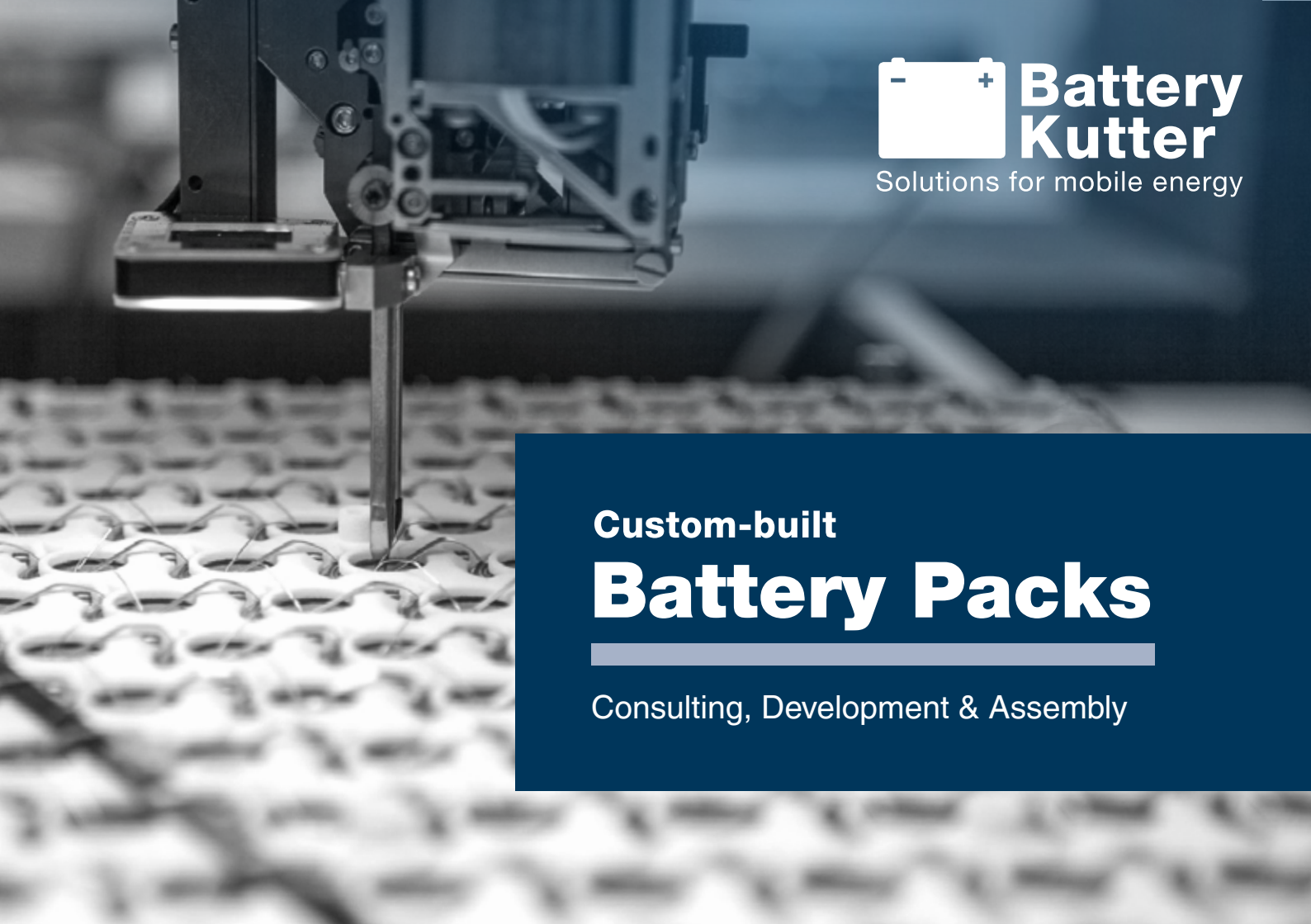


Battery Kutter

Solutions for mobile energy

Custom-built

Battery Packs

Consulting, Development & Assembly


Battery
Kutter
Solutions for mobile energy

Content

Working with us is simple...

because it's straightforward, professional and personal.
And most importantly:
We take care of your needs, **quickly, reliable and with tailor-made solutions.**

Key facts

Second generation
family business

30 years
experience in mobile energy

300
employees

40
engineers

EUR 70 m
revenue

Our EN ISO 9001 certified sister company Wamtechnik is one of the TOP 5 battery pack assemblers in Europe.

Three specialised knowledge centres

HAMBURG
Consulting, logistics and retail headquarters

WARSAW
Research, development and production site for custom-built battery packs

HONG KONG
Supplier coordination, quality gate ensures constant quality control in local factories, audit management

Global know-how

Our success is based on our experience and the know-how of our highly qualified employees. Having built on this expertise for 30 years, the sustainable development of our family business, which now operates in its second generation with locations in Hamburg, Warsaw and Hong Kong, bears testament to this.

As a highly competent partner for trade and industry, we offer you the most advanced battery and accumulator solutions.

Service overview

We develop customised Li-ion and nickel metal hydride-based battery packs for highly diverse markets and requirements, ranging from electronics to the most sophisticated design.

Our development department consists of a team of top-qualified engineers. In addition to our battery cell experts, we also employ:

- **Designers**
- **Hardware and software developers**
- **Test engineers and prototype technicians**
- **Welding technology specialists**
- **Specialists in thermal management, charging technology and many other innovative areas**

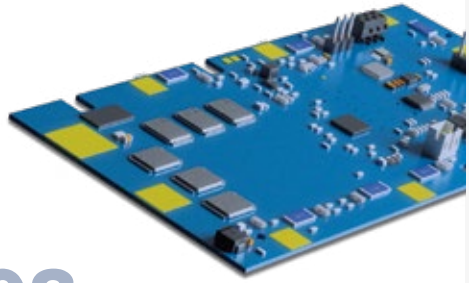
01

Custom-built batteries

Take advantage of our 30 years experience in the development of custom made rechargeable battery packs. We prioritise not only the careful selection of cells suitable for your application but also the adaptation of modern surveillance and security electronics with the appropriate charging technology. We are looking forward to finding a custom-made solution together with you.

02
System solutions

Extensive experience in charging technology, motors and controllers enables us to use our know-how throughout the entire development of your battery pack. We are capable of optimising a complete system with you, in terms of electromechanics or design, and to bring it to mass production stage.



03
Battery Management Systems (BMS)

In our BMS, you'll find the evolution of the classic protection circuit. In addition to the standard functions of protection circuitry, a BMS provides more relevant data, such as the current charge state, temperature, number of charge cycles and other information for further processing. This data can be read via a SM, I²C or CAN bus. We will set up the BMS specifically for your application.

04
Chargers

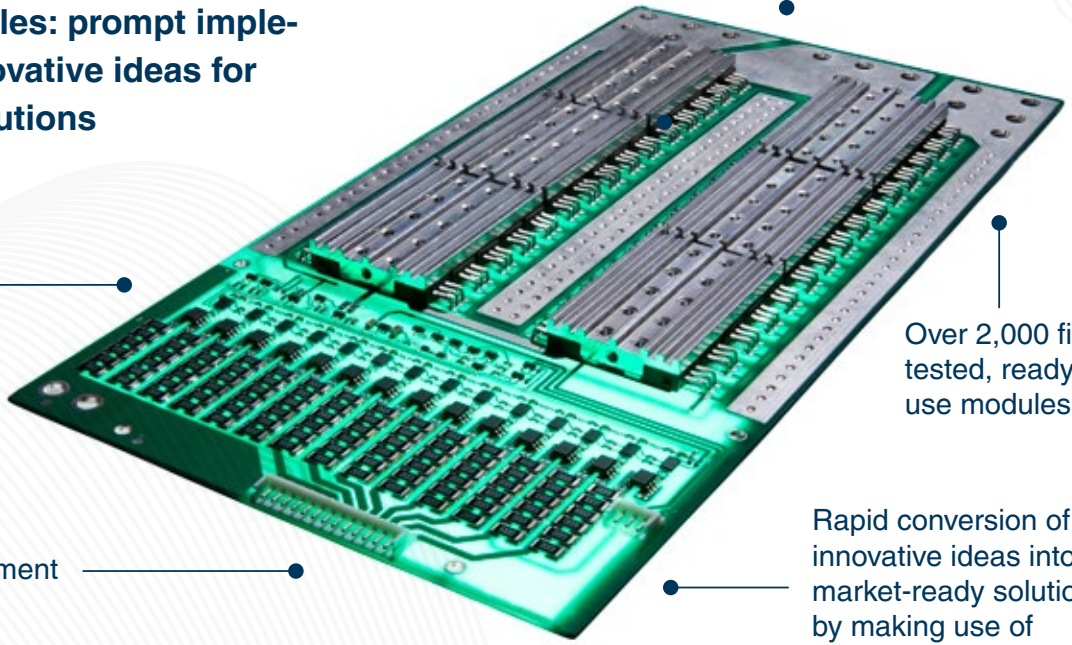
Professional battery chargers with the right specifications for your application are essential for optimal use of the capacity and long battery life. Our product range includes high-quality manufacturers, who will, depending on the project, also develop custom-made types for you.

Optimum time-to-market

Development cycles: prompt implementation of innovative ideas for market-ready solutions

We cover everything: mechanics, electronics, software & injection moulding

Development of state-of-the-art battery packs and fast certification

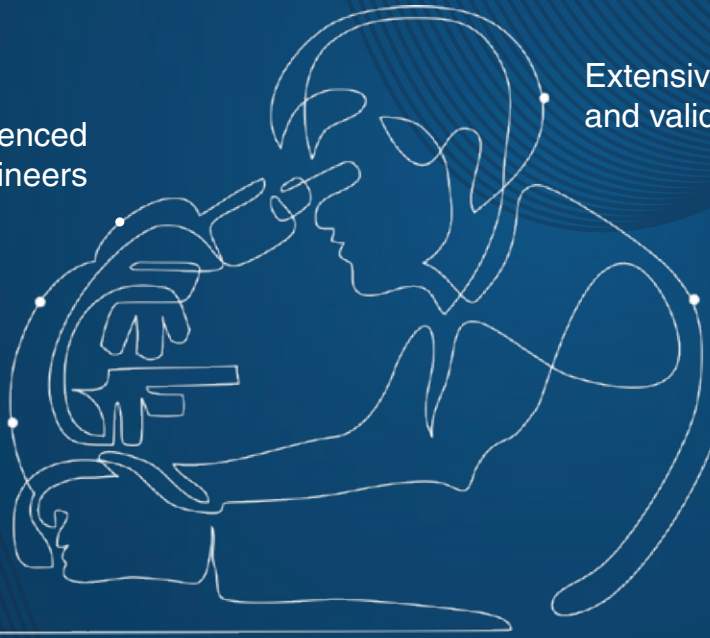


Over 2,000 field-tested, ready-to-use modules

Programming of Battery Management Systems

Rapid conversion of innovative ideas into market-ready solutions by making use of existing boards

Innovative research and development



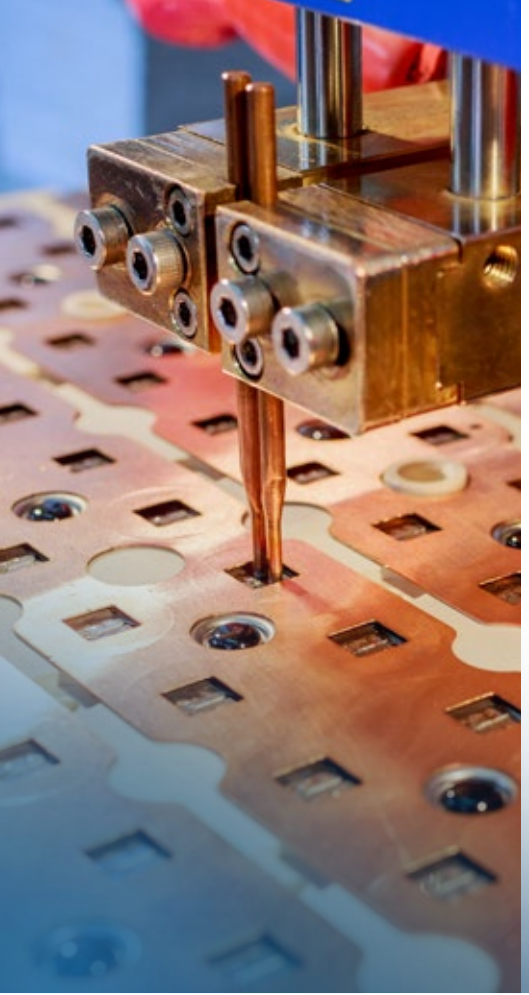
40 experienced engineers

In-house testing and certification laboratory

UN certifications are carried out in-house

Extensive tests and validations

Huge research partner network



Battery Kutter
Solutions for mobile energy

Automation

The automation of the production processes of lithium-ion batteries offers greater productivity, higher process reliability and cost optimisation. The cells for the batteries are pre-tested on the production line. The welding and automatic potting steps run automatically thanks to the use of the welding robot at Wamtechnik. The potting system ensures increasing productivity.

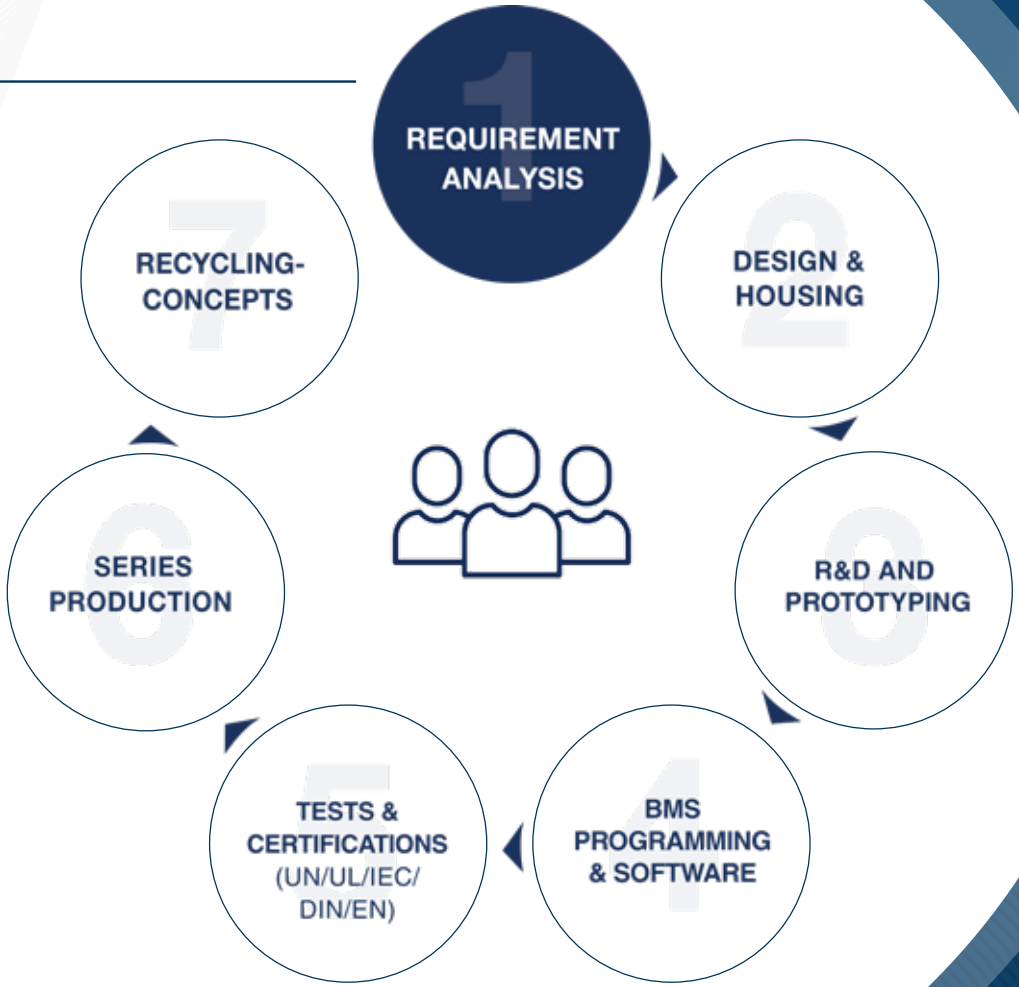
In addition to the intermediate quality tests, Wamtechnik has high-quality end-of-line testers for final quality assurance.

The degree of automation depends on the individual project size.

Project phases

We create dedicated solutions and support our clients at every stage of the project. Quality and close cooperation is very important to us.

That is why we stay in close contact with you throughout the project process and inform you about all relevant stages.


1
REQUIREMENT ANALYSIS
2
DESIGN & HOUSING
3
R&D AND PROTOTYPING
4
BMS PROGRAMMING & SOFTWARE
5
TESTS & CERTIFICATIONS (UN/UL/IEC/ DIN/EN)
6
SERIES PRODUCTION
7
RECYCLING-CONCEPTS

1 Requirement analysis

We analyse your technical requirements and find the solution that best meets your demands: We determine the parameters required for your battery pack: electrical (e.g. voltage, capacity, resistance, operating and charging currents), mechanical (e.g. size, weight, mechanical stresses) and electronic (e.g. related to the electronic monitoring system).

2 Design & housing

Our experienced engineers assist you with the latest CAD software to ensure your demands are fully met.

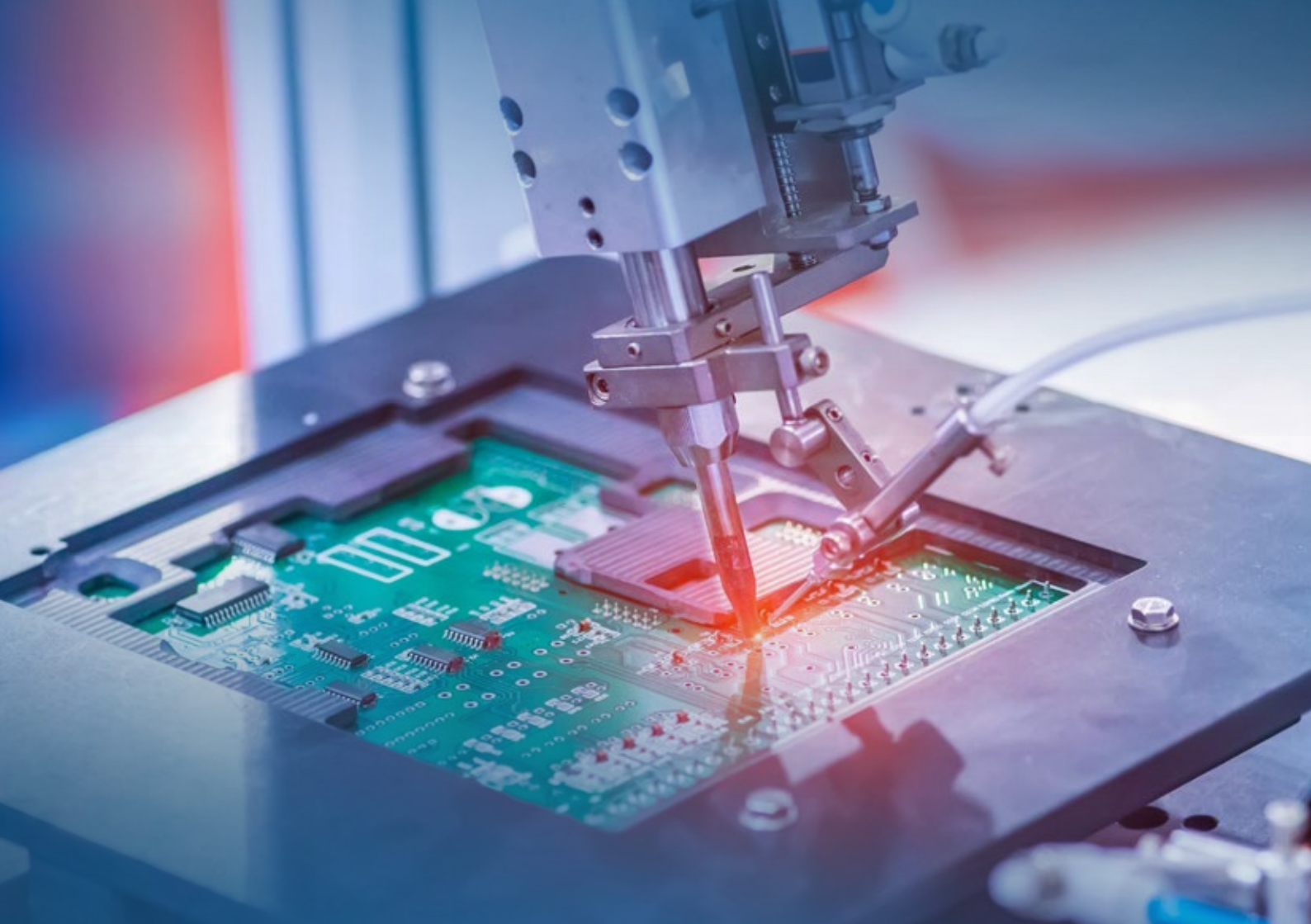
3 Research and development / prototyping

The R&D department designs systems and their components and software in accordance with UN-38.3, IEC 62133, UL 2054, UL 2595, UL 2271, UL 1998, UL 991, ISO 26262, EN 50604 and EN 15194 standards. We always take into account the application and specific requirements for the specific market to ensure the products' functional safety.

Prototyping: At this stage, the first design is built using 3D printing before undergoing further examinations and necessary tests. The structural build of the packs is checked during the development phase. For example, we conduct pretests (shake and collision tests) for UN-38.3 certification. During this phase, we can still adapt or amend details to achieve the desired product features. The aim is to create a pack that's as close to production as possible in order to test and validate its characteristics and functionality.

4 BMS programming

Highly advanced products using the Li-Ion technology are always equipped with a multistage electronic Battery Management System (BMS) to ensure complete safety of the system. BMS measures all parameters of the cells and, where necessary, disconnects the circuit and conducts cell charge balancing, which significantly increases the efficiency and extends the life of the power source.



5 Tests & certifications

We conduct tests, frequently using the final application, to verify the durability of the pack (tests in accordance with the client's load profile, cycle and climatic tests). The tests also include a thorough analysis of technical requirements for the device and a detailed assessment of the materials, methods and technologies used in the pack. We conduct several tests at our own laboratory, while UN certification is also carried out in-house.

Thanks to our external independent partners, we also assist our clients with safety and transport certification – an important factor, in particular for international markets. This includes EMC tests as part of the EU declaration of conformity as well as IEC and UL test reports.

6 Series production

After successful tests, we initiate batch production. We use the Lean Manufacturing Method to ensure efficient use of human and material resources and optimise manufacturing costs.

We pay special attention to the following factors:

- high quality and stability of cell parameters
- correct sizing of cells before assembly (in terms of voltage, capacity and resistance)
- high-quality cell connections to ensure long life of the pack (from 300 to several thousand charge/discharge cycles)
- using professionally manufactured components designed by Battery-Kutter

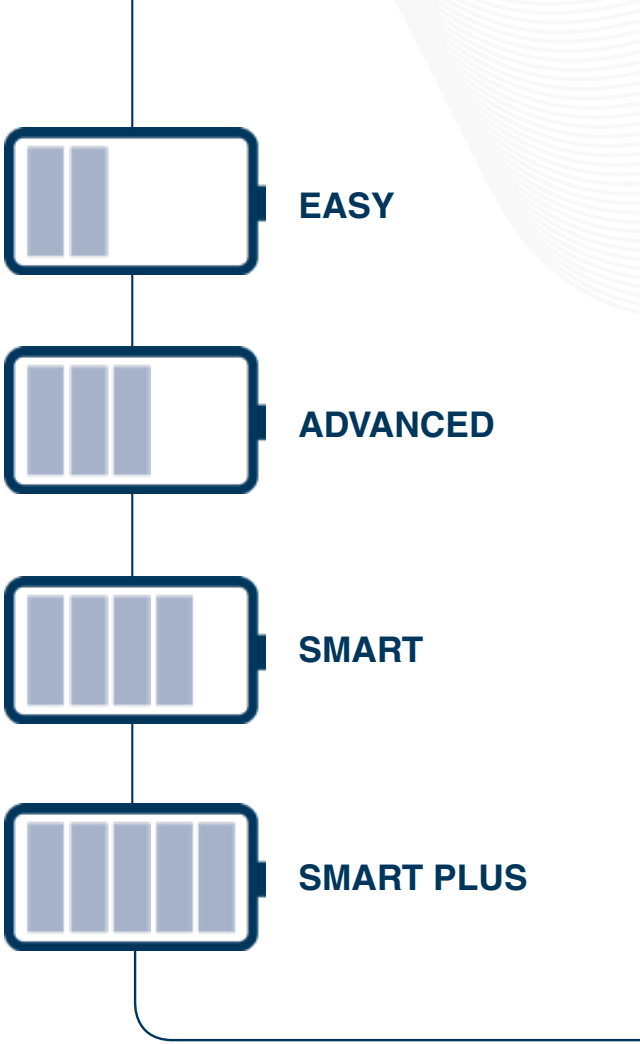
7 Recycling concepts

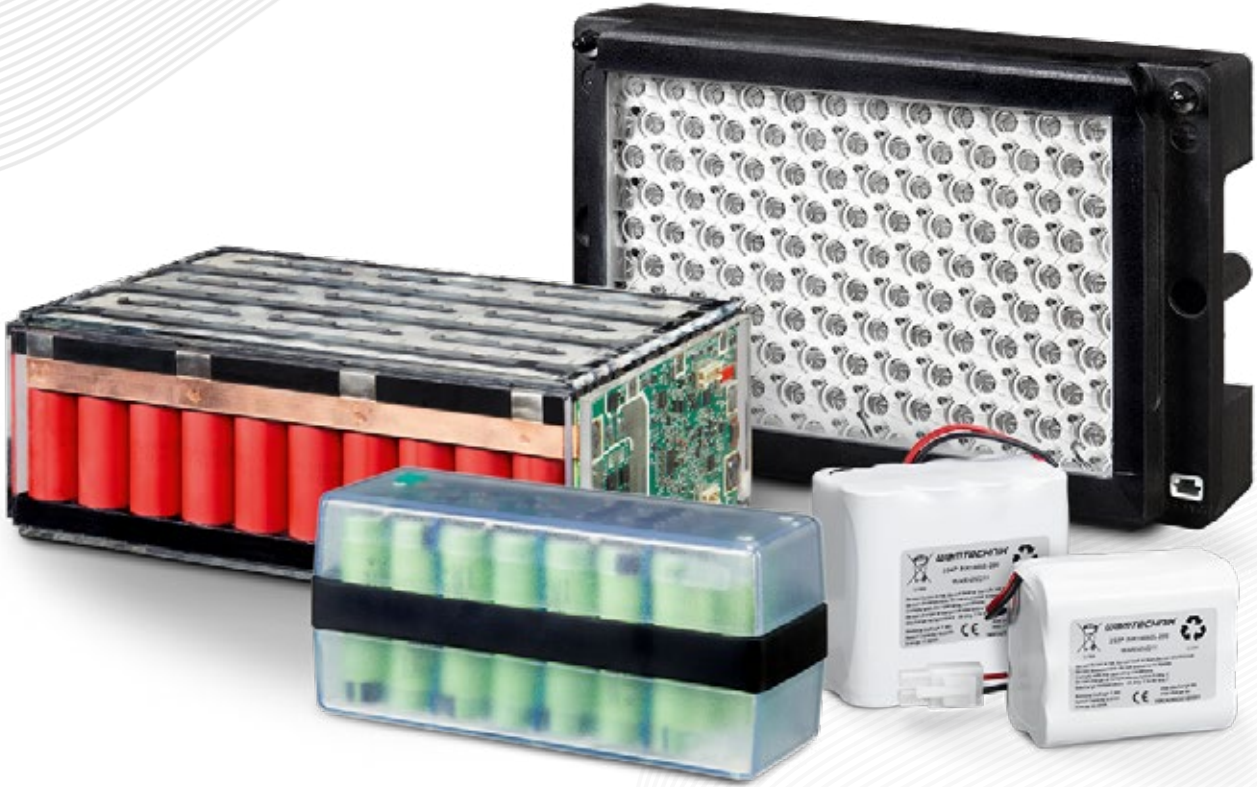
At Battery-Kutter, we are conscious of our responsibility when it comes to substances that might be harmful to the environment. Therefore, the safe disposal of batteries is an important aspect of our work. In order to spread awareness and simplify the disposal process, we provide a cost-free battery disposal service for our customers.

WAM Power Packs

Every battery pack we produce is customised and individually manufactured for you.

For a good overview of our range of products, we have segmented our WAM Power Packs into 4 Families, according to their functionality and the smartness of our BMS.





EASY

WAM Power Pack Easy

The WAM Power Pack Easy is based on a standard BMS and will be adapted to the customer's requirements.

Specifications

PCM protection circuitry	1S1P – 4S4P 3.65 V – 14.6 V
9.74 Wh – 500 Wh 0.5 A – 10 A	UN-38.3
Optional IEC 62133 / UL 2054	

Track/Scan/RFID

Backup Systems

Medical Technology

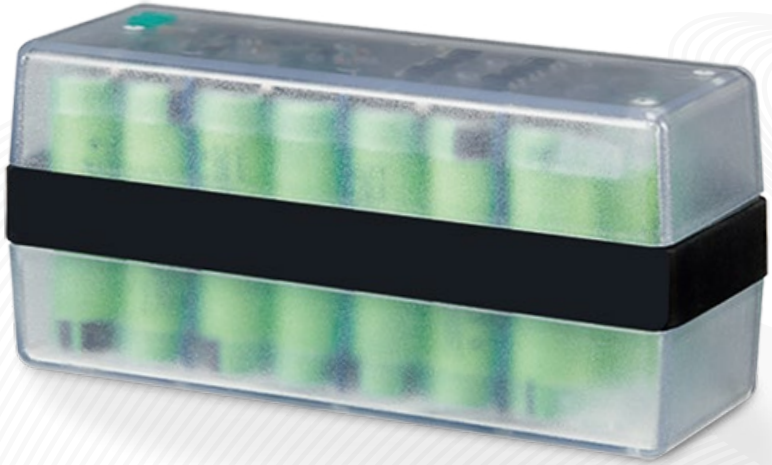
Specifications

Latest BMS controller	Highest safety level
Basic data communication	Different BQ options
1S1P – 7S40P 3.7 V – 26.6 V	50 Wh – 3,000 Wh 2 A – 100 A
UN-38.3	Optional IEC 62133 / UL 2054

WAM Power Pack Advanced

Starting with the WAM Power Pack Advanced, we offer you a function with charge level display and communication, giving you the possibility to read out data (charging interface).

ADVANCED

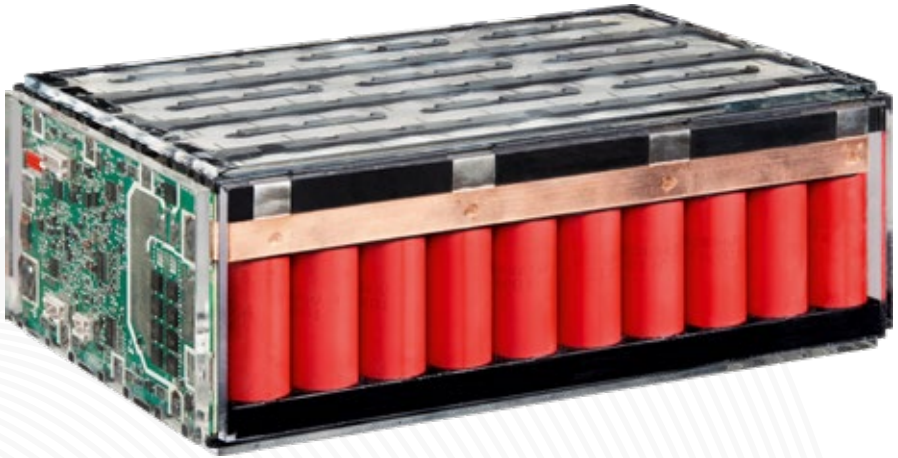


Warehouse Logistics | Robotics | Mobile Workplaces | E-Bikes

SMART

WAM Power Pack Smart

The WAM Power Pack Smart enables data exchange and offers the option to connect modular packs.



Specifications

Microcontroller-LAPIS-based	Open CAN BUS communication
7S1P – 14S40P 25.2 V – 53.2 V	0.5 kWh – 10 kWh 30 A – 300 A
UN-38.3	Optional IEC 62133 / UL 2054

Medical Technology | Robotics | Mobile Workplaces | E-Bikes | Power Tools

Specifications

Software-based master-slave modules	Open CAN BUS communication
Automotive standard	14S1P – 168S40P 50.4 V – 638 V
1.75 kWh – 450 kWh 100 A – 1,000 A	UN-38.3
Optional IEC 62133 / UL 2054	

WAM Power Pack Smart Plus

The WAM Power Pack Smart Plus is also modular but in a software-based master-slave system.

SMART PLUS

E-Mobilty | Construction Machinery | Industrial Trucks | E-Motorbikes | E-Motorboats

Diverse industries & areas of application

- E-mobility
- Medical technology
- Warehouse logistics
- Robotics
- Tracking, scanning, RFID
- Mobile workstations
- Power tools
- Energy storage

..., and many more


Robotics


Tracking, scanning, RFID


Mobile workstations


Power tools


Energy storage

Battery Kutter

Solutions for mobile energy

Battery-Kutter

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VdS · ISO 9001