

SEE (Saumya earthing electrode) Electrically Conductive Aggregate – An Innovative Earthing Technology

INTRODUCTION

In the past, engineers relied on technology, related to generally available minerals, to design the earthing systems for various applications like power stations, buildings, railways, industrial complexes, water plants, gas and electrical installations etc.

SEE was specifically developed to meet the requirements of all types of earthing applications. It is electrically conductive grey granular material, used as backfill material to enhance the effectiveness of the earth to achieve durable, stable and low resistance performing earthing solutions for all types of soil and difficult ground conditions.

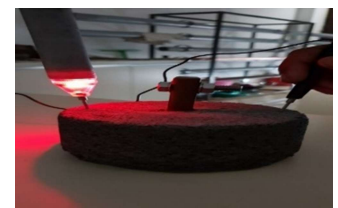
SEE conductive concrete is one of the most suitable materials for treatment of soil. Electrical engineers have been using it to tackle the toughest soil conditions so as to achieve satisfactory earthing solutions throughout the World for over 40 years.

SALIENT FEATURES

Conductive concrete

Specifications:

- a) Fixed Carbon 98.5% minimum Balance 1.5% Ash, Volatile and water
- b) Sulphur content 1.5% maximum
- c) Size grading < 10% maximum below 0.1 mm (100 micron)
< 5% maximum above 3.15 mm
- d) Thermal Stability Between -10°C and +60°C ambient temperature



ROD

Specifications:

- i) **UL certified** For Grounding and Bonding Equipment
- ii) Strength Tested by NEW INDIA EXTRUSIONS PVT. LTD.
- iii) **250 Microns Copper coating** on bright tested by Jewel metellochem laboratories Pvt. Ltd.
- iv) **Bright Bar Rod** standard Quality Insure & Development Authority of India.



Saumya Earthing Electrodes (SEE®)

Making Process

- Conductive Concrete tested then after mixed with bonding agent with fixed ratio check, test and approved.
- Mix material cast in molding system (molding machine)
- Setting time duration up to 3 days
- Cast material querying by sprinkling process.
- Unmold finish material drying process.
- After drying process again testing finish material.
- Packages with ecofriendly recyclable material.

NOTE :

- Making of One **Saumya earthing electrodes** takes time **7 days** . Certified by **Good manufacturing practice (GMP)**
- All Process Maintain under Safety and health management (**ISO 45001 : 2018**)
- We work on quality product. (**ISO 9001 : 2015**)

Specifications:

- a) **Ultra Low Resistivity** : The resistivity of SEE® is **0.001 Ω-m** and even when mixed with Portland cement it is still **0.040 Ω-m**, which is significantly lower than many other earthing materials as detailed below :-

1. SEE Aggregate	= 0.001 Ω-m
2. Normal Aggregate	= 30 to 90 Ω-m
3. SEE® conducting concrete (Mix with Cement)	= 0.040 Ω-m
4. Bentonite	= 3Ω-m upwards
5. Charcoal	= 2.6 X 10 ⁻⁴ Ω-m

- Versatile:** SEE is suitable for all types of soil/ground conditions. It becomes a permanent solid structure and does not shrink or gets washed away. It does not require moisture at all. It performs very well in dry soil and hottest climatic conditions.
- Consistent Performance:** Once installed, SEE based earthing gives consistent performance and earth resistance value remains the same year after year or shows very insignificant variations.
- Contact area:** Solid structure provides larger surface area for dissipation, thus dissipates current faster.
- Chemically Inert:** Its pH value is within the neutral range.
- Non-corrosive:** SEE® does not corrode steel or copper conductor or attacks cement Structures.
- Life:** SEE based earthing systems has a life of more than 40 years.
- No Maintenance:** Absolutely maintenance free and does not need water for life. There is also no need to remove, replace or recharge it in order to maintain the desired earth resistance value.



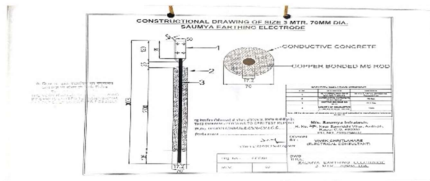
- i. **Environment friendly:** SEE does not leach and pollute ground water channels like other earth enhancing materials. Use of SEE also saves trees from burning to get charcoal. **(RoHS Approved)**
- j. **No environmental hazard:** SEE does not pose any environmental hazard for future generations even after the completion of its life as it disintegrates with soil like any other concrete structure. **(EMS Certified ISO 14001 :2015)**
- k. **Cost effective:** It is cost effective especially in high soil resistivity, sandy or water logged areas.
- l. **Lowest ownership cost:** Long and maintenance free life of SEE based earthing systems makes it's cost lowest among all other earthing systems.
- m. **Easy to Install:** Requires only a bore hole or trench to install.
- n. **Compressive Strength:** SEE (**Saumya Earthing Electrodes**) conductive concrete once it is set displays a greater compressive strength than Grade 15 concrete and becomes significantly greater over a period of time.

TESTS

Besides regular batch wise testing by manufacturer, SEE® (Saumya earth electrodes) and material were also tested for various tests by independent laboratories.

A. **LVD , Test :** Low Voltage Directive (LVD) ensures that electrical equipment within certain voltage limits includes protection against electric shock and other hazards. **(CE approved)**

B. **CPRI, Bangalore (SAUMYA EARTHING ELECTRODES) :** SEE 3mtr 70 mm dia tested in lab



3.2 CPRI,Bangalore(CBR ROD) : CBR Rod 17.2 mm Dia tested



TECHNICAL ASPECTS OF DESIGNING EARTHING SYSTEM

A) General Requirement: Proper grounding is a necessity for designing any electrical power system.

A good grounding system provides a low-impedance path for electrical system's fault and lightning induced currents to enter the mother earth and provide safety. Effectiveness of a buried grounding system depends on many factors like:-

- ii Soil characteristics such as moisture content, soil temperature and type; which determines the resistivity of the earth.
- iii Resistance of the earth (or earth resistivity); which significantly impacts overall impedance of the buried conductor.

PRACTICAL ASPECTS OF USING SEE®

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Single Electrode : SEE® mix is poured around the metal conductor in the augured / borehole and left to set into a permanent solid structure.

For Earth Enhance using natural soil like yellow cotton / back for better maintain lower resistivity and solid compaction with Saumya Earthing Electrodes .



Earth Grid: Horizontal conductor of the grid is embedded in SEE® for larger surface area. It also saves over sizing of steel rods, which is used to counter the effect of corrosion in bare rod designs. Cross and parallel joints of earth grid conductor are embedded in SEE® conductive concrete to prevent the opening of welded joints due to corrosion. This keeps connectivity of the grid intact.



Locking System: Connection point locking with same earthing material for increase earthing life .



Testing :- After Installation Test service provide by Reerth technologies pvt. Ltd.

- Test carried through digital megger DET Series .





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CUSTOMER REFERENCES

