



## **Batteries for Rail Traffic**

# BAE *SPECIAL RAIL*

## Application

BAE Railway batteries backup the energy supply of railway vehicles. In case of a black out the batteries provide energy for control units and to maintain safety technologies within coaches and locomotives like emergency lights and air conditions. In Diesel train sets the battery additionally is needed for starting the engine.

## System solutions for railway applications based on lead-acid batteries

BAE produces lead-acid batteries for railway applications and fulfills highest requirements for applications within a wide range of railway battery applications like regional trains, locomotives, high speed trains or tram vehicles. Mostly BAE delivers railway batteries pre-assembled in trays or crates according to customer demands.



## Specific lead-acid battery technologies to meet specific requirements in railway applications

The BAE product range for railway traffic comprises traditional vented lead-acid batteries (VLA > **BAE SPECIAL RAIL PzS**) and valve regulated lead-acid GEL batteries (VRLA > **BAE SPECIAL RAIL PzV**).

The life of a railway battery typically is characterized by getting partially cycled with different depths of discharge (DOD).

Therefore the battery life time depends on specific circumstances. BAE railway batteries of PzS range usually provides the required energy over 4 to 8 years. PzV batteries reach a life time of 3 to 6 years.

BAE VRLA batteries are well suited for wide temperature ranges. Permanent ambient temperatures of 45 °C during summer-time and down to -20 °C in winter times are acceptable for these batteries.

# BAE *SPECIAL RAIL*

## Technical Data

### VRLA batteries

Dimensions as recommended in the standard of DIN EN 60254-2. For special requirements BAE can provide customized solutions like special sizes and also low case design.

Cell type 2 Volt-cell positive tubular plate	Capacity Ah* C <sub>5</sub>	Dimensions				Weight kg**
		W mm	L mm	H1 mm	H2 mm	
2 PzV 110	110	47	198	340	370	9.0
3 PzV 165	165	65	198	340	370	12.7
4 PzV 220	220	83	198	340	370	16.7
5 PzV 275	275	101	198	340	370	20.5
6 PzV 330	330	119	198	340	370	24.2
7 PzV 385	385	137	198	340	370	28.0
8 PzV 440	440	155	198	340	370	32.0
9 PzV 495	495	173	198	340	370	35.6
10 PzV 550	550	191	198	340	370	39.7
2 PzV 150	150	47	198	445	472	11.6
3 PzV 225	225	65	198	445	472	16.4
4 PzV 300	300	83	198	445	472	20.7
5 PzV 375	375	101	198	445	472	25.3
6 PzV 450	450	119	198	445	472	30.3
7 PzV 525	525	137	198	445	472	35.1
3 PzV 330	330	65	198	592	622	26.1
4 PzV 440	440	83	198	592	622	32.8
5 PzV 550	550	101	198	592	622	40.1
3 PzV 375	375	65	198	696	723	30.3
4 PzV 500	500	83	198	696	723	38.0

All data are subject to alterations. Further cell types available on request.

\* 30°C acc. to DIN EN 60254-1

\*\* filled and charged ± 5 %

# BAE *SPECIAL RAIL* Batteries and Accessories

All VRLA batteries are maintenance-free concerning water refilling. During the whole battery life water must not be refilled in any VRLA cell.

## Battery trays and accessories



Typically steel trays (crates) are used in railway vehicles. Battery trays made of plastic are also used in railway applications and available at BAE. Especially in Germany plastic trays are quite common.

A steel tray is a welded construction coated with electrolyte proof plastic. It is designed especially to accommodate the battery inside the vehicle.

Trays of plastic are designed according to DIN 43579 part 1, 2, 3 and part 4.

Special solutions are available on request.



## Terminal



The right choice of plugs and clamps is depending on each specific application. BAE offers a great variation of connection sets. Railway light clamps acc. to DIN 43579 part 3 can be provided.

BAE has developed its own terminal system for special requirements such as high currents up to 1,600 A.

## Temperature probe



BAE recommends installing a temperature probe for optimum charging. Temperature measurements of VRLA cells can be done whether on the cell sidewalls or straight on the pole.

For VLA cells the temperature has to be measured direct inside the electrolyte. The battery can be equipped with complete assembled terminal set inclusively temperature probe.

# BAE *SPECIAL RAIL*

## Fire, Quality and Environmental Requirements

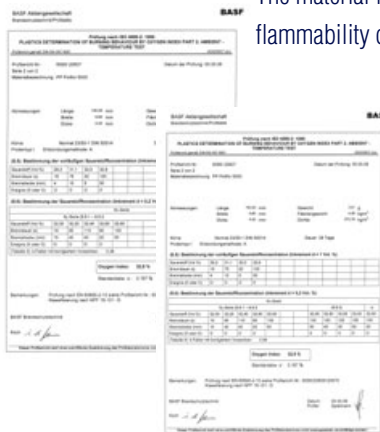
Many railway applications have very high fire and safety requirements due to the typically limited emergency options (examples: railway traffic in tunnels or over bridges).

By using flame retardant materials such as self-extinguishing and low fume creating materials BAE can make a contribution to reduce the fire load in railway vehicles.

### Fire protection requirements

On customer request we can also produce batteries using container acc. to NFF 16101/16102.

The material is certified acc. to this French standard. Tests made at independent authorized labs confirm a flammability class of I3 and a toxicity detection class of F2.



### High quality manufacturing

All batteries for railway applications are made in our own production facility in Berlin, Germany. There is the whole production from electrodes up to the final battery. BAE is certified according to DIN EN ISO 9001:2008. The BAE quality department assures a constant high quality while the BAE R&D department develops customized battery solutions. The optimization of single production steps leads into a higher quality and improves the products for our customers.



### Environmental protection

BAE is certified acc. to DIN EN ISO 14001. So we continuously supervise and improve all environmental issues at BAE. All processes are constantly proofed regarding the environmental impact and the BAE environmental policy of BAE.



Of course BAE takes back used batteries and bring it into the recycling process.

# BAE *SPECIAL RAIL*

BAE is a company with a long term tradition. We have been producing batteries at this location for more than 100 years.



BAE is providing full support to our customers. That means that BAE isn't only producing just the battery. BAE is supporting the customers and users also in the design phase and can also provide battery systems.

Lead-acid battery systems have quite low initial costs compared to other technologies. Next to that also the maintenance costs are pretty low. Especially with VRLA cells the time-consuming process of water refilling is omitted.

The lead acid-batteries are produced according to the following standards:

DIN VDE 0510-1	DIN 43582 part 1 and part 2
DIN EN 60254 and IEC 60254 part 1 and part 2	DIN EN 61056 and IEC 61056 part 1 and part 2
DIN 43534	DIN EN 61429 and IEC 61429
DIN 43539 part 1 and part 5	DIN EN 60077 and IEC 60077
DIN 43579 part 1 to part 6	

BAE engineers also calculate the needed ventilation of the battery crates to accomplish a high standard of safety. To assure the correct dimension of the ventilation openings we recommend a calculation based on DIN EN 50272-3.

*Authorized Distributor*



**Infinitier Company Ltd.**

Room 601 Bupa Centre, 141 Connaught Road West,  
Hong Kong • Tel: +852 28571793 • Fax: +852 28571079  
<http://www.infinitier.com.hk>



BAE Batterien GmbH  
Wilhelminenhofstraße 69/70  
12459 Berlin · Germany  
P. O. Box 9 · 12442 Berlin  
Tel.: +49 (0) 30 53001-661  
Fax: +49 (0) 30 53001-667  
E-mail: [info@bae-berlin.de](mailto:info@bae-berlin.de)  
[www.bae-berlin.de](http://www.bae-berlin.de)