



## Performance-boosting battery systems

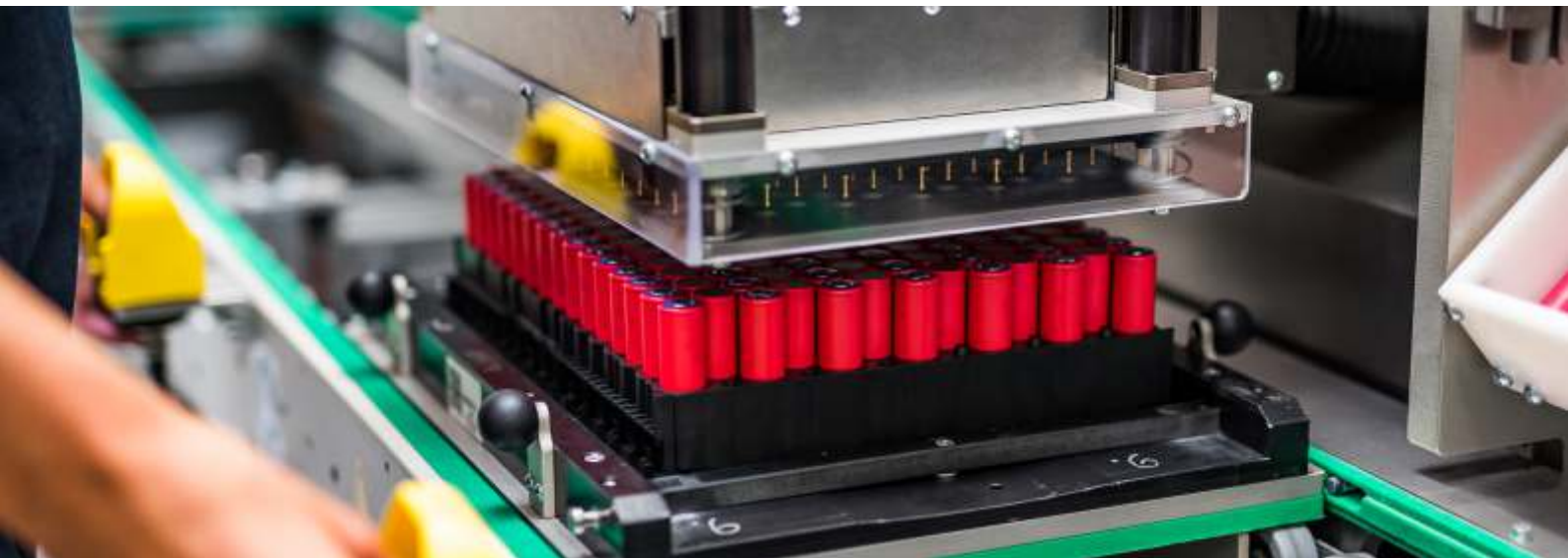
Li-ion solutions for industrial  
cleaning machines

# Advanced Battery Systems

The leader in manufacturing li-ion battery systems

We are a leading manufacturer of advanced battery systems, using our 25+ years of experience in design and production of battery systems to consistently deliver for our various high-profile customers. We specialise in lithium-ion batteries, producing a variety of systems with varying power and capacity. Our solutions for cleaning machines are effective and innovative.

Our li-ion batteries all offer continuous operation, high performance, fast charging, exceptional safety, and optimal cost. They've consistently shown themselves to be fantastic replacements for wet batteries, which are often used in cleaning machines and have several drawbacks, including low efficiency, high maintenance requirements, and short run time.



Over 25 years of experience in battery design and production.



Internal and external alternative cell tests to expedite time to market and promote savings.



In-house laboratories for efficient and cost-effective testing – including UN 38.3 – and R&D tests.



Rapid and agile prototyping to ensure brief compliance and enhanced speed to market.



Battery design and manufacture to meet the requirements of all external certifications.



Easily scalable production lines to facilitate speedy manufacture of products regardless of order size.



Produced in Europe with easy access to high-quality components.



Knowledgeable and highly trained engineers involved in all aspects of design and production, to ensure superb service and exceptional products.

# Innovation through expertise

## Battery systems tailored to all requirements

We support our customers through every stage of the journey, including design, testing, and production. We manufacture over 2.7 million batteries annually, made possible by our efficient and economical production processes, which include manual, semi-automated, and fully automated production lines.

Our complete engineering solutions offer high quality, flexible production capabilities and are highly cost-effective, plus we guarantee support through your project's life cycle. We continuously invest in innovation and our manufacturing capabilities, ensuring we consistently design and manufacture products of the highest quality for our customers.

## Validation & Testing

We provide a thorough testing service in our modern and well-equipped testing laboratory, where we carry out periodic quality assurance testing for complex products. Tests we regularly carry out include:



UN 38.3 transport tests



Drop test



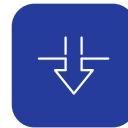
Environmental IP tests



Periodic tests



Mechanical tests



Nail penetration tests



Cell tests



## When you work alongside us, we will:

- effectively optimise battery packs for a more efficient assembly process,
- design complete battery systems focused on high performance and quality,
- source components for battery cells and other associated items,
- create in-house prototypes at every stage of your project,
- perform complex laboratory testing to ensure optimal performance,
- deliver cost-effective production lines and assembly processes,
- tackle all chemistry challenges to select the cells best suited to your needs.



# Battery systems for enhanced efficiency

## Battery systems to meet the high demands of industrial cleaning machines

Our batteries undergo strict testing to ensure they operate optimally in industrial cleaning machines for flat surfaces. This testing is carried out internally in EMBS's modern laboratories, as well as externally, in collaboration with industry experts.

We know the industrial cleaning industry is a demanding one, requiring reliable and efficient battery systems – something we specialise in at EMBS.

### The benefits of using li-ion batteries for cleaning machines include:

- **Zero maintenance:** Unlike lead-acid batteries, li-ion batteries do not require water re-filling, equalisation charging, or their SoC/DoD levels monitoring. This not only saves time and money, but also reduces the risk of accidents or spills.
- **Exceptional value:** Li-ion batteries offer fantastic return on investment, as running costs are drastically reduced and downtime is lessened, all while enhancing performance.
- **Long battery life:** Li-ion batteries can have a cycle life of over 2,000 charge cycles – lead-acid batteries only typically offer 500 cycles. Li-ion batteries also have less capacity degradation over time and offer consistent output for several years.
- **Safer facilities:** Lead-acid batteries can generate hydrogen when charging, which can be combustible when mixed with oxygen. Li-ion batteries do not produce any harmful gases during charging.
- **Higher productivity:** Li-ion batteries allow for fast charging, opportunity charging, and longer runtimes. This ensures continual operation without downtime or frequent battery swapping. Operations are also simplified, as the need for dedicated areas for long charging processes is eliminated.



# Universal 24V battery system

Designed to ensure exceptional performance, this battery offers high capacity and a modular system to enhance performance. This battery is built with three major considerations in mind: safety, design, and performance. It can usually be used as a maintenance-free replacement for standard lead-acid batteries.



## Key features



### Easy replacement

Maintenance free battery that's the perfect replacement for old lead-acid batteries, plus also offers significantly improved performance.



### Modular design

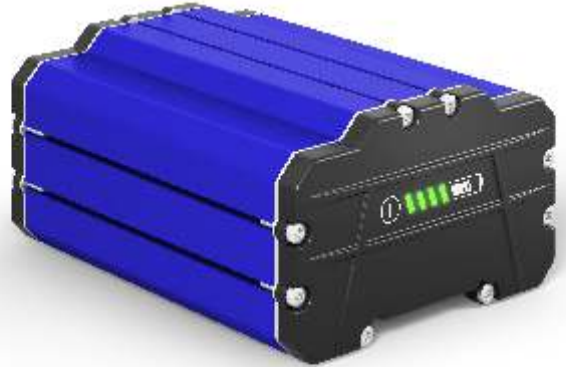
Modular design allows two batteries to be connected in parallel, ensuring simpler production and greater adaptability.

## Technical specifications

Parameters	Standard
Voltage (nominal)	<b>21.8 V</b>
Capacity (nom.)	<b>49 Ah</b>
Energy (nom.)	<b>1067 Wh</b>
Max constant discharge current	<b>20 A</b>
Charging current (nom.)	<b>16.5 A</b>
Discharge temperature range	<b>-5 to 60°C</b>
Charging temperature range	<b>0 to 45°C</b>
Tightness degree	<b>IP 20</b>
Dimensions (L x W x H)	<b>177 x 140 x 170 mm</b>
Mass	<b>~ 7 kg</b>
Certification	<b>CE, UN 38.8</b>

# Universal 36V battery system

Universal battery for industrial cleaning. Modern NMC 21700 cells ensure a long service life and high energy density. The solid construction, including aluminium housing, ensures durability and high resistance to mechanical damage. An advanced battery management system (BMS) is used to protect your application.



## Key features



### Advanced BMS

The advanced battery management system (BMS) provides solid electronic protection, ensuring error-free application usage.



### Thermal management

The unique outer design and increased cell contact surface help dissipate heat, boosting the battery's performance.

## Technical specifications

Parameters	Standard
Voltage (nominal)	36 V
Capacity (nom.)	14.7 Ah
Energy (nom.)	534 Wh
Discharge current (nom.)	≤14 A
Charging current (nom.)	7 A
Discharge temperature range	-5 to 60°C
Charging temperature range	0 to 45°C
Tightness degree	IP 54
Dimensions (L x W x H)	187 x 140 x 85 mm
Mass	~ 3.3 kg
Certification	CE, UN 38.3
Communication	UART, CAN (optional)

# Universal LFP 48V battery system

Coming soon: the LFP 48V battery system. It combines technological excellence, perfect design, and a long lifecycle, plus offers high capacity and a modular design. This battery system has been designed from scratch and can be tailored to customer requirements without necessarily requiring certification.



## Key features



### Superb performance

Modern LFP cells offer an excellent lifecycle, plus provide extra safety and high energy density.



### Plug&Play

Universal Plug&Play system with single or multiple batteries, providing exceptional convenience and high performance.

## Technical specifications

Parameters	Standard
Voltage (nominal)	48 V
Capacity (nom.)	30 Ah
Energy (nom.)	1440 Wh
Discharge current (nom.)	40-60 A*
Charging current (nom.)	15 A
Discharge temperature range	-20 to 60°C
Charging temperature range	0 to 55°C
Tightness degree	IP X4
Dimensions (L x W x H)	490 x 170 x 135 mm
Mass	~ 12 kg
Certification	CE, UN 38.3
Communication	CAN

\* Max continues discharge current and max peak discharge current will be verified with end application and environmental conditions.



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Providing enhanced performance via  
advanced battery systems solutions

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