WAVETECH

BEAT®

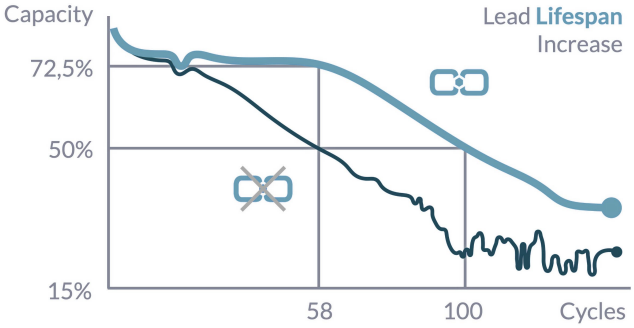
Double Battery Service Life and
Triple Energy Throughput

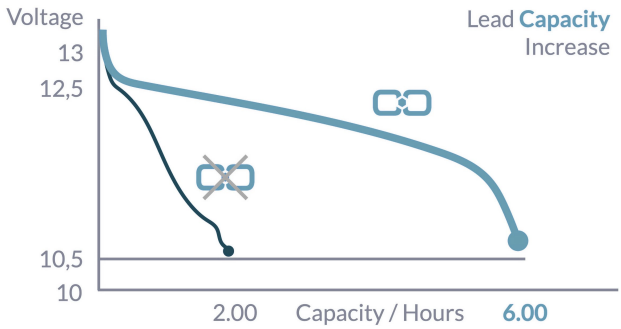
Increase Energy Efficiency and Battery Performance

Overview

The BEAT® device, using WaveTech's Crystal Control Technology, mitigates battery aging by optimizing the charging process by specially modulated voltage pulses added to the regular charge voltage. These pulses deliver additional mechanical energy to the ions in the electrolyte, enhancing their mobility and diffusion within the pores of the active materials. This process creates localized overvoltages in the active materials, which influence the crystal dissolution and growth. By operating at both the microlevel (affecting crystals) and macro level (influencing cell power), BEAT® offers a holistic approach to battery performance and care.

Key Benefits





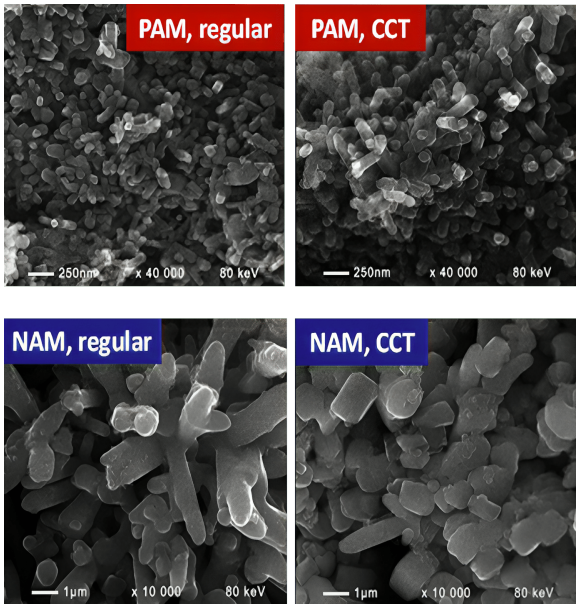
Maximized Battery Performance and Cost Savings

Deliver up to double battery lifespan and up to three times more energy throughput, preserving capacity. This treatment significantly lowers the cost per kWh by up to 67%. Even under severe ambient conditions, BEAT® has been proven to slow the battery aging process, maintaining effective capacity, and extending lifespan.

Optimized Charging and Enhanced Power Performance at Various Temperatures

Enhanced charge acceptance that enables faster recharge, saving time while also ensuring reliable performance during low-temperature charging. BEAT® renders batteries less sensitive to extreme temperatures with improved stability under conditions ranging from -20°C to +50°C.

(PAM, Regular) = Positive Active Material without BEAT
(PAM, CCT) = Positive Active Material with BEAT



(NAM, Regular) = Negative Active Material without BEAT
(NAM, CCT) = Negative Active Material with BEAT

How it Works

BEAT® was developed on deep understanding of battery electrochemistry. The specially modulated voltage applied from outside the battery, deliver additional energy to the ions within the battery. Connected easily to the terminals of a 12V battery (either a single monobloc or a group of cells), it can operate individually or together with multiple BEAT® devices to treat a string of batteries. It is suitable for use with both new and older batteries. The BEAT® is is compatible with existing chargers, testers, battery monitoring and management systems.

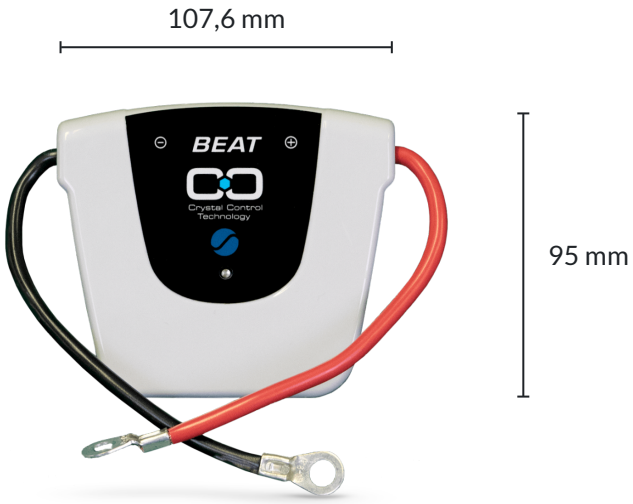
Microlevel Impact
By electrodynamically altering the mobility of ions, BEAT® changes the local ionic concentration within the pores of the active materials. This affects the local crystal growth conditions, which in turn have control over the battery's capacity bearing reactions (charge and discharge).

Cell Level Impact
Beyond the microlevel, BEAT® has a broad influence on the overall cell functions. It enhances the ionic transport between the plates and within the pores, which affects various battery processes such as formation, charge, discharge, electrolyte stratification, and can help for cell equalization, and capacity recovery.

The useful life of a battery is closely tied to its operating conditions.
Factors such as temperature, charge and discharge profiles, directly play crucial a role in determining the expected battery lifespan.

Key Features	Benefits
Healthier Batteries	
Slow down the battery capacity loss rate	Provide up to 50% savings from battery purchase and replacement
Faster and Efficient Charging	
Optimize the properties in the active materials of the battery	Charge 50% faster without additional heat or gas evolution
Optimized String Performance	
Balance voltages of batteries in series and protect during extreme operating conditions	Minimize disparities of battery-to-battery within a string, and reduce failure rates
Easy Use	
A “Plug-and-play” design that ensures fast and easy installation	Low cost deployment with minimum human error risk
Reduced Carbon Footprint	
Reduce costs for preliminary battery replacement and purchasing of new batteries.	Reduce overall carbon footprint

Technical Specifications



Main	
V_{BATT} nominal	12V
V_{BATT} maximal	18V
Operating Voltages	≥ 10.5V when rising
	≥ 13.3V constant
Connectivity	Terminal M8 (Φ 8,4mm)

Physical	
Dimensions (W/L/H) in mm.	107,6/95/18
Net Weight	270g.
Colour	Grey
Material Housing	ABS

Conformance	
Product Compliance	ANSI C63.4
	IEC 61000-4-2, IEC 61000-4-3, IEC61000-4-4, IEC 61000-4-5, IEC61000-4-6
	EN 55022:2010, EN 55024:2010 + A1:2015

Environmental	
Operating temperature in °C	0 – 65
Storage temperature in °C	-40 - +85
Conditions	Indoor use

Warranty
As per contractual terms*