

**LEAD**  
**CRYSTAL<sup>®</sup>**  
BATTERIES

POWERED BY

**Betta Batteries**

**LEAD  
CRYSTAL®**  
BATTERIES

# THE POWER OF **TOMORROW**

Clean energy defines the world that we live in today and tomorrow. Lead Crystal® technology creates power that is cleaner, safe and long-lasting for a better future.

To overcome the fundamental flaws of lead-acid, gel and AGM batteries, such as plate sulfation, active material loss, high water loss rate, serious acid pollution, poor low temperature performance, short life cycle, poor transport safety, Betta Batteries successfully developed Lead Crystal® batteries. Lead Crystal Batteries have a unique proprietary technology; five exclusive patented technological innovations.

Betta Batteries commercializes Lead Crystal® batteries, the better alternative to lead acid, lead gel and AGM batteries. We are the only manufacturers of Lead Crystal® batteries worldwide.

## **LEAD CRYSTAL® BATTERIES CHARACTERISTICS IN A NUTSHELL:**

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### **PERFORMANCE**

Robust, resilient, high performing. Lead Crystal® batteries can be discharged deeper, cycled more often (even in extreme temperatures) and have a longer service life. They recover to full rated capacity over and over again.

### **TECHNOLOGY**

A unique micro-porous high absorbent mat (AGM), pure lead plates, safe SiO<sub>2</sub> electrolyte solution that solidifies into a white crystalline powder when charged/discharged.

### **CLEANER & SAFE**

Less acid, no cadmium, no antimony. Lead Crystal® batteries are up to 99% recyclable and are classified as non-hazardous goods for transport.

### **MARKETS**

Lead Crystal® batteries are being used in telecoms, UPS, petrochem/marine, defence, renewable energy, health care, manufacturing, transportation and electric motion (wheelchairs, golf carts and trolleys).

# WHAT MAKES LEAD CRYSTAL® STAND OUT

	LEAD ACID	LEAD GEL	LEAD CRYSTAL®	LITHIUM
TEMPERATURE	-18°C - +45°C	-18°C - +50°C	-40°C - +65°C	-20°C - +65°C
USAGE LIFE	2-3 years	3-4 years	8 - 12 years	5-6 years
ENVIRONMENTAL IMPACT	harmful	harmful	friendly	friendlier
TRANSPORT SAFETY	poor	average	very good	very poor
HANDLING SAFETY	average	good	very good	average
80% DISCHARGE CYCLE	350	400	1400	1000
HIGH CURRENT DISCHARGE ABILITY	poor	poor	very good	average
PERFORMANCE	average	average	very good	good
RECYCLABILITY	good	good	very good	poor
SIZE	average	average	average	small
PRICE	lowest	low	low - med	5-6x higher than gel
COST PER CYCLE	average	average	low	high

Best Performer

## HIGH QUALITY LEAD PLATES (99.97% PURE LEAD)

The positive and negative plates are the core electrochemical reaction area and the most important components of the battery

- No cadmium and no antimony

## AGM-LIKE PARTITION MATERIAL

Made from ultra-fine glass fiber separator of high porosity, using cathode absorption

## UNIQUE ELECTROLYTE

- A unique complex technology is used to synergize a range of inorganic salts and organic substances, thereby optimizing the reaction between the electrolyte and the active electrode material. This reaction also improves product safety, making it less harmful to installers and other users
- Less Sulphuric acid (<5%)
- When charged / discharged the liquid electrolyte transforms into a crystalized state leaving hardly any liquid electrolyte. This opens a wide range of installation applications, since the risk of electrolyte leakage is minimized

# LEAD CRYSTAL<sup>®</sup> CHARAC TERISTICS



## **LONG BATTERY LIFE**

Design life is 18 years. Up to 6000 charge/discharge cycles (20% DOD).



**LONG SHELF LIFE** Can be stored two years without a need for refresh charging. Simplifies logistics.



## **BETTER USAGE PERFORMANCE**

Charges up to two times faster than conventional alternatives. Excellent high-current discharge ability.



**FULL RECOVERY** Can be 100% discharged and then restored to full rated capacity daily.



## **GUARANTEED QUALITY**

Each battery comes with a standard three-year factory warranty.



Up to 99% **RECYCLABLE** and increased sustainability.



**CLEANER** Less acid, no cadmium or antimony. Complies with increasingly strict international standards on environmental protection.



**SAFER** No risk of leakage, fewer harmful chemicals, less fluids because of crystallization.



**EASY TRANSPORT** Classified as normal goods and non-hazardous for air, sea and land transport.



**EXTREME TEMPERATURE RESISTANCE** Operates at temperatures varying from -40°C to +65°C.

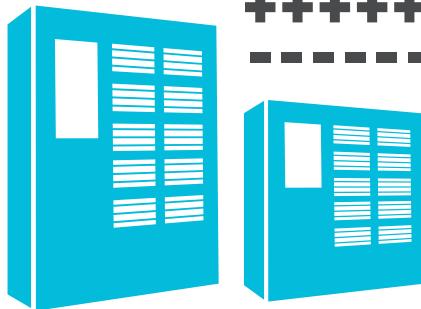
# PRODUCT RANGE & APPLICATIONS

## EXTENSIVE PRODUCT RANGE

Betta Batteries has an extensive range of 2V, 6V, 8V and 12V Lead Crystal® batteries suitable for multiple applications.

Betta batteries also offers a vast range of high performing light traction batteries used for electric/motive applications, such as golfcarts, wheelchairs, floor cleaners and other cleaning equipment.

## UPS

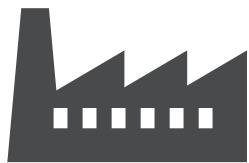
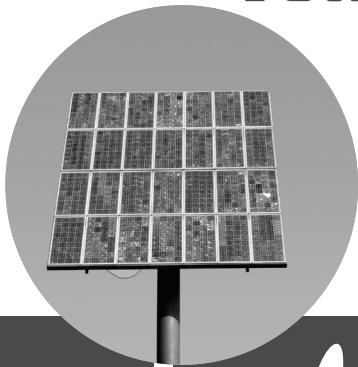


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## SOLAR POWER

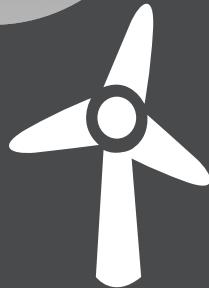
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## POWER STATION BACK-UP

## PLANT BACK-UP & LIGHT SYSTEM



## WIND POWER



## HOME SOLAR SYSTEM

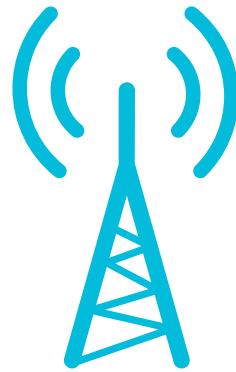


## RAILWAY SYSTEMS

## VERSATILE IN APPLICATION

Lead Crystal® batteries can be used in any application where lead acid, lead gel batteries or AGM Batteries are used today. Lead Crystal® batteries are also the preferred batteries in many applications where lithium is used today. The overview below is not exhaustive, please contact us if your application is not listed.

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## TELECOMMUNICATION MOBILE SWITCHING CENTERS & REPEATER TOWER BACK-UP SYSTEMS

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## FORK LIFT TRUCKS



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## ELECTRIC VEHICLES

++++++ FROM E-BIKE

TO

E-BUS



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## **BUSINESS MODEL**

Our unique and high quality Lead Crystal batteries represent our revolutionary vision to change the battery industry and create a more sustainable world and better future. For further information, please do not hesitate to contact us.

## **DIRECT BUSINESS**

Lead Crystal® batteries can be directly obtained for large corporate customers or OEM's worldwide. For all other customers interested in Lead Crystal® batteries, please contact one of our local authorized distributors.

## **DISTRIBUTION**

Betta Batteries works through a rapidly expanding network of authorized and dedicated distributors worldwide. Visit our website for a listing of our authorized distributors.

## **SALES & PRODUCT INFORMATION**

**WEB** [www.leadcrystalbatteries.com](http://www.leadcrystalbatteries.com)

**EMAIL** [info@bettabatteries.eu](mailto:info@bettabatteries.eu)



