

BENTONITE



PERFECT FOR ELECTRICAL EARTHING & LIGHTNING PROTECTION



What is AIMMS Bentonite?

BENTONITE is a Moisture Retaining Clay of very Low Soil Resistivity. When mixed with water, it is very effectively used as an Earth-Electrode BACKFILL. BENTONITE's low soil resistivity, ability to hold its moisture content for a considerable period of time coupled with its ability to absorb moisture from the surrounding soil enables it to lower the resistance-to-ground values of an Earthing System quite considerably. This is why it is considered to be a PERFECT solution for Electrical Earthing.

Why use AIMMS Bentonite ?

- ◆ **Salt & Charcoal are highly corrosive and start reacting with the copper electrode as soon as they come in contact with it.**
- ◆ Salt is soluble in earth. So, when it rains it dissolves away the salt and there is nothing left to assist the electrode in getting rid of the fault current. In effect, after a little while, you are left with **neither the expensive copper nor the salt & charcoal.**
- ◆ **Bentonite** on the other hand is a mineral. It is **NOT a chemical.** It is chemically inert, stable and does not react with Copper earthing electrodes or mats. Due to its sticky nature when wet, **Bentonite actually protects copper** and forms a good bond between the electrode and the earth.
- ◆ **Independently tested by Exova Labs (UAE)** to verify the electrical properties.
- ◆ Certified "**GREEN**" Product (**Environmentally Friendly Product**).
- ◆ **Economical & Permanent Solution** as compared to the traditional Salt & Charcoal Mixture.
- ◆ **Essential for Infrastructure projects** like telecommunication and electricity supply towers etc. **Commercial and Domestic** applications like **high rise towers and housing projects.**
- ◆ **Get an Internationally Compliant Earthing System.**

Method of Preparation & Application

Preparation of Slurry is the most important aspect for getting the best result out of **BENTONITE**. The slurry is prepared in the following Proportion (**BENTONITE**: Water Ratio). For areas that receive good annual rainfall, the mixing ratio is 1:1, i.e. for each bag of **BENTONITE** (25 Kg), mix 25 Liters of water. For dry areas that does not receive good annual rainfall, the water part in the slurry is increased to 1.4 - 1.5 times i.e. for each bag of **BENTONITE** (25 Kg), mix around 35-38 Liters of water depending upon the severity of dryness. The above ratio shall be maintained for the entire requirement of the treatment volume.

Mixing **BENTONITE** with water properly to make homogenous & swelling thick slurry is **EXTREMELY** important in achieving the required results from the product. To make the slurry, a standard motorized cement mixer can be used or alternatively it can be mixed in a drum or wheel barrow itself. In case of hand mixing, a hand shovel or thick wooden rod should be used to stir the mixture properly to make a homogenous and swelling type of thick muddy mixture (slurry). To obtain a good contact between the Soil and the Electrode the slurry must be poured immediately after the preparation, allowing it to swell around the Electrode Conductor.

BENTONITE

In case of deep bore hole grounding, some margins should be kept in the above water mixing ratios to avoid excess water quantity in thick slurry, as remixing of water is additionally required during the pouring of slurry into the borehole i.e. pouring the water with pressure into the borehole simultaneously with the thick slurry is necessary to avoid **BENTONITE** chocking inside the deep boreholes. This is to avoid air gaps along the length of vertical earthing electrodes and to fill the deep boreholes completely from top to bottom with **BENTONITE**. Care should be taken not to use too much of water as to fill the whole borehole with water itself. Before pouring **BENTONITE** slurry into boreholes in dry-rocky areas, where the boreholes do not collapse easily, the filling of dry boreholes completely with standing water for a day or two until the water is absorbed completely into it, helps in getting very good results.

No. of Bags Required for a Given Borehole

The number of BENTONITE bags (25 kg each) required for an installation can be calculated by the given equation. Where both D and L are in meters (m).
Note that L is the total length of the vertical rod, not the depth of the bore hole.

$$\text{No of Bags of Bentonite} = 27 \times D^2 \times L$$

As can be seen from the chart, **BENTONITE** is very economical to use.

TABLE-A							
Number of BENTONITE bags required for a given borehole							
Diameter of the bore hole (D)	Length of the vertical rod (m)						
	1.5	3.0	4.5	6.0	7.5	9.0	
0.10m (10 cm)	0.4	0.8	1.2	1.6	2.0	2.4	
0.12m (12 cm)	0.6	1.2	1.7	2.3	2.9	3.5	
0.14m (14 cm)	0.8	1.6	2.4	3.2	4.0	4.8	
0.16m (16 cm)	1.0	2.1	3.1	4.1	5.2	6.2	
0.18m (18 cm)	1.3	2.6	3.9	5.2	6.6	7.9	
0.20m (20 cm)	1.6	3.2	4.9	6.5	8.1	9.7	
0.22m (22 cm)	2.0	3.9	5.9	7.8	9.8	11.8	
0.24m (24 cm)	2.3	4.7	7.0	9.3	11.7	14.0	

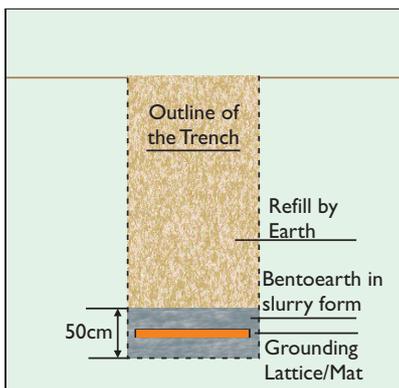
No. of Bags Required for Earthing Lattice / Mats / Plates

We recommend that a 0.25m (25cm) layer of Bentonite be used under the earthing mat and 0.25m (25cm) be used above the earthing mat. This quantity can be reduced under certain circumstances. Please contact us for additional details if you are installing a Lattice or a Mat. We can also suggest Pit size depending upon your lattice / mat size. The easiest way to install Bentonite for an earthing mat is to put a 0.25m layer of DRY Bentonite in the pit and spray water on top of it. Then lay the earthing mat with all connections made and ready. Put another layer of DRY Bentonite of 0.25m on top of it. Then spray water on the top layer. Fill up the rest of the pit with the native clay.

$$\text{No. of bags} = 32.8 \times \text{Area of the Pit (m}^2\text{)} \times \text{Total Thickness of Bentonite Layers (m)}$$

So, for a 1.5m x 1.5m Pit with 0.25m (25cm) layers of Bentonite above and below the mat, the calculation would look something like

$$\text{No. of bags} = 32.8 \times (1.5 \times 1.5) \times (0.25 + 0.25) = 36.9 \sim 37$$



Colour	Tan to Gray (Varies)
Bulk Density - Dry	0.820 g / cm ³
Particle Size (Dry) 150µm sieve (100 mesh)	98% Passing
Resistivity	1.0 to 7.0 (Ω / m)
pH Slurry (8%)	7.0 to 8.0
Conductivity	0.1 to 0.4 (S / m)
Average Moisture Content	≤ 13%
Liquid Limit	≥ 100%
Other Characteristics	Non Toxic & Non-flammable

