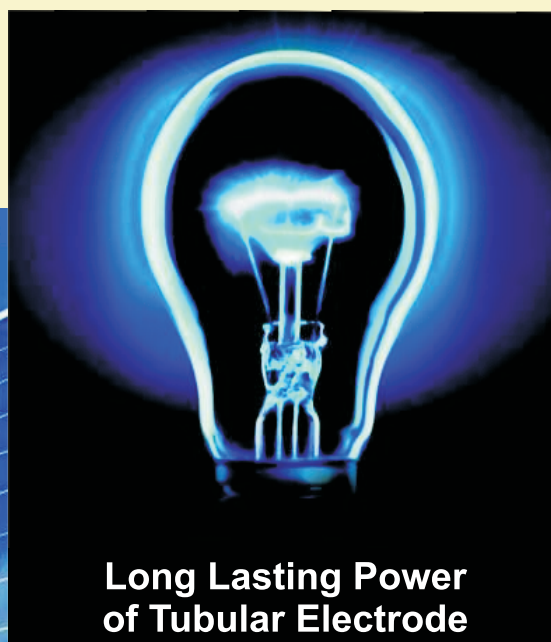




TUBULAR POSITIVE ADDITIVE :
(For Tubular Positive Dry Blend Filling)
20-25% Extra Backup Guarantee.
Optimum Oxide Material Maximum Utilisation



**Long Lasting Power
of Tubular Electrode**

The effect of addition of Tubular Positive Additive shows when the tubular electrodes were cycled; the capacity of the ground positive active material was gradually restored. Energy density of Active material & Cycle life increased as a function of the contact of Tubular positive additive. The active material on the positive plates is mainly a mixture of lead oxide and Red Oxide. In regular formulation, some of the active material will be underutilized due to non porous structure, Lack of Tetra basic lead sulfate Crystals Structure. In order to achieve a porous structure with a high surface area for the electro-chemical process, the Tubular positive plates undergo a high temperature curing process to transform the lead oxide and lead sulfate into Tetra basic lead sulfate.

There is however limitations due to the large size of the Tetra basic lead sulfate crystals. This can lead to a major disadvantage with Tetra basic lead sulfate namely a prolonged and higher electrical energy requirement for the formation of the positive plates and less surface area for the electro-chemical processes. We suggest that after dry blend filling dip Tubular Positive electrodes in 1.150 Specific gravity of H₂SO₄ and then cured at 85°C for 4-5 24 hours in oven to form tetra basic Lead Sulfate crystals and alpha PbO₂. The tetra basic lead sulfate has sizes up to 2 to 3-20 micron. Tubular positive additive leads into Uniform crystal size and increase in specific surface area. The formation of a homogenous tetra-basic sulfate crystal structure in the Tubular positive plates of lead-acid batteries is well known to offer significant electrochemical improvements in battery performance in respect of improved cycling and battery life.

By addition of Tubular Positive Additive a number of crystal seed sites are created, this leads to a large number of relatively even tetra-basic lead sulfate crystals. It has been found that only a relatively short treatment of 3 to 4 hours is required to fully develop the crystal structure in the oven. Without addition of Tubular Positive Additive in the blend Conventional method of Oven Chamber Heat Treatment Tetra basic curing process leads in the appearance of relatively large Tetra basic lead sulfate crystals. Up to now it has not been possible to control precisely the size of the final Tetra basic lead sulfate crystals.

The uncontrolled Tetra basic crystal growth leads to a reduction in the active surface of the plate. A high specific surface area is demanded for good battery performance with respect to high current discharge capability.

The main feature of the Tubular Positive Additive is that the size of the final Tetra basic lead sulfate crystals can be controlled within the range from 4 to 15µm. Small crystals with a narrow distribution exhibit a larger specific surface in Tubular Positive Additive allows the reduction of the curing time by use of steam. It is a generally held belief that the reduction of the residual metallic lead is only achieved within such a curing step. It is easy to prove that the free lead reduction can place during the drying phase by ensuring that there is sufficient oxygen/air available. Nevertheless the appearance of large Tetra basic lead sulfate crystals of 50 µm and above give problems during formation and, reduce the specific surge area. It has been well tested that the addition of Tubular Positive Additive generates small and controlled sized Tetra basic lead sulfate crystals. The Tubular Positive Additive Contains a very fine-sized and specially treated Tetra basic lead sulfate with LR Grade Calcium Sulfate. Tubular Positive Additive can use in dry blend filling with 50% Red Oxide and 50% Grey Oxide ratio. Generally it has been found that a short steam cure of 4 to 5 hours with more than 80°C on the plates leads to a very well developed tetra-basic crystal structure and helps to improve the adherence of the paste on the grid, especially if the more corrosion resistant lead alloys are used. Thereafter, the plates are curing that was implemented to speed up the free lead reduction. It has also found to be important to have a good air circulation during the final drying to ensure the reaction of the small parts of residual free lead content below 1% by use of Tubular Positive Additive effect of a homogenous crystal structure with a uniform and high porosity with good penetration of the acid into the active material provides an excellent positive plate for the lead-acid battery performance. The pore diameter is bigger and supports the acid exchange within the pores. Porosity values of more than 50 % are indicating improved deep discharge performances due to the good acid transport within the whole surface area.

About 10% Higher Initial Capacity & 6% higher average capacity is clearly differentiable between the cells containing Tubular Positive Additive & cells without Tubular Positive Additive. It can be observed immediately by testing difference of previous lots and addition of Tubular Positive additive lots. By the Use of Tubular Positive Additive stable Positive active mass structure Obtained. The battery performance is increased and the cycling behavior is improved due to the Tetra basic lead sulfate with residual alpha-PbO₂ avoiding deep discharge. The most stable capacity PAM structure develops and it increases the rate of Lead Sulfate nucleation during discharge and modifies the beta-PbO and lead sulfate structure. Tubular Positive 2 additive increases the voltage at all concentrations and discharge rates, and the effect was more pronounced at higher currents and lower temperatures. Ultimately Shelf life of Tubular Lead Acid batteries is increased.

Dosage : 2.5 kg per 100 kg. of oxide Dry Blend mixture

Available Packing : 25 Kg HDPA Bag

Storage : Store in a cool & dry place

Chemical Lab | Battery Testing Equipment

