

**INTER - TECH**

**Welcome**

**You**

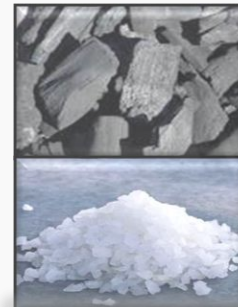
## History - Types of Earthing Systems in practice :

- Driven Rods
- Pipe Earthing
- Plate Earthing
- Chemical Earthing
- Gel or Pipe in pipe technology
- Solid section wire mesh/mat



## Earth Enhancing / back fill materials in use :

- Charcoal and Salt ,
- Sodium Carbonate ,
- Calcium Carbonate,
- Calcium Sulphate,
- Copper Sulphate ,
- Bentonite.



**Charcoal &  
Salt**



**Calcium  
Carbonate**



**Copper  
Sulphate**



**Sodium  
Carbonate**



**Calcium  
Sulphate**



**Sodium  
Bantonite**

## Maintenance of above said earthing systems :

### These earth enhancing materials require:-

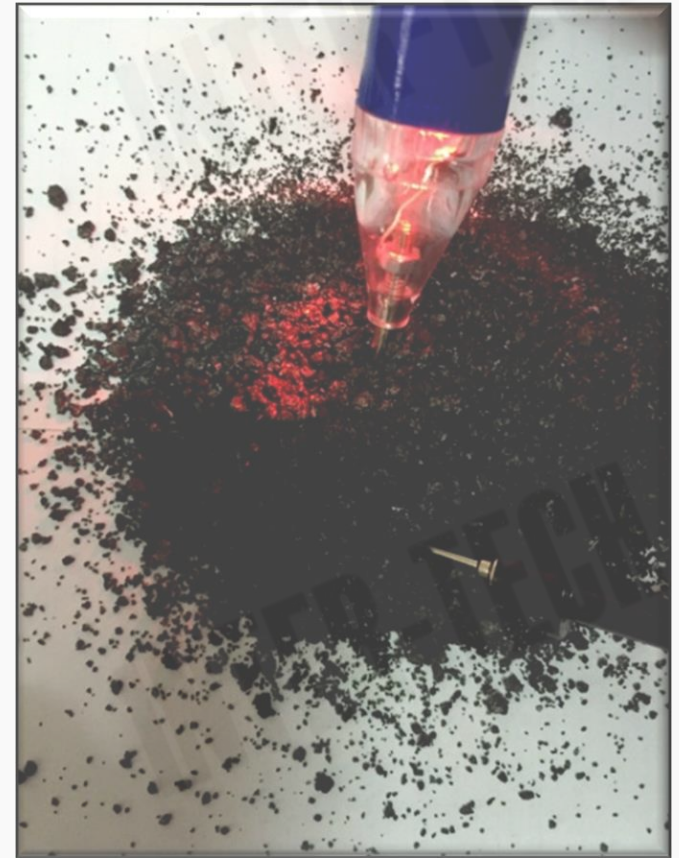
- Regular watering,
- Re-charging or complete replacement over a period of time,
- Even Bentonite needs regular watering to maintain its beneficial characteristics - as per IEEE 80 Std.



**So, what are the  
New Earthing Technologies  
Available around the World**

One such technology is :-

# Marconite - Electrically Conductive Aggregate



## Uses of Marconite ?

Marconite was developed specifically for :-

- a) Electrical Earthing/Grounding
- b) Anti Static Applications
- c) Electro Magnetic Shielding



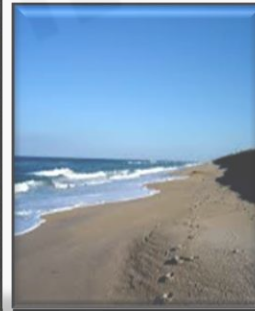
## Qualities of Marconite :

Versatile & suitable for all types of soils:-

- Hilly terrain, Rocks or Granite,
- Sand or sandy soils,
- Salty terrains or sea shores,
- Water logged areas or River beds,
- Made up grounds.



Hilly terrains



Sea Shores



Sandy Soils



Water logged



## Qualities of Marconite :

- Ultra low resistivity : 0.001  $\Omega$  m
- When mixed with cement : It is still 0.04  $\Omega$  m
- Higher mechanical strength : > M25 Gr concrete
- Chemically inert : ph is in neutral range
- Does not corrode metal conductor
- Conduction of current : Electronic

## Benefits of using Marconite :

- Permanent, no water, maintenance or recharge required for it's life,
- Consistent performance
- Unaffected by change in environment,
- Does not dissolve, leach or be swept away by ground water channels.

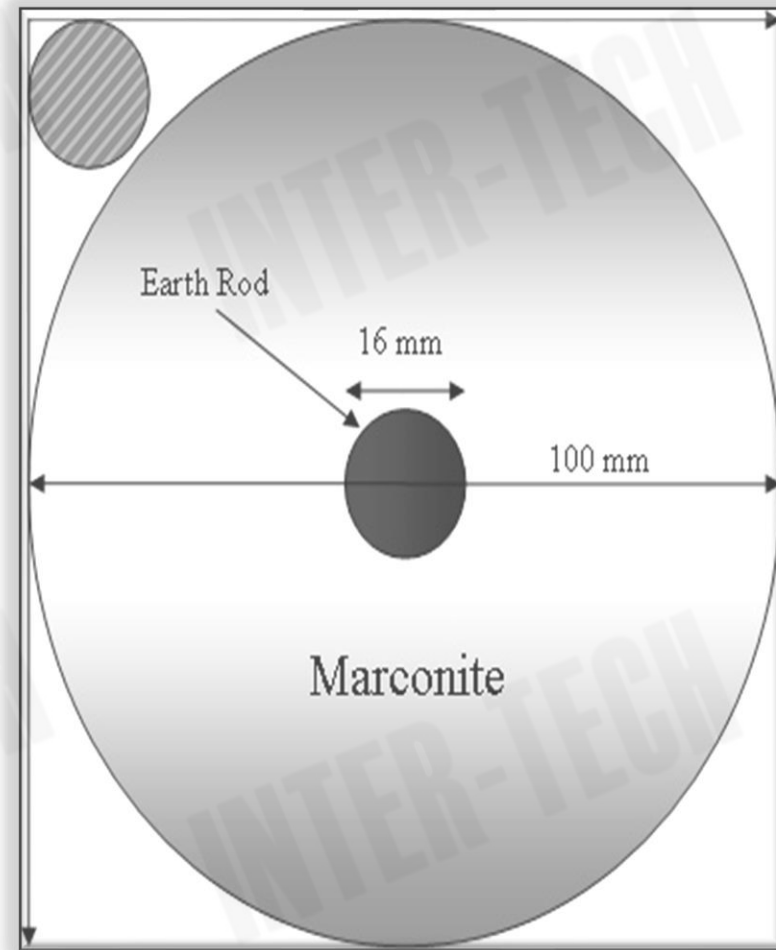
## Benefits of using Marconite :

- Environment friendly,
- Biodegradable, no environmental hazard even after it's complete life,
- Life is more than 50 years,
- Lowest ownership cost,
- Solid structure provides larger surface contact area.....

## Contact surface area:

Contact surface area of marconite encased earth electrode increases more effectively than the area of ground rod.

A 16mm Dia ground rod, encased in 100mm Dia shell of Marconite concrete has contact surface area of nearly 6.4 times than the area of bare rod.



## How does Marconite work :

- True conductor & does not need ions or presence of water to conduct electricity i.e. Electronic conduction.
- Does not suffer from effects of drying and performs in dry soils.

## Tests at CPRI, Bangalore :

### ➤ Fault Current

40 mm & 100 mm Dia X 3 m – 80.52 kA

16 mm & 80 mm Dia X 3 m – 39.66 kA

### ➤ Earth Resistance [In a rocky soil having resistivity 468.29 ohms-m ]

100 mm Dia X 3 m – 90.87 ohms

200 mm Dia X 3 m – 55.43 ohms

# Comparison between Marconite & Other backfill materials

	Marconite	Other backfill Materials
Resistivity	0.001 $\Omega$ -m.	2.5 $\Omega$ -m or above.
ph Range, Conduction	ph is Inert & in neutral range. Electronic Conduction.	Alkaline and Ionic conduction.
Watering, Environment	No watering and No ground water pollution	Need regular watering, chemical pollute ground water channel
Uses, Life	Versatile, Life 50 yrs + and does not need any recharge	Limitation in rocky soil, 8/10 yrs and needs regular recharge.
Corrosion	Embedded metal conductor does not corrode.	Metal conductor gets corroded because of moisture and heat.
Surface contact area	Larger surface contact area	Limited to metal conductor Dia.
Owner ship cost	Lowest considering long life	High considering short life.



Lowest Ownership Cost	Marconite <i>D</i> 100 mm <i>L</i> 3 m	Pipe <i>D</i> 40 mm <i>L</i> 3 m	Plate 0.6 m X 0.6 m
Surface area:1 unit	0.96 sq m	0.38 sq m	0.72 sq m
Electrodes required for life equivalent to one Marconite unit	1 no.	16 nos.	7 nos.
Cost	<b>Rs 16, 500/-</b>	Rs 2,618/- * 16 = <b>Rs 41,888</b>	Rs 4,500/- *7 = <b>Rs 31,500</b>
Maintenance cost for life.	<b>Nil</b>	Rs 5,705 * 16 = <b>Rs 91,280</b>	Rs 7,335 *7 = <b>Rs 51,345</b>
<b>Ownership Cost</b>	<b>Rs 16,500</b>	<b>Rs 1,33,168</b>	<b>Rs 82,845</b>

# Achievements & Testimonials

**We have installed  
Pan India 15000 +  
Marconite Earth Pits  
Where 'No' maintenance or  
Water is required for the  
Next 50 years**

# Our Valued Customers in India :



IndianOil



BHUSHAN



नई दिल्ली नगरपालिका परिषद



Smart solutions.  
Strong relationships.



नेशनल फर्टिलाइजर्स लिमिटेड  
एन.एफ.एल.  
NATIONAL FERTILIZERS LIMITED



കേരളത്തിന്റെ ഊർജ്ജം



HONDA



HAVELLS



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No.D-731/EE(M/N)

Dated: 12/04/2016

To whom so ever it may concern

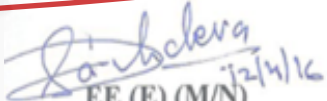
This is to certify that the work for "Installation of Earthing at sub-station Rohit House" was awarded to M/s Inter Tech, B.83, Flatted Factory Complex. Okhla Industrial Estate, Phase-III, New Delhi-110020. vide work order No.61/EE(MIN)/2013-14 dt.14.03.2014. The above mentioned work was carried out at 11 kV ESS at Rohit House, Tolstoy Marg, New Delhi -110001, by M/s Inter Tech, as per the following details:

- Earth enhancing conductive concrete - Marconite
- Conductor - 16 mm Dia MS rod
- Casting size - Dia 80 mm x length 6000 mm

Subsequently, it's earth resistance were jointly measured thrice during the last two years by using digital earth tester of MEGGER make and applying fall of potential method.

Earth measurement results :				
Electrode pit no	Uses	First 27/03/2014	Second 07/04/2014	Third 09/04/2016
1	Transformer Neutral	0.76 Ω	0.71 Ω	0.29 Ω
2	Transformer Neutral	0.72 Ω	0.68 Ω	0.28 Ω
3	Electrical Panel Board	0.88 Ω	0.85 Ω	0.33 Ω
4	Transformer Body	0.77 Ω	0.72 Ω	0.43 Ω
5	Transformer Body	0.68 Ω	0.67 Ω	0.35 Ω
6	Electrical Panel Board	0.99 Ω	0.96 Ω	0.44 Ω

During last two years no inconsistency in performance of these earth electrodes was noticed and no maintenance or watering, of these pits, was done.

  
EE (E) (M/N)  
12/4/16

# Challenge - Case 1 Zesco power project at Zambia



# Challenge – Case 2 Re-locatable Electrodes for Communication lorries



# Designs prepared as per the client's site requirement





# Effect of Corrosion on Plate / Chemical / Pipe-in-Pipe Earthing



# Marconite embedding saves Metal conductor from Corrosion



## Reason to choose Marconite :

- Low resistivity
- Versatile
- Cost effective
- Chemically inert
- High strength
- Easy to use
- Permanent & Secure
- Environment friendly



**Where other products fail  
Earthing specialists rely upon**

**Marconite**

**Thank you**