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AN OVERVIEW OF LEAD-ACID BATTERIES

Thanks to their longevity, durability, and reliability, lead-acid batteries are a preferred choice for motive power applications. Providing reliable power to electric forklift trucks for material handling, airport tuggers, and even resurfacing the ice at hockey rinks, lead-acid batteries are probably at work in more applications than realized!

WHAT ARE LEAD-ACID BATTERIES?

Lead-acid batteries are rechargeable batteries that use lead and sulfuric acid to charge and discharge electrical energy. When lead is submerged in sulfuric acid, it creates a controlled chemical reaction. The reaction then causes the battery to generate electricity. This reaction can then be reversed to recharge the battery later on.

The main materials needed to build a lead-acid battery include:

- **Lead peroxide (PbO_2):** the dark brown, hard, and brittle substance that forms the positively charged plate
- **Sponge lead (Pb):** pure lead in a soft sponge condition that acts as the negatively charged plate
- **Dilute sulfuric acid (H_2SO_4):** with a 3:1 ratio of acid to water, a majority of the heat released in dilution comes from the hydration of the hydrogen ions. It is highly ionized, a strong acid, and a good electrolyte

Put these elements together and you get a highly powerful battery that has been tried, tested, and improved since its inception in 1859.

BENEFITS OF LEAD-ACID BATTERIES

- Cost: lead-acid batteries provide major cost efficiencies compared to lithium-based counterparts.
- Reliability: made from a proven and well-understood technology. When crafted conscientiously, lead-acid batteries are extremely durable and provide long-lasting service.
- Low Self-Discharge: lead-acid batteries have one of the lowest rates of self-discharge among rechargeable battery systems at about 40% per year.
- High Discharge Rates: lead-acid batteries have the capacity for high discharge rates.

WHAT INDUSTRIES RELY ON LEAD-ACID BATTERIES?

Although lead-acid batteries have been around since the 1800s, they are still popularly used in their improved form today across a range of fields. Just a few of these industries include:

FORKLIFTS

AIRCRAFT TUGS

ZAMBONIS

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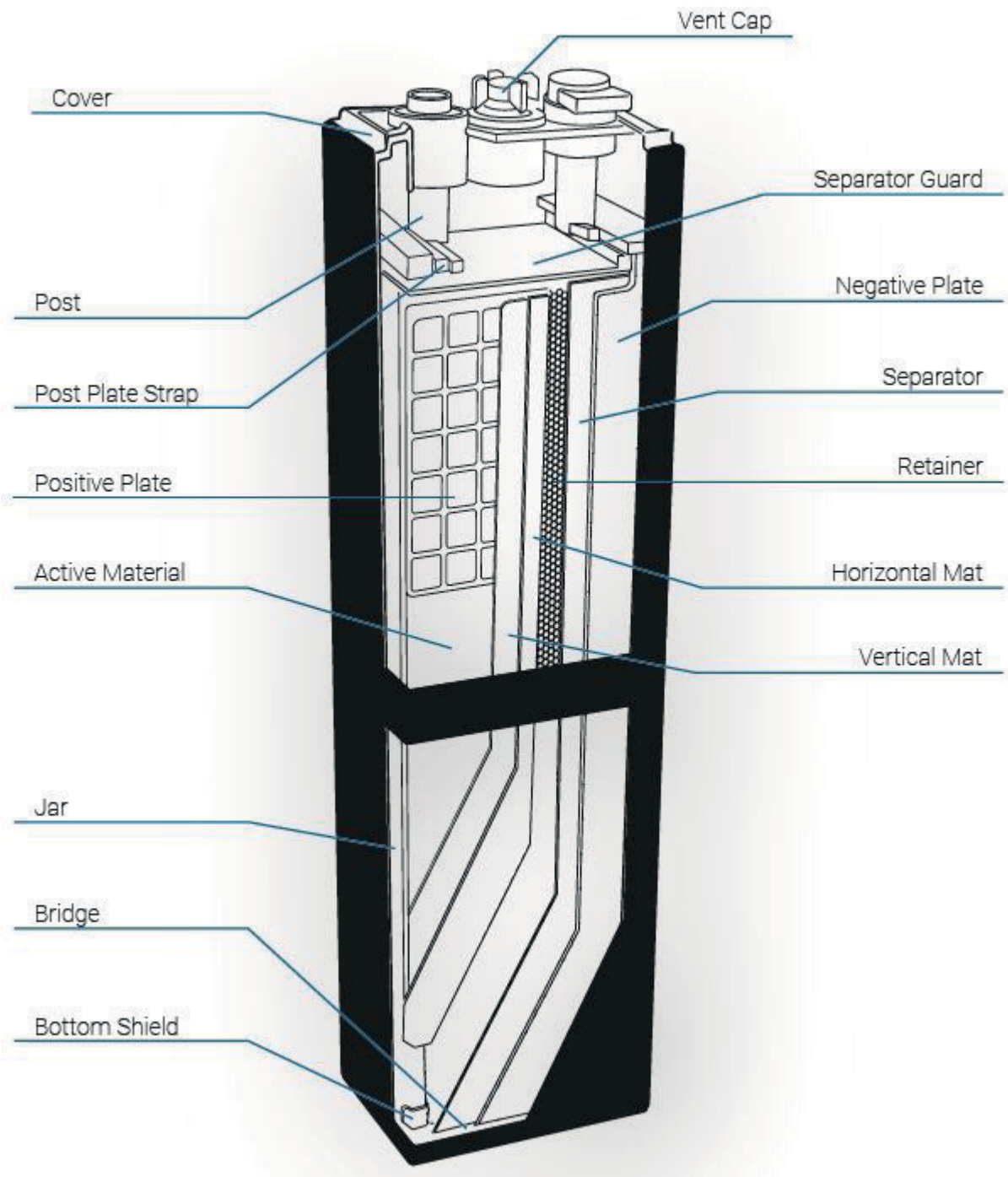
INSIDE VIEW OF A LEAD-ACID BATTERY



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