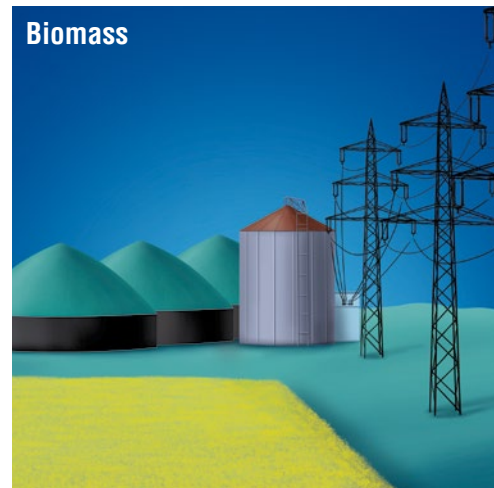
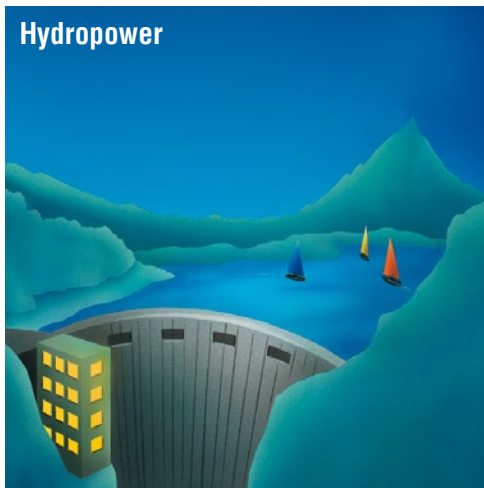
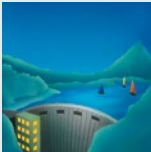
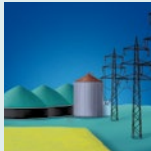




## Batteries for Renewable Energy Applications

# BAE *SECURA SOLAR* Batteries for Renewable En

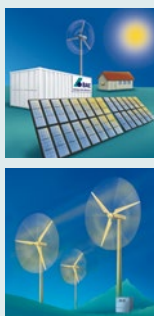
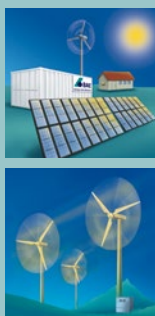
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|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applications</b>                                         |     |   |     |
| <b>Type</b>                                                 | <b>PVS Cells</b><br>                                                                                                                                                                                                                                  | <b>PVS Block</b><br>                                                                | <b>PVV Cells</b><br>                                                                                                                                                                                                                                        |
| <b>Technology</b>                                           | Vented (VLA)                                                                                                                                                                                                                                                                                                                            | Vented (VLA)                                                                                                                                                            | Valve regulated (VRLA)                                                                                                                                                                                                                                                                                                                          |
| <b>Maintenance</b>                                          | Low maintenance                                                                                                                                                                                                                                                                                                                         | Low maintenance                                                                                                                                                         | Maintenance free                                                                                                                                                                                                                                                                                                                                |
| <b>Nominal capacity (<math>C_{100}</math>)<sup>1)</sup></b> | 140 – 4,420 Ah                                                                                                                                                                                                                                                                                                                          | 70 – 430 Ah                                                                                                                                                             | 140 – 4,710 Ah                                                                                                                                                                                                                                                                                                                                  |
| <b>Nominal voltage</b>                                      | 2 V                                                                                                                                                                                                                                                                                                                                     | 12 V, 6 V                                                                                                                                                               | 2 V                                                                                                                                                                                                                                                                                                                                             |
| <b>Positive electrode</b>                                   | Tubular<br>Low antimony                                                                                                                                                                                                                                                                                                                 | Tubular<br>Low antimony                                                                                                                                                 | Tubular<br>Lead calcium                                                                                                                                                                                                                                                                                                                         |
| <b>Container (UL-94 rating)</b>                             | SAN (HB)                                                                                                                                                                                                                                                                                                                                | SAN (HB)                                                                                                                                                                | ABS (HB/V-0)                                                                                                                                                                                                                                                                                                                                    |
| <b>Electrolyte</b>                                          | Liquid                                                                                                                                                                                                                                                                                                                                  | Liquid                                                                                                                                                                  | GEL                                                                                                                                                                                                                                                                                                                                             |
| <b>Water-refilling-interval<sup>2)</sup></b>                | Up to 3 years                                                                                                                                                                                                                                                                                                                           | Up to 3 years                                                                                                                                                           | Maintenance free                                                                                                                                                                                                                                                                                                                                |
| <b>Horizontal operation (optional)</b>                      | N/A                                                                                                                                                                                                                                                                                                                                     | N/A                                                                                                                                                                     | Yes                                                                                                                                                                                                                                                                                                                                             |
| <b>Typical discharge time</b>                               | 1 – 240 h                                                                                                                                                                                                                                                                                                                               | 1 – 240 h                                                                                                                                                               | 1 – 240 h                                                                                                                                                                                                                                                                                                                                       |
| <b>Pole bushing</b>                                         | 100 % tight                                                                                                                                                                                                                                                                                                                             | 100 % tight                                                                                                                                                             | 100 % tight                                                                                                                                                                                                                                                                                                                                     |
| <b>Cycles IEC 60896-11/-21</b>                              | >1,500                                                                                                                                                                                                                                                                                                                                  | >1,200                                                                                                                                                                  | >1,500                                                                                                                                                                                                                                                                                                                                          |
| <b>Cycles IEC 61427 (at 40 °C)</b>                          | >3,150                                                                                                                                                                                                                                                                                                                                  | >2,700                                                                                                                                                                  | >3,000                                                                                                                                                                                                                                                                                                                                          |
| <b>Charge voltage at cyclic operation (V/cell)</b>          | 2.30 – 2.40                                                                                                                                                                                                                                                                                                                             | 2.30 – 2.40                                                                                                                                                             | 2.30 – 2.40                                                                                                                                                                                                                                                                                                                                     |
| <b>Float voltage at non cyclic operation (V/cell)</b>       | 2.23                                                                                                                                                                                                                                                                                                                                    | 2.23                                                                                                                                                                    | 2.25                                                                                                                                                                                                                                                                                                                                            |

Reference temperature: 20 °C

<sup>1)</sup> Capacity at 100 h discharge.

<sup>2)</sup> Reference values. The real water-refilling-interval for vented batteries depends on many factors, e.g. ambient temperature and specific battery operation.

# ergy Applications



## PPV Block



## SUNDEPOT



Valve regulated (VRLA)

Valve regulated (VRLA)

Maintenance free

Maintenance free

70 – 1,260 Ah

200 – 420 Ah

12 V, 6 V

24 V, 48 V

Tubular  
Lead calcium

Tubular  
Lead calcium

SAN/ABS (HB/V-O)

SAN/ABS (HB/V-O)

GEL

GEL

Maintenance free

Maintenance free

Yes

N/A

1 – 240 h

1 – 240 h

100 % tight

100 % tight

>1,500

>1,500

>2,100

>2,100

2.30 – 2.40

2.30 – 2.40

2.25

2.25

## Quality – Made in Germany

BAE SECURA SOLAR batteries are the perfect and safe choice for the energy supply in renewable energy applications such as photovoltaic power generation, stand-alone photovoltaic systems and hybrid applications. BAE solar batteries meet all requirements of modern renewable energy applications with a very wide range of sizes and different lead acid technologies. Therefore BAE solar batteries have been approved for a wide range of industrial energy systems, even under extreme conditions, as well as in private households, e.g. to increase the content of self-consumed solar energy to a maximum level.

BAE offers for renewable energy applications extreme low maintenance VLA batteries with liquid electrolyte and maintenance free batteries in progressive VRLA-GEL technology with fixed electrolyte. Due to the high cyclic requirements BAE solar batteries with positive tubular plates are the exclusive solution for high life time performance. Reliability, a superior life-time and excellent deep discharge capabilities are the hallmarks of our batteries. Based on the outstanding characteristics of the single batteries compact and powerful tailor-made solutions are available like the SUNDEPOT for residential applications.

BAE SECURA SOLAR batteries reflect outstanding quality by:

- Highest cycle performance approved acc. to IEC 61427 supported by outstanding tubular electrode quality
- Excellent charge acceptance with high efficiency improved by carbon black additives
- Best deep discharge capability design with microporous leaf separator
- Perfect reliability and lowest cleaning and reduced maintenance effort to minimum due to absolute tight pole bushing in BAE Panzerpol design
- Unique external inter-cell connector design for all solar block batteries secures best energy transfer and provides single cell monitoring
- Safe and long term proven technology
- Well-established and cost neutral recycling circuit

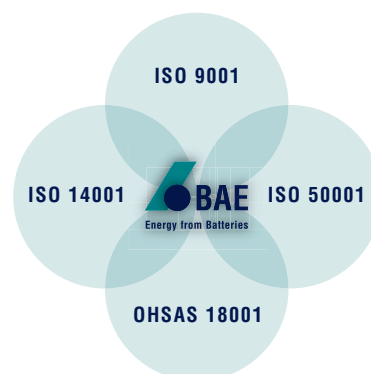
## Short Profile

Since 1899 BAE stands synonym for quality and reliability in the market for industrial lead-acid batteries. The core business of BAE is the production of stationary batteries, especially wherever electricity needs to flow uninterrupted like in the emergency power supply for data centers, electrical power supply facilities and telecommunication infrastructure. Since many years BAE also operates in the market for renewable energy and provides solutions for a reliable and environmental-friendly electrical power supply. Moreover BAE produces batteries for motive power and railway applications. Nowadays we are an independent medium-sized company with a well-established position in the international battery market. BAE excels in its customer orientation and quality is our hallmark. A highly flexible and process-orientated structure enables us to provide our customers with tailor-made solutions.



## Quality

As a well-recognized manufacturer for premium industrial batteries BAE is aware of its responsibilities to customers, its employees, society and environment. The commitment to quality and the fulfilment of the highest environmental standards, which are embedded in our company standards, have led to a certification according to the quality management standard ISO 9001 in 1995 and to the environmental management standard ISO 14001 in 2004. The implementation of a management system for "Occupational Health- and Safety Assessment Series" (OHSAS 18001) in the year 2012 underlines our focus for continuous process improvements. BAE quality management pervades to all areas and the highest quality standards already apply to the selection and procurement of the components which are used in our products. During the different production steps the quality of the raw materials, the intermediate products and the actual production procedure will be checked consequently. Critical issues will be checked 100% to ensure that only products of highest quality level will be supplied to our customers.



## Environment

As a producer of high quality lead-acid batteries BAE is aware of its responsibilities towards society and environment. Efficient environmental measures prevent emissions and waste products are disposed and recycled directly where possible during the production process. Lead-acid batteries consist of lead, plastic parts and acid of which all components are almost to 100% recyclable. The used lead will be fully reused again as secondary lead and the plastic parts get removed before the process of lead recycling and are prepared for further using such as in the automobile industry. This whole certified and registered recycling process makes the lead-acid battery one of the most environmental friendly energy sources. Besides we established in 2013 an energy management system according to the ISO 50001 standard to improve all of our energy-related processes and prove our company's responsibility for the environment. Top quality and reliability are the core elements of the success of our products. Our aim is simple: "the chemistry must be right".

