



SARASWATI AUTO ALLIED

VECTRA

POSITIVE ADDITIVES

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The lead-acid Battery has different characteristics that make it attractive for many applications. These include high specific power, power density & volumetric energy Density. However, lead –acid Battery has low specific energy i.e. Energy per unit weight. The major reason for this limitation is that much of the active material is not fully discharged. Therefore, there is always a requirement of using conductive and non-conductive additives in different doses, which results to improve the performance of active material during charge discharge cycle. A typical positive active material has a blend of conductive & non-conductive materials .The non-conductive additives have the larger size then the Lead Oxide and are effective in displacing Active Material without seriously decreasing the critical volume fraction. On the other hand the conductive additives have the small particles with the Lead Oxide particles.

Calcium Sulfate

Calcium sulphate added to the positive material of flat or tubular plates of lead/acid batteries **significantly improves performance at high rates of discharge.** When the tubular electrodes are cycled, the capacity of the ground positive active- material is gradually restored. Cycle- life increased as a function of the content of calcium sulfate. **The addition of calcium sulfate increases the rate of red sulfate nucleation during discharge and modifies the B-PBO₂ and lead sulfate structure .** The positive active-material contain region of crystalline lead dioxide, as well as regions of amorphous, hydrated, lead oxide called Gel. The calcium ions increase the gel: crystal ratio in the positive active-material and act as binder for the skeletal structure of the material. **Calcium sulfate in paste improves the cold cranking ability of automotive batteries.**

Titanium Sub Oxide

TITANIUM SUB OXIDE is a conductive additive used as a current collector in Lead Acid Battery. **The Honey Combed structure of TITANIUM SUB OXIDE holds the paste and thereby improves the paste adhesion and the electrical conductivity as well as the mechanical stability of pasted plate** TITANIUM SUB OXIDE is also stable at the potentials of the positive plate.

Graphite

Small quantity of Graphite enhances the formation by increasing the conductivity of the paste. It also promotes the formation of alpha particles of Positive Active Material, which results in better coarseness and porosity. It also helps in the decreasing of gas evolution on the initial stage. **Graphite helps in increasing the capacity & initial utilization of Positive Active Material.**

Sodium Sulfate

Sodium sulfate is not isomorphous with lead sulfate and is more soluble. When Sodium Sulfate used as an additive it decreases the solubility of lead sulfate due to common ion effect which result in reducing the number of failure from shorting when the battery is deeply discharged. SS increases utilization of material by dissolving to create a more porous structure in the positive plate. **A very less quantity of Sodium Sulfate in the positive plate can improve the higher initial capacity and average capacity per cycle.**

FLUOROALKANE SULFONATES

It improves the capacity during charge discharge cycles and improves the plasticity and binding of Positive Active Material. it results in to improve life cycle, capacity and low temperature performance of Lead Acid Battery

HOLLOW GLASS MICROSPHERES

It improves the specific energy of the Plates.
Hollow Glass Micro spheres lower the density of the Positive Plates so that the amount of active material is reduced while the surface area and Pore volume remains essentially unchanged results **in more electrolytes per gm of Active material.**

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Method of use

VECTRA is available for standard solutions of positive plate ingredient for Automotive, Industrial, Traction and Locomotive batteries.

Take one Tailor-Made sachet of **VECTRA** and mix it homogenously with lead oxide, sulfuric acid and De-Mineralized Water.