HOPPECKE
POWER FROM INNOVATION

CLEAN LEAD

Lead-acid batteries

Accumulators in **lead-acid technology** have been around for more than 165 years - nevertheless modern lead-acid batteries are anything but an old hat. HOPPECKE has continuously developed the technology and the manufacturing processes to meet current and future requirements.

In addition to qualities such as performance, load capacity and reliability - which have long been the hallmark of these batteries - further progress has been made in recent years in terms of sustainability and the reduction of environmental impact.

With our take-back system for used batteries, our own metal smelter and manufacturing to the latest standards under the most stringent environmental regulations, we ensure that a sustainable circular economy is achieved. At HOPPECKE, recycled lead is turned into new batteries in this way.

Recycled lead = CLEAN LEAD

CLEAN LEAD

The lead-acid battery portfolio manufactured by HOPPECKE uniquely combines proven and current advantages of the technology. The key words here are robust, resilient, recyclable - but what does that mean in detail?

Advantages of the lead-acid technology

ROBUST

Batteries in lead-acid technology are characterized by a high load capacity in practical use. They are suitable for many years of reliable task fulfilment as energy storage devices, and they remain operational under exceptional conditions, such as after an earthquake, for example. That's why energy network operators and power plants are relying on this technology to secure their own power supply with this technology - worldwide.

Did you know?

The word "robust" has its origins in Latin and is derived from the Latin word "robustus", which means "strong and robust" and literally translates as "as strong as oak". This term goes back to the Latin word "robur", which stands for heartwood, hard wood, oak, hardness, strength and vigour. The original meaning of "robust" therefore refers to the qualities of durability, strength and hardness associated with the robust heartwood of oak.

With the reserve current of the batteries, power plants can thus be shut down in a controlled manner in the event of an incident and put into a safe state. The robustness of the lead-acid battery is the main argument for choosing this technology over others.

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Did you know?

The word "resilience" has its origins in Latin and comes from the word "resilire", which means "to bounce back" or "to rebound". Resilience describes the ability to withstand stress and negative influences. People or systems that possess resilience are able to maintain or quickly restore their ability to function under stress and recover.
In contrast to robustness, resilience goes beyond simple resistance by emphasising active adaptability

RESILIENT

Storage systems with batteries using lead-acid technology are characterized by a high degree of **intrinsic safety**. A so-called thermal runaway with a fire of the entire storage system is unknown for this technology.
For this reason, among others lead-acid batteries do not require additional electronics for complex battery management. This is because exceptional loads or short, temporary operating conditions outside the specification do not usually mean that the batteries will fail or be massively damaged.

This **resilience** is one of the many reasons why lead-acid batteries are used in uninterruptible power supplies, for example in data centers. Here the batteries bridge the time between the loss of the power grid and the start of diesel generators, which take some time to supply the data center with sufficient power. Incidentally, the high intrinsic safety of lead batteries is also reflected in the international transport regulations for hazardous goods, so they can also be transported by air freight without massive restrictions.

RECYCLABLE

Lead batteries can be **recycled** in a closed loop. There is already a functioning Circular economy - old lead-acid batteries are collected by certified collection companies and recycled. In a comparison with other battery technologies, lead-acid technology comes out on top here, because the recovery of raw materials is only really easy simple and economically viable withlead-acid batteries and economically viable: The recycled lead is of the best quality as a raw material for new batteries.

Did you know?

The word "**recycle**" has its origins in English and is derived from "to recycle", formed from the English "cycle" (from the Latin "cyclus" for circle) and "re" (from the Latin "re-" as a prefix for back or again). The word "recycle" means that something is suitable to be introduced into the cycle of reuse and is suitable for remanufacturing or reprocessing. Materials can be recycled either in parts (raw materials) or as a whole and processed into new products or reused in a different context.

HOPPECKE is active in this area: we collect used lead batteries from customers and transport them to the recycling plant in Hoppecke. The batteries are then professionally recycled. For more than 60 years, we have been operating our own metal smelter, where we recover lead from old batteries and feed it directly into the production of new lead-acid batteries. The state-of-the-art facilities in the metal smelter and in battery production meet all the stringent environmental requirements at the German site, are continuously expanded and operated in line with the latest state-of-the-art technology. We can therefore state with conviction that lead batteries from HOPPECKE are produced out of recycled lead at a sustainably high level.

In sum, this means - modern lead-acid batteries are

Robust
Resilient
Recyclable

Conclusion

At HOPPECKE, recycled lead (= CLEAN LEAD) is turned into new batteries with modern properties and advantages for many markets and applications.

A well-rounded solution over the entire life cycle: from raw material to production and many years of use - in which lead batteries show that they are **R**OBUST and **R**ESILIENT - to recycling, which proves that they are **R**ECYCLABLE, and even as often as you like.

This is precisely why lead-acid batteries produced by HOPPECKE rightly bear the seal:

CLEAN LEAD | R³