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LEOCH BATTERY

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GOLF CART BATTERIES

- DT SERIES - FLOODED FLAT PLATE
- DTG SERIES - GEL FLAT PLATE
- DGF SERIES - TUBULAR FLOODED
- DGG SERIES - TUBULAR GEL

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COMPANY INTRODUCTION

Leoch International Technology Limited was founded in 1999, specializes in the research, development and manufacturing of the globally renowned LEOCH brand Reserve Power Batteries, SLI batteries and Motive Power Batteries. After years of innovation, LEOCH has become a diversified and leading manufacturer of lead-acid batteries in China. LEOCH enterprises consist of five China production factories located in Shenzhen, Dongguan, Jiangsu, Zhaoqing and Anhui. It covers an area of nearly 500,000 square meters, with 46 battery production lines and corresponding testing machines, 2 research and development centers in Zhaoqing and Jiangsu. Today, LEOCH has over 6,000 employees, more than 300 researchers and technicians worldwide. LEOCH has mainly produced the following types- AGM VRLA battery, GEL battery, Tubular plate batteries (OPzV, PzV, OPzS, PzS,PzB) , SLI battery, Motorcycle battery, Golf Cart battery, and Electric Vehicle batteries (EVs). These products are widely used by many different industries, such as telecommunication, power systems, radio and television systems, railway, solar, UPS, electric vehicles, automobile, golf carts, forklifts, emergency lights etc. The annual gross production volume exceeds 3.8 million KVAh.

With a highly qualified R&D team and unparalleled quality manufacturing standards, LEOCH continues to maintain its competitive edge in the industry. LEOCH has sales facilities in the United States, Europe and Southeast Asia, with more than 34 domestic and overseas sales offices. Its worldwide sales network already covers more than 100 countries and regions, and has a good cooperation partnership with several excellent external operators.

Jiangsu Factory

Zhaoqing Factory

Anhui Factory

Dongguan Factory

Shenzhen Factory

In an endless pursuit of perfection, Leoch International Technology Limited continues to blaze new trails in quality battery production. Leoch International Technology Limited has received many product quality recognitions such as the Global ISO, Europe's IEC and Germany's VdS certifications. Leoch is certified to / by ISO9001: 2000, ISO 14001, the National Battery & Telecommunications Ministries, as well as, the ministries of Power and Information. LEOCH Battery Products have also obtained the CE authentication of the European Union, UL recognition of the USA, PCT authentication of Russia, Kenya's national authentication, China Quality Escape Certificate, Certificate of Quality Inspection issued by the National Battery Quality Inspection Center, China Telecom, China Mobile, China Unicom, Certificate of National Broadcast and television Bureau, Certificate of China Ship's classification Organization etc. LEOCH has also received ISO/TS16949 certification, a requisite certification for supplying to the automobile and motorcycle industries. In essence, LEOCH has achieved many technical breakthroughs and received numerous national patents through its innovative research. Leoch International Technology Limited's mission statement and business model is to produce and sell the most reliable rechargeable batteries for all critical applications for the protection of people and assets while at the same time protecting the environment by maximizing the resource entrusted in our hand. Our reputation is built on the promise that ethical behavior and fair business practices will result in a satisfied and growing customer base. Leoch International Technology Limited prides itself by delivering its promises in a timely and efficient manner. We listen attentively to our customers, and are constantly reviewing our business practices and procedures in order to make changes that will further benefit all our customers.

GENERAL INFORMATION

Leoch golf cart battery can be used for all electrically powered industrial trucks, cleaning machines, lifting platforms, AGV systems. They are particularly indispensable in sensitive areas like hospital and food market. Due to improved resistance to low temperatures, Leoch golf cart battery is also superior to conventional lead-acid batteries in cold areas such as cold stores. Leoch golf cart battery have a long service life and more economical.

Throughout the worldwide, Leoch golf cart battery are regarded as the most environmentally friendly lead-acid battery system. With the selection of special alloys and other materials, consideration is given to the environment even at battery development stage. At the end of the battery's service life, the batteries can be collected and properly disposed. Lead and plastics are recycled and returned to the production process.

APPLICATION FOR GOLF BATTERIES

• Golf cart	• Electric Resort Car	• Marine	• Electric Utility Vehicle
• Electric Scooter	• Boat	• Solar	• Medical Application
• Electric Forklift	• RV	• Scraper	• Wheelchairs

CONVENTIONAL FLOODED BATTERIES

- Higher capacity and higher energy density.
- Longer service life.
- Excellent deep cycle property.
- Unique alloy and paste recipe for deep cycle application.
- Refilling plugs with special construction guarantee less water consumption.
- Special separator in nano grade.
- Advanced TTP welding and heat sealing technology.
- Terminals with high conductivity are very good at high current discharging.
- Containers and lids are impact resistant and made of polypropylene(PP).
- Wider operation temperature, safe and reliable.

VRLA-GEL BATTERIES

What is gel?

Gel is usually produced by homogeneous dispersion of pyrogenic silica in a diluted sulfuric acid. Pyrogenic silica is a powder of very fine dispersed SiO_2 which can absorb more than 10 times of its weight liquids, producing gel. Because of the thixotropic properties of gel (liquid by stirring and solid by resting), after a certain gelling time, the agglomerates are connecting themselves together to form a network which kept the liquid inside and gives the gel structure. This form can be again broken by stirring to single agglomerates giving again a liquid form.

MAIN DIFFERENCE FROM FLOODED BATTERIES

- Using gel SOL as electrolyte.
- Using the extra microporous separator which can: reduces the depolarization of the negative electrode and avoids the PCL.
- 3 effect (premature capacity loss due to negative plate sulphation); significantly decreases thermal runaway; during deep discharge or pole reversal, helps to prevent short circuits by dendrite growth between the plates.
- Plate thickness tolerance is not critical since the high compression of plate group assembly is not required.
- More electrolytes for better contact with plates and active materials and container walls, good for releasing internal heat and cooling battery temperature.
- Better vent valve design to lower gassing rate and water losing rate to extend battery lifetime.
- Maintenance free,not need check the height of electrolyte periodically and add distilled water.

ADVANTAGES OF TUBULAR GEL BATTERIES

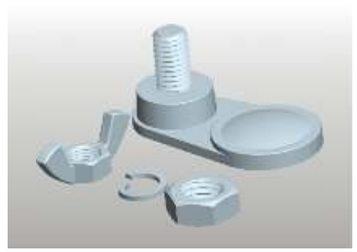
- No electrolyte adjustment needed.
- No periodical recharging is needed during storage because of low self discharge.
- Do not need quick recharging after discharging.
- Deep discharging resistance.
- No antimony poisoning by overcharging.
- Extremely low gas extrication during charging.
- High float-and cycle-life because of using gel and tubular plates.
- High energy at low temperatures.
- Can be stored and used in any position as there is no electrolyte spilling.
- The concept of gel can be used by tubular plates (AGM is not easy).
- No pollution problems if container is damaged.
- Approved for air Transport (IATA).
- No Acid stratification (segregation).
- No thermo-runaway-effect .
- Deep discharge properties are much less in case of gel than by AGM.

TERMINAL

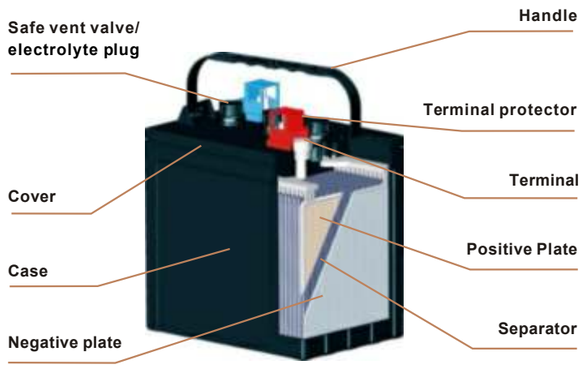
WNT

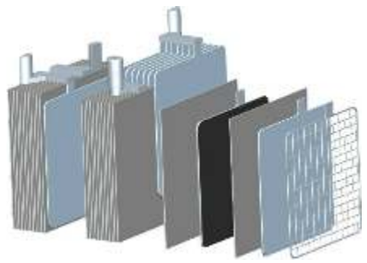
LPT-A

LPT

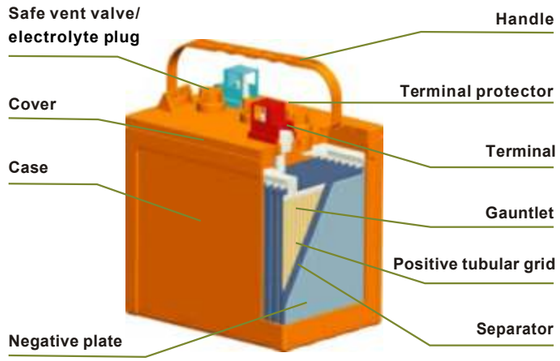


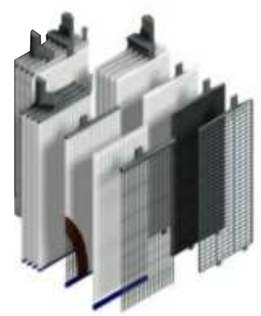
FLAT PLATE BATTERY CONSTRUCTION

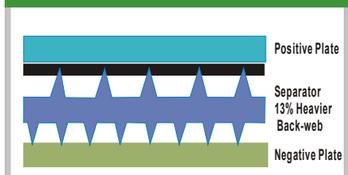
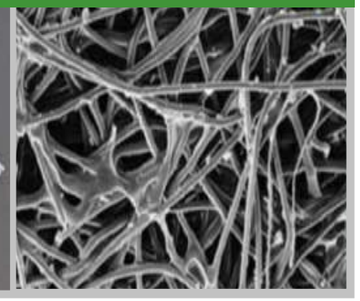




TUBULAR BATTERY CONSTRUCTION





SiO_2 PVC Separator	Nonwoven protective gauntlet	Micro Structure of gauntlet
 Deep cycle batteries feature the SiO_2-PVC Separator Advanced Design Separator. Benefits include extended life,sustained performance, less water consumption and lower maintenance costs		

FLOODED FLAT PLATE

DT SERIES

DT Series batteries are flooded flat plate battery, rechargeable lead-acid batteries which in contrast to conventional systems, retain the electrolyte is liquid.

GENERAL FEATURES

- Special plate design, long cycle life time.
- Using special Pb-Sb alloy to boost up the grid anti-corrosive performance and extend the battery using life time.
- Using special separator to boost up the battery performance inside.
- Reduce water losing rate and lower the possibility of thermal runaway. Better performance under critical ambient temperature condition.
- Little water losing,but need check the height of electrolyte periodically and add distilled water.
- Good deep discharge resilience performance.

SPECIFICATIONS

Type	Voltage (V)	Performance Averages after 15 Cycles				Terminal Type	Maximum Overall Dimensions[D] mm (inches)				Approx. Weight
		Ampere Hour Capacity(Ah)		Capacity [C] (Min)							
		20HR[A]	5HR[B]	@25Amps	@75Amps		L	W	H	TH	Kg(Lbs.)
DT606	6	210	175	380	105	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	27.6(60.8)
DT106	6	225	185	445	115	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	28.5 (62.8)
DT126	6	240	195	485	130	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	29.5 (65.0)
DT146	6	260	215	530	145	WNT ,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	30.4 (67.0)
DT866	8	150	125	225	E	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	30.6 (67.5)
DT876	8	170	145	295	F	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	31.6 (69.7)
DT896	8	190	155	340	G	WNT,LPT	260 (10 1/4)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	32.8 (72.2)
DT1275	12	150	120	280	H	WNT,LPT	328 (12 7/8)	180 (7 1/8)	247 (9 3/4)	289 (113/8)	40.5 (89.2)

A 20 hour rate is a BCI sanctioned rating expressing ampere hours required to achieve an end voltage of 1.75V/cell at 27℃(80˚F) and represents the batteries maximum capacity.

B 5 hour rate is based on IEC (International Electrotechnical Commission) temperature standard of 30℃(86˚F).

C Reserve Capacity or Capacity - the number of minutes a battery can be discharged at 25 or 75 amps (56 amps for 8 volt batteries) at 27℃(80 ˚F)and maintain a voltage above 1.75V/cell .

D All dimensions taken from bottom of battery to top of terminal heights may vary according to type of terminals specified.

E Capacity @ 56 amps is 90 minutes.

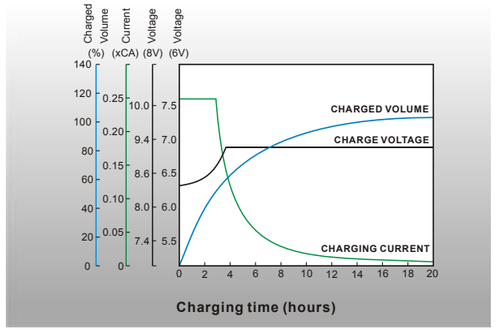
F Capacity @ 56 amps is 117 minutes.

G Capacity @ 56 amps is 132 minutes.

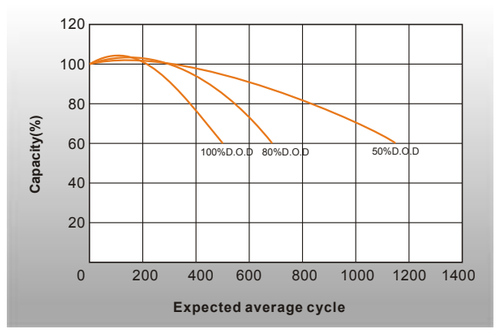
H Capacity @ 56 amps is 102 minutes.

Charge / Discharge Tables & Graphs

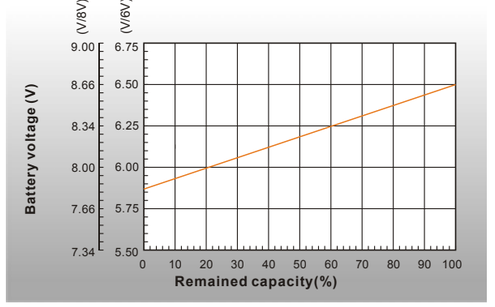
Constant voltage charging characteristic (0.25CA, 25˚C,77˚F)



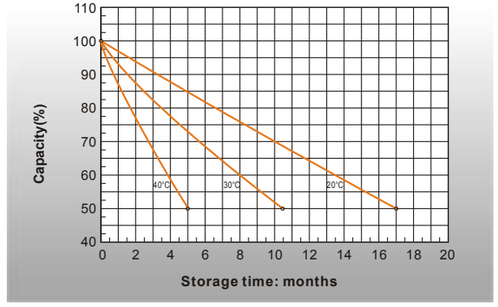
Cycle life in relation to depth of discharge



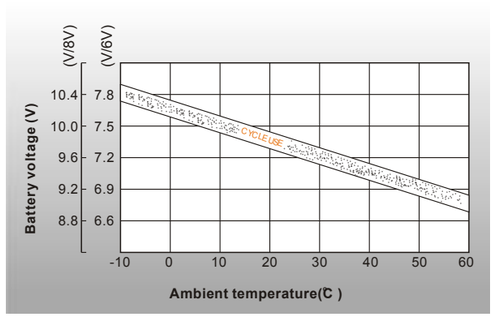
Relationship of OCV and state of charge (20℃)



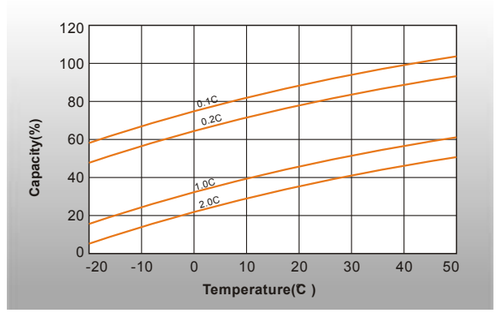
Self-discharge characteristic



Relationship between charging voltage and temperature



Temperature effects on capacity



FLAT PLATE GEL

DTG SERIES

DTG Series batteries are valve regulated , flat plate rechargeable lead-acid batteries which in contrast to conventional systems, retain the electrolyte is gel. It is this robust gel technology which gives the battery its absolute freedom from maintenance. Insensitive to occasional deep discharge. Better performance in high temperature environment.

GENERAL FEATURES

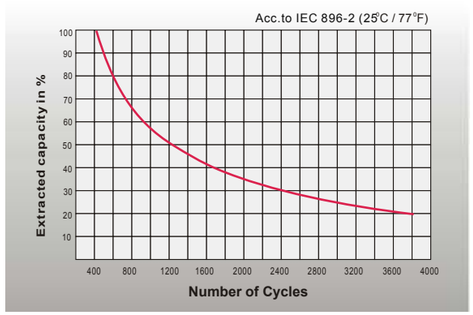
- Special plate design, long cycle lifetime.
- Using special lead-calcium alloy to boost up the grid anti-corrosive performance and extend the battery using lifetime.
- Using special separator to boost up the battery performance inside.
- Reduce water losing rate and lower the possibility of thermal runaway. Better performance under critical ambient temperature condition.
- High gas recombined reaction efficiency.
- Little water losing, no electrolyte stratification phenomenon.
- Long storage time.
- Good deep discharge resilience performance.
- Using gas silicon dioxide, small granule degree, bigger than surface area.

SPECIFICATIONS

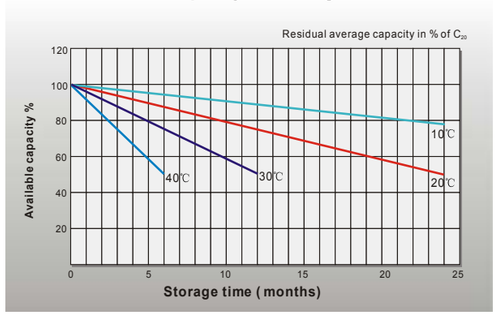
Model	Voltage (V)	Normal Capacity C5(Ah)	Normal Capacity C20(Ah)	CA 25A(min)	Approx Dimension(mm)				Approx Weight(Kg)	
					L	W	H	TH	Dry	Wet
DTG6180	6	145	180	375	260	180	248	287	21	29.4
DTG8155	8	125	155	300	260	180	248	287	25.3	32.8
DTG12135	12	110	135	255	330	182	248	288	32.2	42

Charge / Discharge Tables & Graphs

Cycle life in relation to depth of discharge



General relation of capacity vs. Storage time



FLOODED TUBULAR

DGF SERIES

DGF Series batteries are flooded tubular battery, rechargeable lead-acid batteries which in contrast to conventional systems, retain positive plates as tubular structure。

GENERAL FEATURES

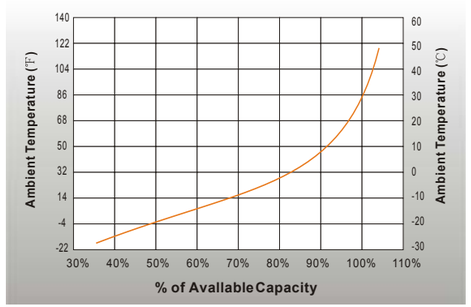
- Longer service life.
- Higher number of cycles.
- Reliable pillar sealing construction, absolute no pillar corrosion.
- Against short circuit design with the highest possibility to prevent any short circuit.
- Flexible option for automatic refilling system and air circulation system.
- Nonwoven protective gauntlet, better elastic, less pore size, less electrical resistance and higher air permeability.
- Flexible, fully isolated connector prevents any creeping current.
- Flip top plugs with special electrolyte level indication.
- Imported microporous catercorner separator with advanced quality provides higher porosity and lower electrical resistance.
- Containers and lids are made of polypropylene (PP). The impact resistance is very good.
- Patented terminal sealing construction fully prevents plate growth and electrolyte leakage.

SPECIFICATIONS

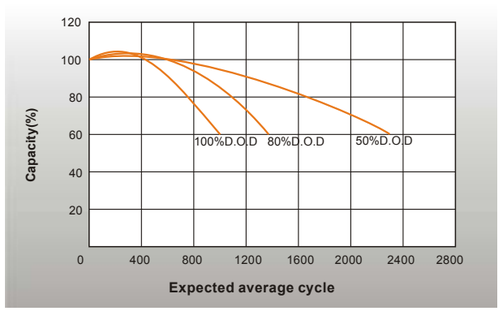
Model	Voltage (V)	Normal Capacity C_5(Ah)	Normal Capacity C_{20}(Ah)	CA 25A(min)	Approx Dimension(mm)				Approx Weight(Kg)	
					L	W	H	TH	Dry	Wet
DGF6210	6	180	210	420	260	180	248	288	21.6	29.4
DGF8140	8	120	140	270	260	180	248	288	20.0	27.5
DGF12140	12	120	140	270	328	180	248	288	28.6	40.1

Charge / Discharge Tables & Graphs

Operating Temperature vs. Capacity



Cycle life in relation to depth of discharge



TUBULAR GEL

DGG SERIES

DGG Series batteries are valve regulated, rechargeable lead-acid batteries which, in contrast to conventional systems, retain the electrolyte is gel and also are using of tubular plates to increase cycle life by preventing of material shedding and pressing of PAM specially in discharged state.

PERFORMANCE ADVANTAGES

- Longer service life.
- Higher number of cycles.
- Reliable pillar sealing construction, absolute no pillar corrosion.
- Against short circuit design with the highest possibility to prevent any short circuit.

CONSTRUCTION FEATURES

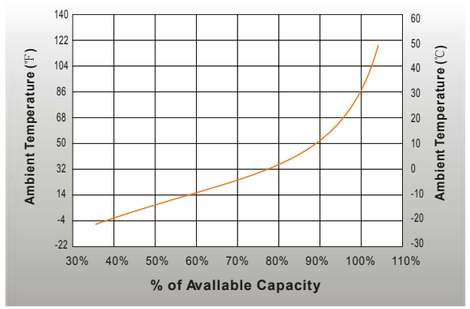
- Nonwoven protective gauntlet, better elastic, less pore size, less electrical resistance and higher air permeability.
- Flexible, fully isolated connector prevents any creeping current.
- Flip top plugs with special electrolyte level indication.
- Imported microporous catercorner separator with advanced quality provides higher porosity and lower electrical resistance.
- Containers and lids are made of polypropylene (PP). The impact resistance is very good.
- Patented terminal sealing construction fully prevents plate growth and electrolyte leakage.
- Completely sealing throughout the batteries life.
- Low gassing thanks to antimony-free alloy and internal oxygen recombination.
- Minimum space required and room requirements are minimal and no washing facilities needed, ventilation requirements are minimal.
- Easy to move and handle.
- Easy install using cable connectors with insulated terminal covers.
- Ready for immediate use without further commissioning work.
- Can be supplied as a standard vertical installation or by special request, for a horizontal installation.
- Very low self-discharge: <50% of rated capacity in 2 years at 20℃ ambient temperature.
- High cyclic ability over 1000 cycles when discharged at 80%DOD at 20℃.
- Deep discharge protected, a load can be connected to the battery for up to 4 weeks.
- No internal short circuits possible due to the structure.
- No acid stratification, so no equalizing charge necessary

SPECIFICATIONS

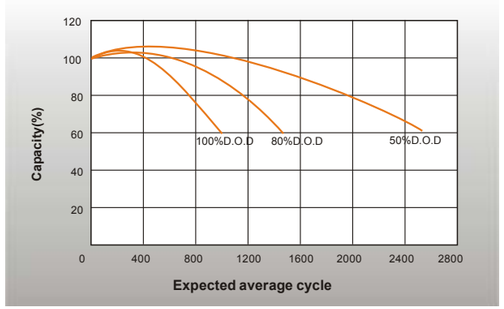
Model	Voltage (V)	Normal Capacity C_5(Ah)	Normal Capacity C_{20}(Ah)	CA 25A(min)	Approx Dimension(mm)				Approx Weight(Kg)	
					L	W	H	TH	Dry	Wet
DGG6180	6	150	180	375	260	180	248	288	22.6	30.0
DGG8120	8	100	120	225	260	180	248	288	20.7	28.0
DGG12120	12	100	120	225	328	180	248	288	30.0	40.9

Charge / Discharge Tables & Graphs

Operating Temperature vs. Capacity



Cycle life in relation to depth of discharge



LEOCH CUSTOMER CARE STATEMENT

We, Leoch International Technology Limited, take great pride in serving our customers in a courteous and professional manner, while supplying a quality product at competitive prices, delivered in an efficient, timely manner. At **LEOCH**, we strongly feel that our customer care is one of our greatest strengths.

Each of our customer service representatives under goes an intensive training program, and learns the latest in customer support techniques, and supported as well with state of the art customer management systems software.

We are in the business of fulfilling our customer's "wants and needs", whether that would be providing general information, or detailed order updates, and post order follow up. We will go the "extra mile" to earn your business, transaction after transaction.

For more information, please visit our website **WWW.LEOCH.COM** or email us at **export@leoch.com**

Focusing on the environmental friendly development, LEOCH commits on the harmony between human being and the ecosphere of the Earth, and delivering rechargeable electricity storage products for green energy systems. We know that the Earth we are living on is borrowed from the next generation...

ENVIRONMENTAL FRIENDLY