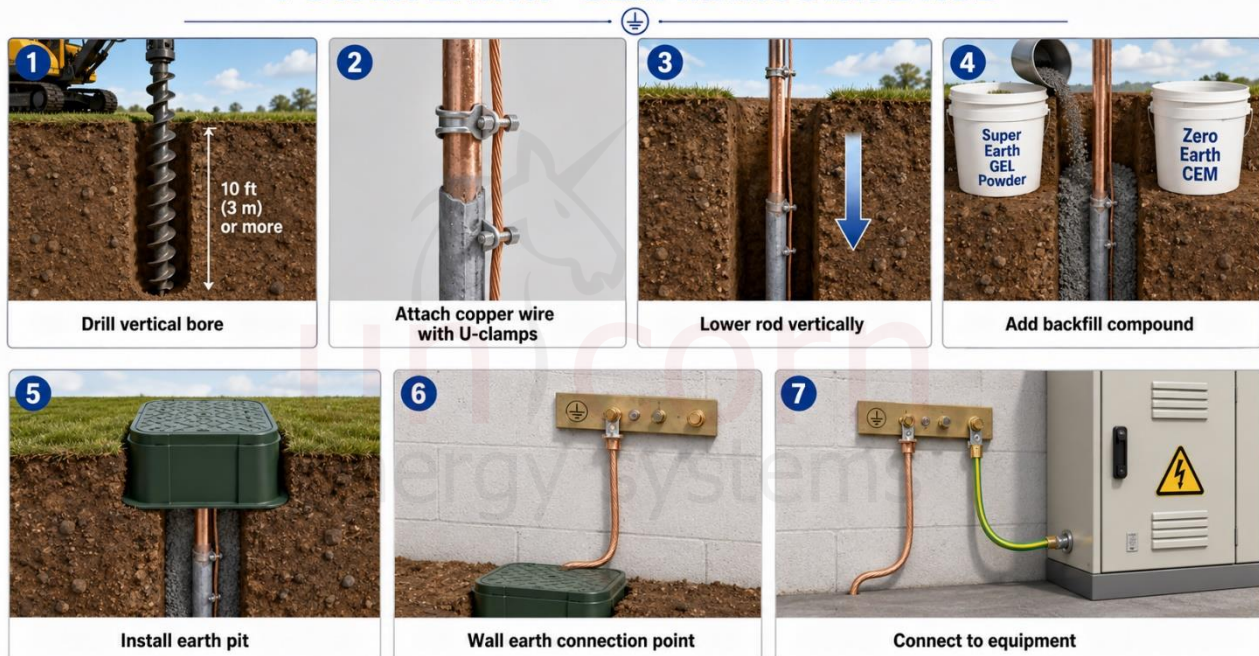
8. Installation Guidelines

- Auger or drill a vertical bore approximately 10 ft (3 m) deep or more as per soil conditions, sized to accept the rod diameter with clearance for backfill.
- Attach earth bare copper wire with **Power Earth GEM Marconite Rod** with U-clamps
- Lower the **Power Earth GEM Marconite Rod** into the bore, keeping it vertical and centered.
- Backfill the annular space around the rod with a compatible earthing backfill compound like **Super Earth Gel Powder** and **Zero Earth CEM** as per suited to local soil conditions.
- Put Earth Pit on top of the earth bore
- Terminate the bare copper wire coming out of earth bore with earth connection point at wall
- Connect earthing conductor from earth connection point to equipment which required earthing

[Scan or click to see YouTube video](#)



POWER EARTH® GEM MARCONITE ROD



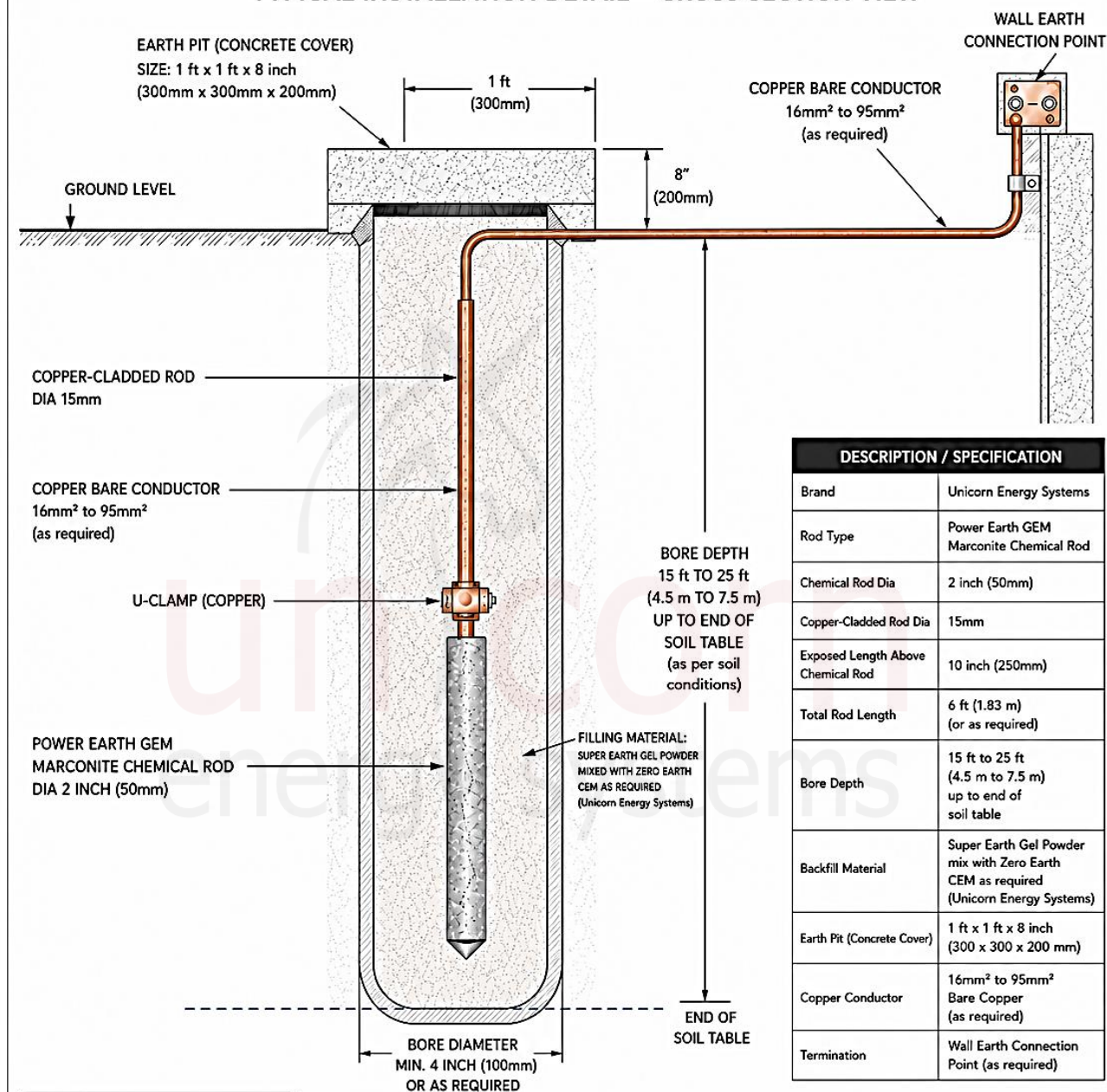
CAUTION:

Handle the pre-fabricated chemical rod with care during transport and installation to avoid cracking or breakage of the cured compound.

NOTE:

Always consult Unicorn Energy Systems technical staff about exact amount of chemicals you required specifically your site

POWER EARTH GEM MARCONITE CHEMICAL ROD TYPICAL INSTALLATION DETAIL – CROSS SECTION VIEW



NOTES:

- All dimensions are minimum unless otherwise specified.
- Backfill material to be compacted in layers for best performance.
- Ensure good electrical continuity between rod, clamps and conductor.
- Installation to be in accordance with IEC 62305, IEEE 80 and local standards.

LEGEND

- Concrete (Earth Pit)
- Backfill Material (Super Earth Gel Powder mixed with Zero Earth CEM)
- Surrounding Soil

POWER EARTH GEM MARCONITE ROD BENEFITS

- ✓ Reduces earth resistance up to 70% in high resistivity soil.
- ✓ 50 year life – Zero maintenance
- ✓ Also works in dry soil environment
- ✓ Chemically stable and non-corrosive
- ✓ Suitable for all soil types

9. Comparison: Marconite Chemical Rod vs. Simple Copper Earth Rod

The table below compares Power Earth GEM Marconite Rod™ against a conventional bare copper (or copper-bonded steel) earth rod with no chemical enhancement, particularly in high-resistivity soil conditions.

Parameter	Power Earth GEM Marconite Rod™	Simple Copper Earth Rod
Electrode Construction	Copper-clad core rod encased in a permanent graphite/carbon conductive compound	Bare solid copper, or copper-bonded steel rod, no enhancing compound
Performance in Dry / Rocky / Sandy Soil	Reduces earth resistance by 60–80% versus conventional methods	Poor — resistance remains high; largely dependent on native soil resistivity
Moisture Dependency	Low — compound retains a conductive, moisture-stable envelope around the rod	High — resistance rises sharply as surrounding soil dries out
Corrosion Resistance	Chemically inert, non-corrosive, and electrically stable long-term	Can corrode over time in saline, acidic, or high-chloride soils
Electrodes Typically Needed	Often a single rod achieves the target resistance	May require multiple rods in parallel or a rod bed to reach the same target
Maintenance	Minimal — stable performance over the life of the installation	Periodic resistance testing; possible added rods as soil dries or electrode corrodes
Typical Design Life	15–20+ years	30–50 years, depending on soil conditions
Best Suited For	High-resistivity soil (rocky, sandy, arid); critical, lightning, and telecom earthing	Normal-resistivity, moist soil where a simple electrode is adequate
Relevant Standards	IEC 62305-3; IEC 62561-7 (earthing enhancing compounds)	IEC 62305-3; NEC (NFPA 70) Article 250 — basic rod electrode requirements

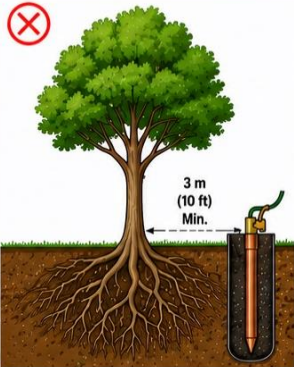
10. Important Installation Precautions

⚠ CAUTION

- **Avoid planting large trees near the earth electrode**, as expanding roots can disturb the surrounding conductive soil and increase earth resistance over time.
- **Do not allow sewage or contaminated water to enter the earth bore**, as it may alter the chemical properties of the ground enhancement material and reduce long-term earthing performance.
- **Avoid constructing underground concrete water tanks, septic tanks, basements, or similar structures close to the earth bore**, since they can restrict natural soil moisture movement and negatively affect electrode performance.
- **Do not subject the earth electrode to continuous high fault current for extended periods**, as prolonged thermal stress can dry the surrounding conductive medium, degrade the bentonite structure, and increase earth resistance.
- **Maintain the earth pit in a location with natural soil moisture whenever possible**, avoiding areas prone to excessive excavation or future civil works.
- **Periodically inspect the earthing system** to ensure the electrode connection remains secure and the measured earth resistance stays within the required design limits.

Note: Proper installation and site selection are essential to achieve the maximum performance and long service life of the Power Earth GEM Marconite Chemical Rod™ earthing system.

1. AVOID PLANTING LARGE TREES NEAR THE EARTH ELECTRODE



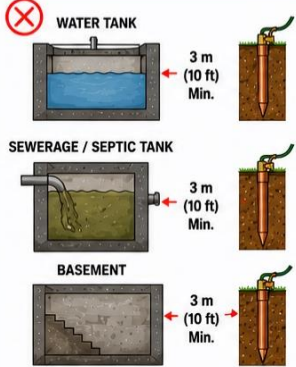
Expanding roots can disturb the surrounding conductive soil and increase earth resistance over time.

2. DO NOT ALLOW SEWAGE OR CONTAMINATED WATER TO ENTER THE EARTH BORE



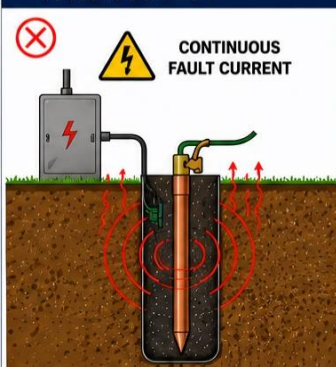
It may alter the chemical properties of the ground enhancement material and reduce long-term earthing performance.

3. AVOID UNDERGROUND CONCRETE STRUCTURES NEAR THE EARTH BORE



These structures can restrict natural soil moisture movement and negatively affect electrode performance.

4. DO NOT SUBJECT THE EARTH ELECTRODE TO CONTINUOUS FAULT CURRENT FOR LONG DURATION



Prolonged thermal stress can dry the surrounding conductive medium, degrade the bentonite structure and increase earth resistance.

11. Reference Standards

Design and application of the earthing system incorporating this electrode should follow the relevant clauses of the following standards:

- IEC 62305-3 — Protection against lightning: physical damage to structures and life hazard (earth-termination system requirements)
- IEC 62561-7 — Lightning protection system components (LPSC) — requirements for earthing enhancing compounds
- NEC (NFPA 70) Article 250 — Grounding and bonding

Note: IEC 62305-3 recommends a single, integrated earth-termination system bonded at one point rather than multiple isolated earth pits, which can otherwise create hazardous potential differences.

Standards & Compliance

Power Earth GEM Marconite Chemical Rod™ is formulated with reference to internationally recognized earthing and lightning protection standards, including **NEC 250** (National Electrical Code — Grounding & Bonding), **IEC 62305** (Protection Against Lightning), and **EN 50164** (Lightning Protection Components).

12. Safety & Handling

- **Handling** — wear gloves and a dust mask when handling the dry powder to avoid dust inhalation and skin contact.
- **Storage** — Keep in original PVC sleeve, polythene wrap, and bubble-wrap packaging until installation; avoid vibration and impact
- **Disposal** — naturally inert and environmentally safe; dispose of empty packaging in accordance with local regulations.
- **Full safety data** — refer to the product Material Safety Data Sheet (MSDS) for complete GHS/OSHA hazard classification and first-aid measures.

13. Shelf Life

Power Earth GEM Marconite Rod™ is manufactured from a chemically inert, permanently conductive carbon-based compound bonded to a copper-clad core. The compound does not dissolve, wash out, or lose conductivity over time, so the product has no functional expiry once installed — performance is governed by correct storage before installation and correct installation practice thereafter.

Shelf Life (unopened packaging)	3 years from date of manufacture, when stored per the conditions below
Storage Environment	Dry, low-humidity area at normal ambient temperature, away from direct sunlight
Storage Handling	Keep in original PVC sleeve, polythene wrap, and bubble-wrap packaging until installation; avoid vibration and impact
In-Service Life	Chemically inert and non-corrosive; designed to remain electrically stable for the operational life of the earthing system once correctly installed

14. Warranty

Unicorn Energy Systems warrants that **Power Earth GEM Marconite Rod™** is free from manufacturing defects and meets the technical specifications stated in this datasheet at the time of dispatch. This warranty covers the material composition and quality of the product only.

Earth resistance achieved at any given site depends on multiple external factors — including native soil composition, moisture content, electrode design, installation method, and site-specific conditions — which are outside the manufacturer's control and cannot be guaranteed by the product alone. Accordingly, this warranty does not extend to

resistance values, performance outcomes, or claims arising after final site inspection and client acceptance of the installed earthing system.

Any claim under this warranty must be raised prior to installation, accompanied by proof of purchase and storage in accordance with this datasheet.

— OUR TRUSTED CLIENTS —

 PAKISTAN RAILWAYS	 PTCL	 FWO	 MUGHAL STEEL	 SUI NORTHERN GAS	 PAKISTAN AIR FORCE	 NHA	 NATIONAL HIGHWAYS & MOTORWAY POLICE	 EMCO
 REKO DIQ MINING COMPANY REKO DIQ MINING COMPANY	 ARY LAGUNA ARY LAGUNA	 BAHRIA TOWN	 Nutribel NUTRIBEL	 Nutrifactor NUTRIFACTOR	 AEPL AEPL	 ROYAL SOLAR ENERGY ROYAL SOLAR ENERGY	 PANTERA ENERGY PANTERA ENERGY	 PAKISTAN ARMY

About Unicorn Energy Systems

Unicorn Energy Systems is a Lahore-based engineering company and Pakistan's first dedicated **manufacturer** of electrical earthing chemicals. Founded on the principle of delivering **internationally-benchmarked** earthing and lightning protection solutions to the local market, the company designs, manufactures, and supplies a complete range of **products** — including ground enhancement materials, conductivity enhancement compounds, ESE and conventional lightning arrestors, earthing electrodes, and solar PV solutions. Beyond manufacturing, Unicorn Energy Systems also provides **specialized engineering services**, including solar installation **inspection and audits**, **thermal imaging** of solar and electrical installations, **lightning arrestor protection radius design**, and **earthing material design consultancy** tailored to specific project requirements.

Every product and service is developed with reference to recognized international standards such as **IEC 62305**, **IEC 62561-7**, and **NEC 250**, and is independently verified through testing at accredited laboratories including the High Voltage Engineering Laboratory at the **University of Engineering & Technology (UET), Lahore**.

Unicorn Energy Systems serves **residential**, **commercial**, and **industrial** clients across Lahore, Islamabad, Rawalpindi, Karachi, Multan, Gujranwala, Raiwind, and Kasur, and has been trusted by leading national organizations including Pakistan Railways, PTCL, the Pakistan Air Force, Frontier Works Organization (FWO), Sui Northern Gas Pipelines Limited (SNGPL), and Mughal Steel. Backed by in-house engineering expertise and a commitment to quality, safety, and reliability, Unicorn Energy Systems continues to advance the standard of electrical earthing and lightning protection practice in Pakistan."

Contact & Support

Website: www.unicornenergysystems.com

Phone: +92 335 4946 498

WhatsApp: +92 335 4946 498

Email: unicornenergysystems@gmail.com

Address: Saggiyan Industrial Area, Lahore, Pakistan



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Disclaimer: Specifications, features, and images in this datasheet are subject to change without prior notice. This document is intended for general product reference; always consult project-specific engineering guidelines and the product MSDS before installation.



ELECTRICAL EARTH SOLUTIONS

RELIABLE • DURABLE • EFFECTIVE



HIGH RELIABILITY

Consistent performance
in all soil conditions



CORROSION RESISTANT

Protects electrodes
and extends system life



EFFECTIVE PROTECTION

Ensures safe and efficient
earthing system



LONG LASTING PERFORMANCE

Stable & maintenance
free for 25+ years



COST EFFECTIVE

Improves earthing
without extra electrodes

IDEAL FOR



BUILDINGS



SOLAR SYSTEMS



INDUSTRIAL PLANTS



TRANSFORMER
STATIONS



TELECOM TOWERS



IT & ELECTRONIC
EQUIPMENT



www.unicornenergysystems.com