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## rail | Lead-Acid

Proven battery technology  
for rail applications



## Power is our passion ...

You are looking at the results of 90 years' work. 90 years of passion for innovative solutions for mobile power supplies – 90 years of German engineering skill and the aim of never being satisfied with what we have already achieved.

This is only possible thanks to the employees, who continuously support us along this path. Together with our business partners, we have continued to push the limits forwards and ensure that the impossibilities of yesterday have now become a jointly achieved reality.

Only through our partnership with you, we are able to create the perfect symbiosis of economically optimised solutions and state-of-the-art technological products.

With our structure of nearly 2000 employees at more than 20 locations around the world, we are always close to you and keep our finger on the pulse of pioneering innovations. Flexibility in the design of your projects and extremely reliable products are our every day aims. With highly available local service we have ensured a thorough understanding of your special challenges for decades.

**If you expect more than just a product but a competent partner who is always at your side, HOPPECKE is the right choice for you.**

## Your strategic partner for rail applications

HOPPECKE has been manufacturing lead-acid batteries since 1927. In all this time we have continuously researched and developed the technology and constantly optimised it. That is why our modern lead batteries are far from being left in the sidings, they are in fact genuine high-tech products, ready for the 21st century!

Our batteries reliably secure the electrical supply to trains in an emergency. A train can still be safely stopped, the doors opened and important functions such as lighting, ventilation and radio will remain in operation, even in the event of a power failure.

In addition to safety and performance, HOPPECKE lead-acid batteries are characterised by a long service life and low maintenance requirements. Our rail | power AGM batteries, for example, do not need to be refilled with water.

Lead-acid batteries are ideal for use in moderate climatic conditions (-25°C to +40°C). Besides low acquisition costs, their operating costs are also low. Lead-acid batteries have proven themselves in operation for decades. They are uncomplicated and durable in use and therefore the ideal all-rounder for a wide range of on-board applications within rolling stock.

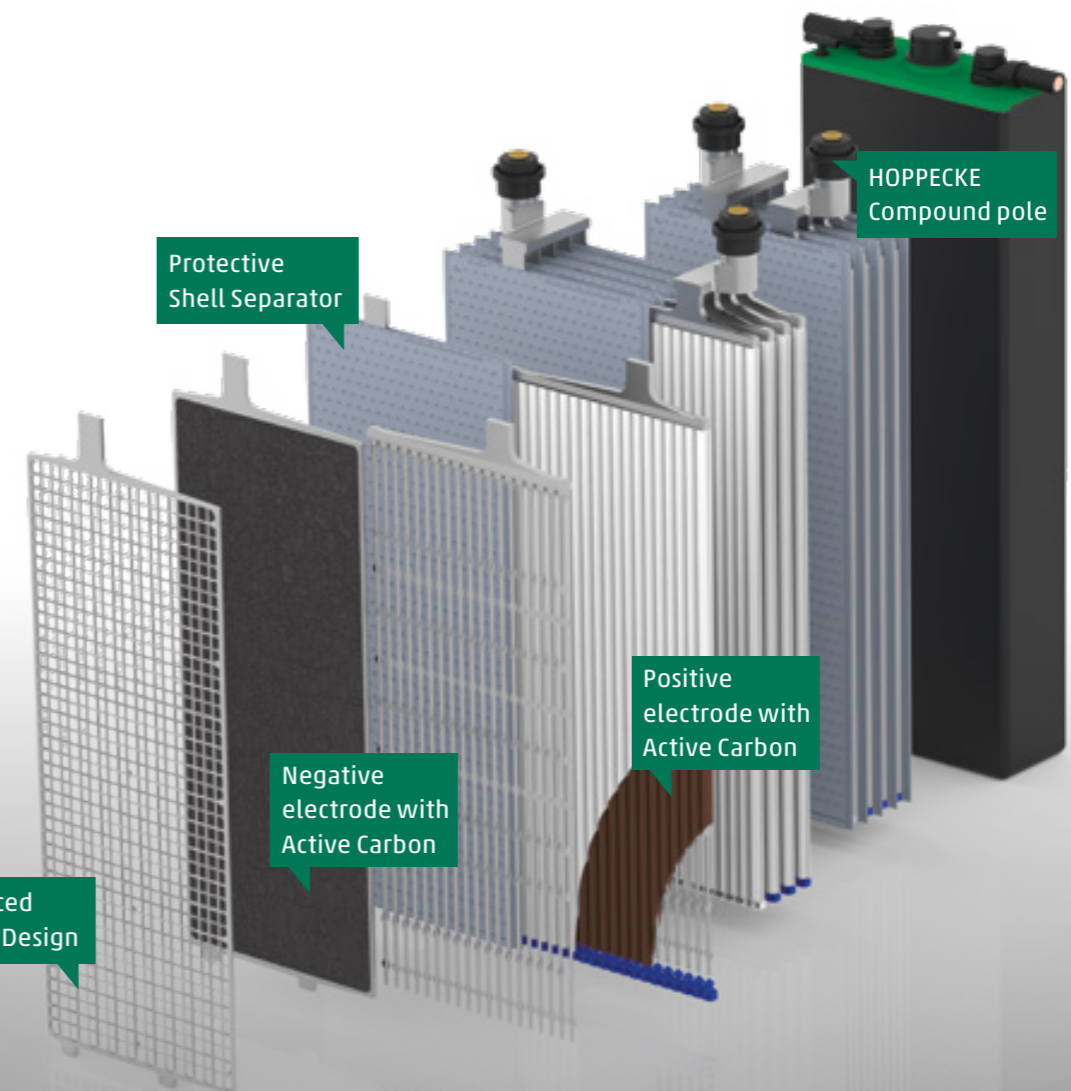
## Tubular plate technology

### rail | power PzS

The HPzS tubular plate technology (DIN format) optimised by HOPPECKE is suitable for universal use in rail transport. But rail | power PzS is by no means just a standard product. All components for the current series have been continuously developed based on experience gained over decades. So every cell contains HOPPECKE's entire lead-acid know-how. "Active carbon" is an essential component of rail | power PzS batteries. These specially matched active materials, combined with other innovative developments like our 3D enhanced electrode design and protective shell separator, ensure a longer service life with less maintenance and increased performance.



Even the top of the batteries is well designed. They be optionally equipped with an automatic central water refill system to minimise maintenance duration. They feature a terminal with brass insert and special seal, so that optimal electrical conductivity and tightness are guaranteed over their entire service life. The batteries can



### Ideal for use as on-board batteries:

- ▶ Where a simple, cost-effective solution is needed
- ▶ When a long cycle lifetime is required
- ▶ As replacements for existing batteries (standard DIN format)

### Your advantages rail | power PzS

- ▶ The protective shell separator effectively prevents short-circuits caused by mousing
- ▶ High cycle stability
- ▶ Long service life
- ▶ Top quality – low acquisition costs

## Fleece ESS battery technology

### rail | power AGM

The design principle for rail | power AGM batteries is based on a valve-regulated construction with internal gas recombination using grid plates and fixing of the electrolyte in a glass fibre fleece (AGM - Absorbent Glass Mat). This eliminates the need for refilling with water.

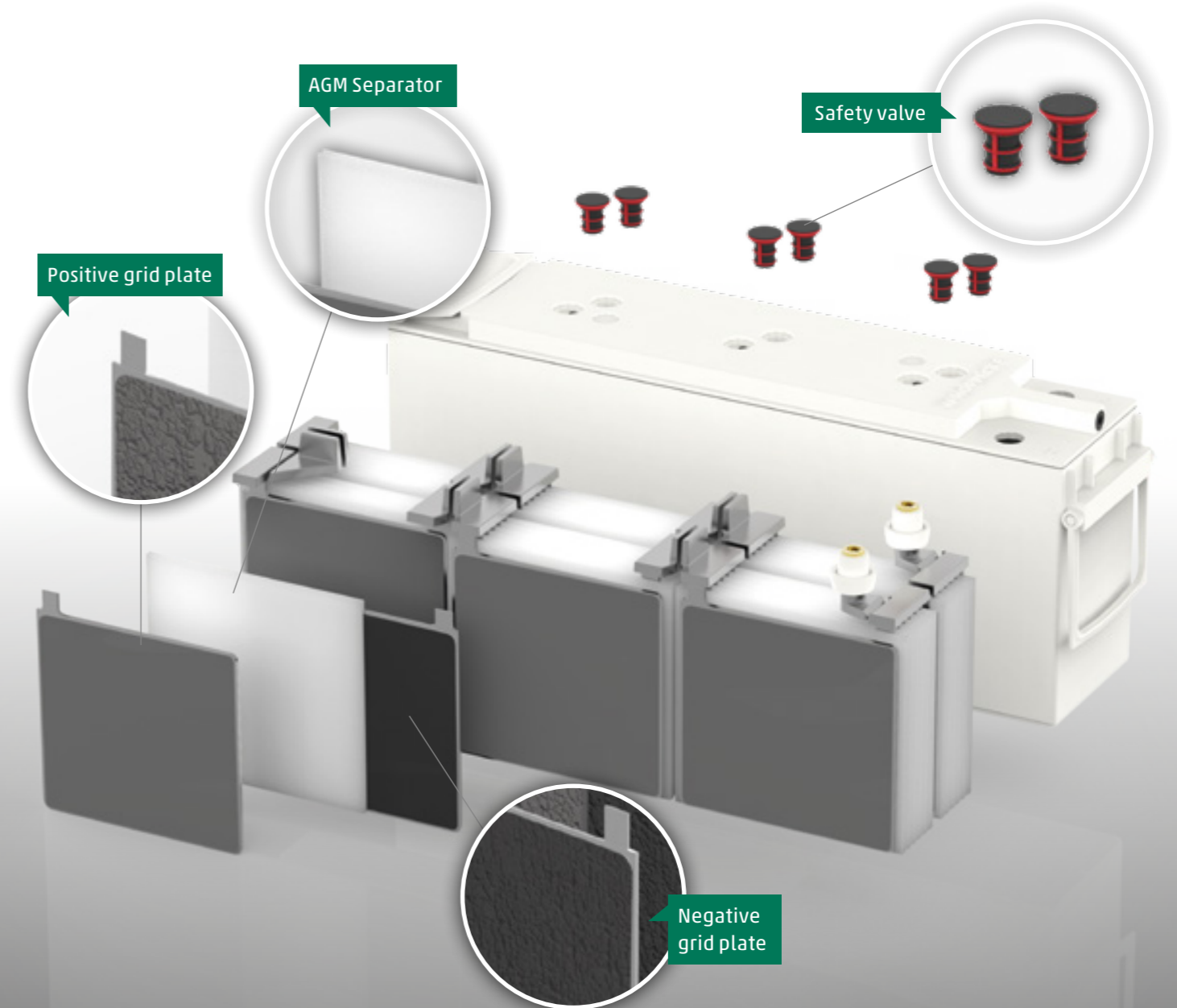
The high energy density of these batteries results in a very low space requirement, so they enable maximum utilisation of installation space. AGM batteries simultaneously

provide very high performance. They can therefore be used as on-board batteries as well as for starting applications. All rail | power AGM batteries are equipped with HOPPECKE ESS technology (extended stability standard).



Addition of gel to the electrolyte combines the durability of gel batteries with the performance of AGM technology. These batteries therefore have a better thermal behaviour. Thermal runaway, an uncontrolled overheating of the battery, is effectively excluded.

Our batteries feature very good stability, even in difficult ambient conditions. Their compact and compressed internal design results in the active mass being held firmly in the electrode, even in the case of high cyclic load and under shock and vibration.



#### Use as an on-board or starter battery:

- ▶ In high-power applications through to starting applications
- ▶ In case of limited installation space
- ▶ Where minimal maintenance is required

#### Your advantages rail | power AGM

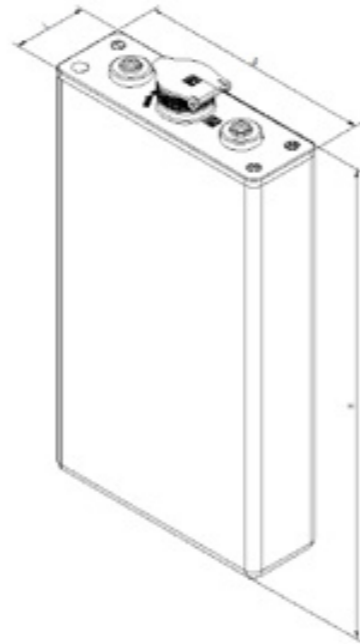
- ▶ Maintenance-free regarding water refilling
- ▶ Leakproof
- ▶ Compact design

# Technical data

## rail | power PzS

	Capacity [Ah]*	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Case material
2H PzS 120	120	47	198	370	8.00	PP
3H PzS 180	180	65	198	370	11.60	PP
4H PzS 240	240	83	198	370	14.90	PP
5H PzS 300	300	101	198	370	18.40	PP
6H PzS 360	360	119	198	370	21.90	PP
7H PzS 420	420	137	198	370	25.30	PP
8H PzS 480	480	155	198	370	28.90	PP
9H PzS 540	540	173	198	370	32.30	PP
10H PzS 600	600	191	198	370	35.80	PP
2H PzS 160	160	47	198	430	9.90	PP
3H PzS 240	240	65	198	430	13.90	PP
4H PzS 320	320	83	198	430	17.90	PP
5H PzS 400	400	101	198	430	22.00	PP
6H PzS 480	480	119	198	430	26.20	PP
7H PzS 560	560	137	198	430	30.30	PP
8H PzS 640	640	155	198	430	34.30	PP
9H PzS 720	720	173	198	430	38.40	PP
10H PzS 800	800	191	198	430	42.40	PP

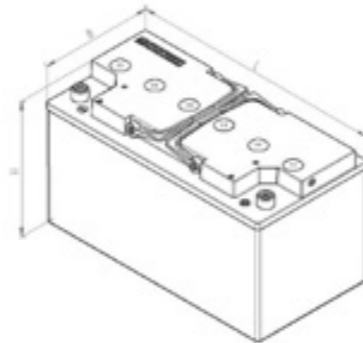
\*at 30°C final discharge voltage 1.7V/cell



## rail | power AGM 12V top terminal

	Voltage [V]	Capacity [Ah]*	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Case material
AGM 12V58	12	58	267	177	190	23.00	PP
AGM 12V78	12	78	342	177	190	31.00	PP
AGM 12V115	12	115	344	170	275	46.00	PP

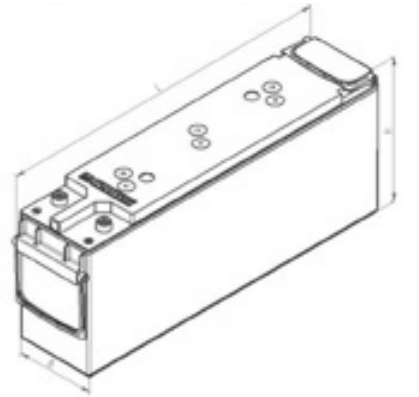
\*C5 at 20°C final discharge voltage 1.6V/cell



## rail | power AGM 12V front terminal

	Voltage [V]	Capacity [Ah]*	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Case material
AGM 12V100	12	100	541	125	217	38.50	ABS
AGM 12V130	12	130	541	125	302	58.40	ABS
AGM 12V150	12	150	541	125	302	59.70	ABS
AGM 12V170	12	170	541	125	302	61.10	ABS

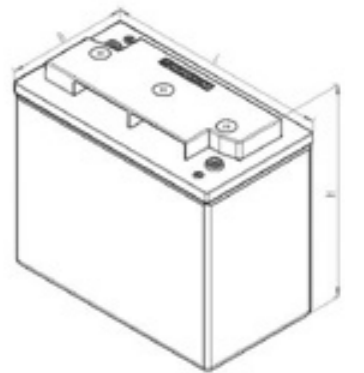
\*C5 at 20°C final discharge voltage 1.6V/cell



## rail | power AGM 6V

	Voltage [V]	Capacity [Ah]*	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Case material
AGM 6V170	6	170	242	170	275	32.00	PP
AGM 6V220	6	220	308	170	275	41.00	PP

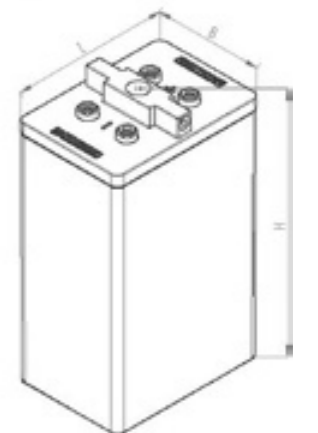
\*C5 at 20°C final discharge voltage 1.6V/cell



## rail | power AGM 2V

	Voltage [V]	Capacity [Ah]*	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Case material
AGM 2V220	2	220	183	90	310	14.40	ABS
AGM 2V308	2	308	183	129	310	21.70	ABS
AGM 2V375	2	375	183	155	310	25.00	ABS

\*C5 at 20°C final discharge voltage 1.6V/cell





## Environmental protection right from the start

### We support a sustainable future

We are all united by one conviction: only by reconsidering the environment and acting accordingly can we bequeath a future worth living to our successor generations.

We at HOPPECKE are aware of this responsibility toward the environment and society. The topic of efficient resource management at HOPPECKE has been firmly anchored in the company's principles for decades. We are responsible for the resources entrusted to us – people, environment and raw materials.

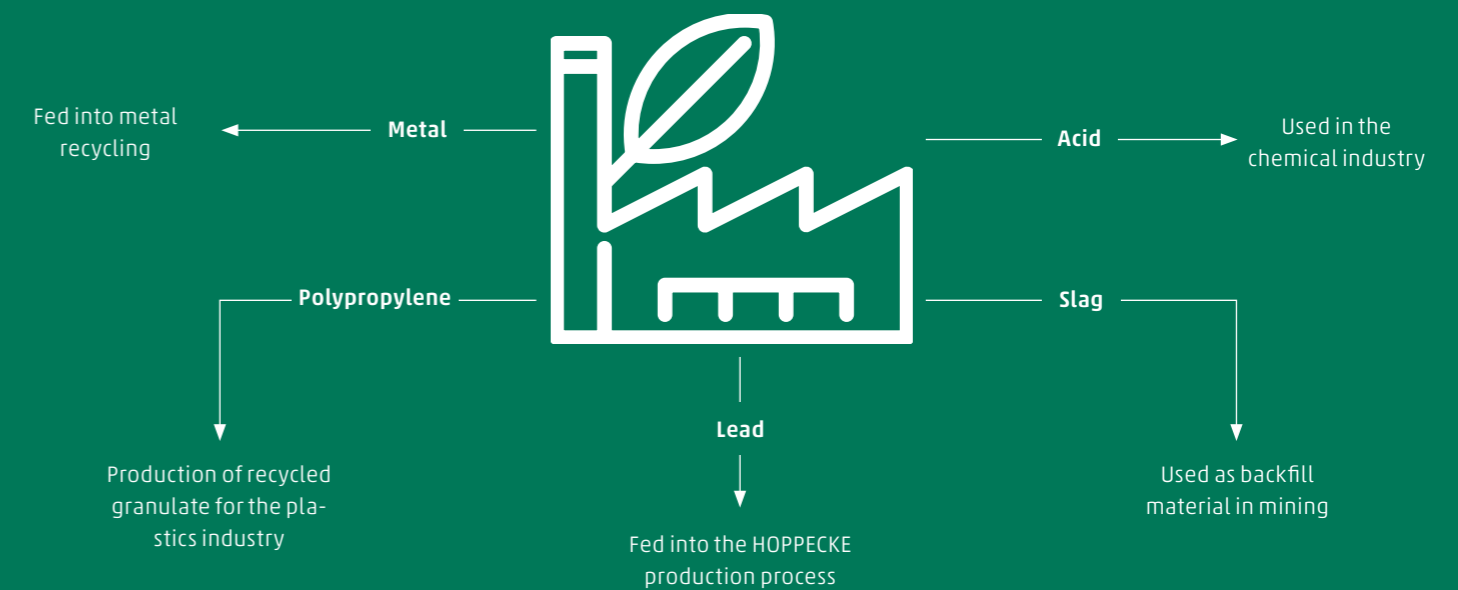
### Closed economic and recycling loop

100% HOPPECKE: we demonstrate our competence throughout our lead batteries' entire value chain. We are the only European manufacturer of industrial batteries to realise a closed economic and battery recycling loop.

It all starts with the production of the raw lead by recycling used batteries in our own smelter at HOPPECKE headquarters. Our lead-acid products are developed in Germany and manufactured worldwide in our own factories.

We have been operating our own smelter for over 55 years. Our existing facilities are ultra modern and undergo permanent expanding.

## And what happens to the components?



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