

HOW IT IS MADE:

THE LEAD ACID BATTERY - PART 7

PLATE PASTING

PASTING

The pasting stage involves applying active material to the grid. The grid acts as both a mechanical support and an electrical conductor. This step creates the plate. The plate is the main component of a lead-acid battery.

There are two ways to combine grids and active material as necessary:

Belt pasting is a technique used to paste individual panels resulting from grids' melting process.

In Drum pasting continuous strips of grids are produced with expansion, punching, or continuous casting systems.

BELT PASTER

It has a cotton strip. This strip supports the grids when pasting. There is also a hopper. It comes with toothed and paddle rollers. These rollers feed the paste onto the grid.

Two grids are set in a straight line on a mechanical separator. They are placed on a cotton belt. This belt moves them to the area where paste (active material) is applied. After that, they go to the transfer line. The belt then goes through scraping, washing, and pressing areas. This process gets the belt ready for the next pasting cycle.

An automatic system feeds the hopper. It has level control and rotating rollers. This system doses the right amount of active material. The material is used on the grid below.

This system works well with melted grids. It has a belt made of layered needled cotton. Even when the belt touches the paste, it hardly sticks to it.



Belt paster

Drum-pasting machine

In continuous strip grids, the active material is covered with paper. This is to handle the cutting process. It makes using a cotton belt unnecessary. This is because it helps prevent sticking. So, a surface-hardened steel drum is used instead. It lasts much longer. This means there's no need to worry about belt wear costs.

The machine will have a body made out of a steel drum. It will feature controlled speed. Additionally, it will have a hopper designed to measure out the active material. It will need drums to hold and spread the paste on the plate surfaces. First, a paper layer is placed on the drum. Then, the strip of grids moves under the hopper to get the right amount of paste. While moving at the drum's speed, it goes under another rubber cylinder. This cylinder centers and presses the paper on the top side.



GRID STRIP DIVISION SYSTEM

The pasted grids are put into a machine. This machine has timing systems and cutting blades. It cuts the individual grids by slicing through their connection points. The machine has a bench for holding and supporting the cut grids. There is another bench for aligning the grids side by side. This preparation is for their next treatments.

DRYING TUNNEL

After stacking, the plates quickly go through a special drying tunnel. This prevents them from sticking to each other. The tunnel heats the surfaces of the plates quickly. But, it keeps the core of the plates below 60 °C. This is done to dry any paste residues on the surface that could cause sticking during stacking.



STACKING SYSTEM

A stacker with suction picks up the plates from the drying tunnel. It separates the plates and straightens them at the edges. Then, it moves the plates to where they are prepared for packaging. Here, two devices that can adjust their height pick up the plates. They stack the plates into packages. These packages are then gathered and placed on a pallet.

A double amount of lowering devices is required. We use one to prepare the package and the other to unload and restore operations. At this point, the plates have a lead grid. This grid offers mechanical support and helps with electron flow. Inside, there's a mix of different materials (Pb, PbO, PbO₂, PbSO₄, H₂SO₄, H₂O). Also included are specific additives for either negative or positive plates. These components are crucial. They form what is known as the active material.



Reference

Batteries Step by Step: The Lead-Acid Battery SOVEMA: Equipment for Lead Acid Batteries.