Safety - Performance - Sustainability

SHIDO®

LITHIUM ION BATTERIES

Catalogue

Power Sports Application

SHIDO®

LITHIUM ION BATTERIES

NOTES

Introduction

Finally DC-AFAM can introduce a high technology up-to-date battery for your todays motorcycle, Jet-Ski, or other Power Sports application. We have seen a huge improvement in the technology of Motorcycles and Power Sports Vehicles in the past 50 years. (See fig. 2, p6) But until now the battery technology stayed nearly the same. Strange, because without battery we all stand still…
Lithium polymer batteries comply with the rapid development of modern portable device industry. It was developed as a new type of high-energy secondary (rechargeable) battery at the end of the twentieth century. It has characteristic of light weight, high power and long service life. So this is a high level portable power supply product.

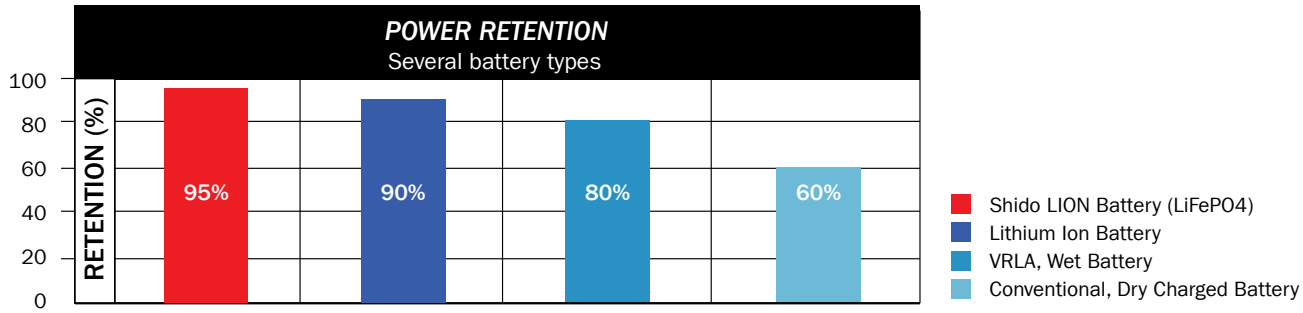
Now this new lithium - ion technology is transferred for the use in Power Sport start batteries. The result is a SHIDO LION battery that is perfectly adapted to bring the maximum power and comfort for use in your vehicle.
SHIDO LION batteries use Lithium Iron Phosphate (LiFePO4) as positive material, and Graphite (C) as negative material. This brings the use of top – technology with all his advantages, the nearest as possible to the characteristic use of Power Sport start batteries.
SHIDO Lithium Ion battery is formed by 4 Lithium Iron Phosphate battery cells connected in series, the battery voltage is 12.8 Volt.
This leads to the highest advantages for the use in Power Sport applications as Start – Battery. (See fig.1)

- *Superb cranking capacity*
- *1/3 to 1/5th lighter than Lead-Acid batteries*
- *No sulfating: longer service life*
- *Lower self discharge: longer shelf life*
- *Excellent cycle life: more than 2.000 cycles*
- *Drop-in replacement*
- *Less fuel consumption*
- *Super-fast recharge*
- *No explosion risk*
- *No maintenance*
- *Stable Discharge voltage*
- *No pollution, no lead & no acid*
- *Capacity Indicator*

Advantages

Power Retention *(fig. 1)*

Power retention in different types Lithium and Lead – Acid battery types.



Battery Comparison *(fig. 2)*

Battery Data comparison 1970's Motorcycle and 2013's Motorcycle

VS

COMPARISON BATTERY						
BMW R 60 [1970]			RATIO		**BMW S 1000 RR [2013]**	
MOTORCYCLE	Year	1970	+ 43 Y	MOTORCYCLE	Year	2013
	CC	600	+ 400 CC		CC	1000
	HP	40	+ 153 HP		HP	193
BATTERY	Weight (KG)	9,4	- 8,5 KG	BATTERY	Weight (KG)	0,9
	CCA (Amp)	180	+ 60 A		CCA (Amp)	240
	Volume (dm3)	2,6	- 1,4 dm3		Volume (dm3)	1,2
	Battery	53030			Battery	LTZ10S
	Battery Type	Lead Acid			Battery Type	SHIDO LION

Shido Lion Battery Data *(fig. 3)*

In this table you can find the comparison between traditional Lead – Acid batteries and their SHIDO LION alternative. Massive weight reduction, important Cranking Ampère's increase are clear. The capacity difference between Lithium Batteries and Lead-Acid batteries is explained on the next page.

SHIDO LION ITEM	REPLACE LEAD-ACID BATTERY TYPE	SHIDO LION Capacity (Ah)	LEAD ACID Capacity (Ah)	SHIDO LION APPROX. WEIGHT (KG)	LEAD ACID BATTERY WEIGHT WITH ACID (KG)	SHIDO LION Weight Reduction	SHIDO LION BATTERY CA (A)	LEAD ACID BATTERY CCA (A)	SHIDO LION CA Increase
LTX9-BS LION	YTX9-BS	3,0	8,0	0,7	2,9	-76%	180	120	+50%
LTX5L-BS LION	YTX5L-BS	1,6	4,0	0,4	1,4	-71%	105	70	+50%
LTZ10S LION	YTZ10S	4,0	8,6	0,9	2,9	-69%	240	150	+60%
LTX12-BS LION	YTX12-BS	3,5	10,0	0,9	3,5	-74%	210	145	+45%
LT12B-BS LION	YT12B-BS	4,8	10,0	1,1	3,6	-69%	290	190	+53%
LTZ7S LION	YTZ7S	2,4	6,0	0,6	2,0	-69%	150	110	+36%
LTX14-BS LION	YTX14-BS	4,0	12,0	1,1	4,8	-77%	240	170	+41%
LTX4L-BS LION	YTX4L-BS	1,6	3,0	0,4	1,4	-71%	80	50	+60%

Ah Capacity Difference: Lead-Acid vs Lithium *(fig. 4 & 5)*

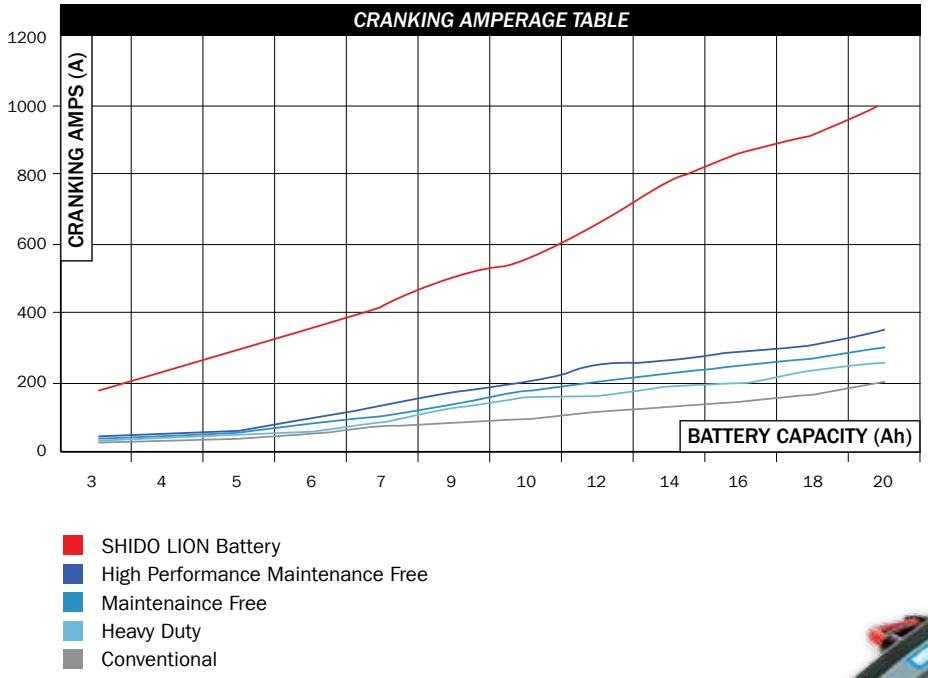
SHIDO LION batteries perform far better than their comparing Lead-Acid batteries. In the Cranking Amperage Table (fig. 4) you can see the ratio between Battery Capacity and Cranking Amps. But in the SHIDO LION Battery Data (fig. 5) you can see that SHIDO LION batteries have less Capacity than their traditional Lead-Acid comparable batteries. How is this possible?

THERE ARE 2 MAIN REASONS FOR THIS:

1 The Energy Density of SHIDO LION batteries is more than 5 times higher than for traditional Lead-Acid batteries. This means that in the same volume of Lead-Acid battery, the potential Energy is more than 5 times higher in SHIDO LION batteries.

2 Secondly, and even more important: SHIDO LION batteries have an extremely low internal resistance. This means that the energy inside the battery can come out much faster than in Lead-Acid batteries. This is very important during the start procedure of your engine.
The Maximum Discharge Rate for Lead-Acid is 15C. The Maximum Discharge Rate for SHIDO LION is 50C. More than 3 times better than Lead-Acid. C is the Capacity of the battery.

The lower Maximum Discharge Rate for Lead-Acid batteries is the main reason why Power Sports applications need big capacity batteries. We will make this clear with an example:
Suppose your start engine needs 150 Ampère to crank your engine.
If you use a traditional battery, you will need a Lead-Acid battery with a Capacity of at least 10 Ah. Because this battery will produce 150 Amps cranking current (15C = 15 x 10 Ah = 150 Amps). For example a Lead-Acid YTX12-BS has 10 Ah. The weight of this battery is 3,5 KG.
But if you use a SHIDO LION battery, a Capacity of 3 Ah will be sufficient. This battery also produces 150 Amps cranking current. (50C = 50 x 3 Ah = 150 Amps). For example the SHIDO LION LTX9-BS has 3 Ah. The weight of this SHIDO LION battery is 0,7 KG (which is 2,8 KG or 80% less weight than traditional Lead-Acid)
Technical knowhow and data tables in this catalogue are conform DWD SN01031961.



SHIDO LION ITEM	REPLACE LEAD-ACID BATTERY TYPE	SHIDO LION Capacity (Ah)	LEAD ACID Capacity (Ah)
LTX9-BS LION	YTX9-BS	3,0	8,0
LTX5L-BS LION	YTX5L-BS	1,6	4,0
LTZ10S LION	YTZ10S	4,0	8,6
LTX12-BS LION	YTX12-BS	3,5	10,0
LT12B-BS LION	YT12B-BS	4,8	10,0
LTZ7S LION	YTZ7S	2,4	6,0
LTX14-BS LION	YTX14-BS	4,0	12,0
LTX4L-BS LION	YTX4L-BS	1,6	3,0

Shido Lion Data Sheet

ITEM	Specifications			Volt	Capacity	CA	Energy	Dimensions (mm)			Weight	Charge Current (A)		Assembly Figure
	Led indicator	Water-proof	Q Terminal		Ah	A	Wh	L	W	H	(KG)	STD	MAX	
LB12B-B2 LION -S-	●			12	3,5	210	48	160	90	130	0,90	2,0	18,0	+ −
LB16AL-A2 LION -S-	●			12	4,8	290	54	207	72	164	1,10	2,5	24,0	− +
LTZ5S LION -S-	●	●		12	2,0	120	20	113	70	85	0,50	1,0	10,0	− +
LT7B-BS LION -S-	●			12	3,0	190	38	150	65	93	0,70	1,5	15,0	+ −
LTZ7S LION -S-	●	●		12	2,4	150	31	113	70	105	0,60	1,0	12,0	− +
LT9B-BS LION -S-	●			12	3,0	190	38	150	70	105	0,70	1,5	15,0	+ −
LTZ10S LION -S-	●			12	4,0	240	54	150	87	93	0,90	2,0	20,0	+ −
LT12B-BS LION -S-	●			12	4,8	290	54	150	69	130	1,10	2,5	24,0	+ −
LTZ12S LION -S-	●			12	4,5	290	60	150	87	110	1,10	2,5	22,0	+ −
LTZ14S LION -S-	●			12	4,5	290	60	150	87	110	1,10	2,5	22,0	+ −
LT14B-BS LION -S-	●			12	4,8	290	54	150	70	145	1,10	2,5	24,0	+ −
LTX4L-BS LION -S-	●			12	1,6	105	20	114	71	86	0,40	1,0	5,0	− +
LTX5L-BS LION -S-	●			12	1,6	105	20	114	71	106	0,40	1,0	5,0	− +
LTX7A-BS LION -S-	●			12	2,4	160	27	150	87	94	0,60	1,0	12,0	+ −
LTX7L-BS LION -S-	●	●		12	2,4	150	31	114	71	131	0,60	1,0	12,0	− +
LTX9-BS LION -S-	●			12	3,0	180	36	150	87	105	0,70	1,5	15,0	+ −
LT12A-BS LION -S-	●			12	3,5	210	48	150	87	105	0,90	2,0	18,0	+ −
LTX12-BS LION -S-	●			12	3,5	210	48	150	87	130	0,90	2,0	18,0	+ −
LTX14-BS LION -S-	●			12	4,0	240	66	150	87	145	1,10	2,0	20,0	+ −
LTX14H-BS LION -S-	●			12	4,0	240	66	150	87	145	1,10	2,0	20,0	+ −
LTX14AH-BS LION -S-	●	●		12	4,8	290	60	134	89	166	1,10	2,5	24,0	+ −
LTX14AHL-BS LION -S-	●	●		12	4,8	290	60	134	89	166	1,10	2,5	24,0	− +
LTX14L-BS LION -S-	●	●		12	4,8	290	60	150	87	145	1,10	2,5	24,0	− +
LTX15L-BS LION -S-	●			12	7,0	420	78	175	87	130	1,70	3,5	28,0	− +
LTX16-BS LION -S-	●	●		12	6,0	360	72	150	87	161	1,40	3,0	24,0	+ −
LTX16-BS-1 LION -S-	●	●		12	6,0	360	72	150	87	161	1,40	3,0	24,0	+ −

ITEM	Specifications			Volt	Capacity	CA	Energy	Dimensions (mm)			Weight	Charge Current (A)		Assembly Figure
	Led indicator	Water-proof	Q Terminal		Ah	A	Wh	L	W	H	(KG)	STD	MAX	
LTX18L-BS LION -S-	●			12	7,0	420	78	175	87	130	1,70	3,5	28,0	
LTX20-BS LION -S-	●			12	7,0	420	78	175	87	155	1,70	3,5	28,0	
LTX20L-BS LION -S-	●			12	7,0	420	78	175	87	155	1,70	3,5	28,0	
LTX20H-BS LION -S-	●			12	7,0	420	78	175	87	155	1,70	3,5	28,0	
LTX20HL-BS LION -S-	●			12	7,0	420	78	175	87	155	1,70	3,5	28,0	
LTX20CH-BS LION -S-	●	●		12	6,0	360	72	150	87	161	1,40	3,0	24,0	
51913 LION -S-	●			12	7,2	450	84	186	82	171	1,70	4,0	28,0	
LTX24HL-BS LION -S-	●			12	7,0	420	78	205	87	162	1,70	3,5	28,0	
LIX30L-BS LION -S-	●	●	●	12	8,2	540	98	166	126	175	2,00	4,0	36,0	

All batteries have the same terminal type: CU

All batteries have a LED indicator

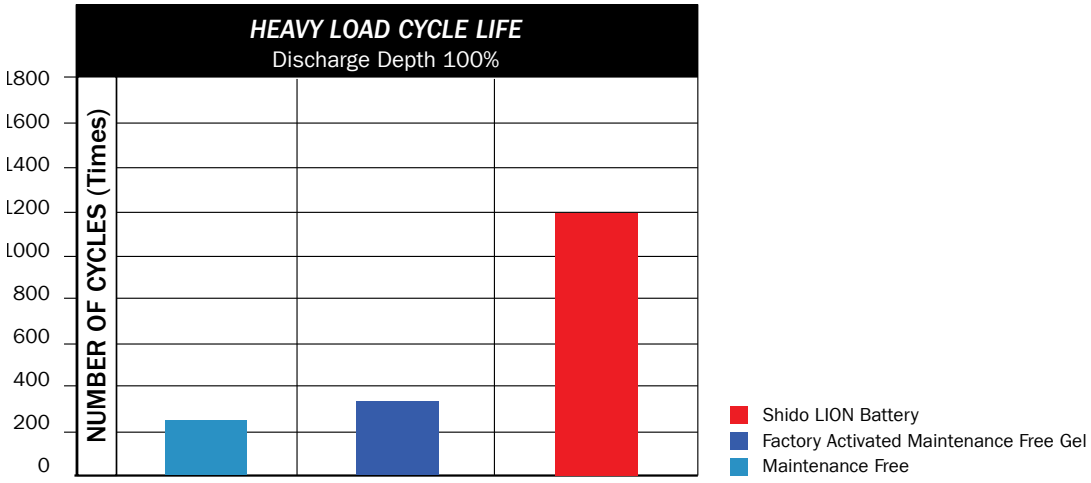
Waterproof sealed cover

Q(uadri) terminal

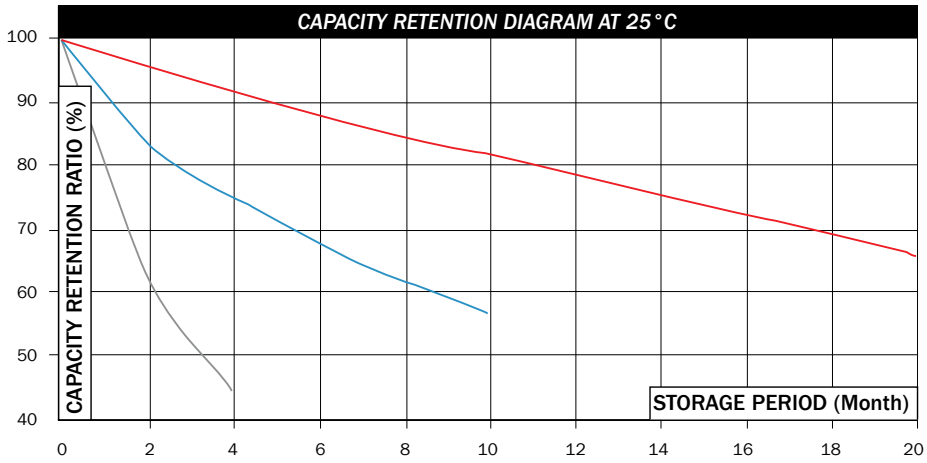
1 to 1 Drop - in replacement

Heavy load Cycle Life Diagram *(fig. 6)*

Average number of Life Cycles: SHIDO LION batteries produce around 4 times more life cycles as traditional Lead-Acid batteries



Capacity Retention Diagram @ 25° C *(fig. 7)*



In this diagram you can see the evolution of the Battery Capacity in accordance to the Storage Period. SHIDO LION batteries keep their capacity around 4 times longer than Lead-Acid batteries. This is important for the Shelf life when the batteries are in the distributers warehouse. But it is also important for the end user: the battery will keep her capacity much longer when the vehicle is not used. All SHIDO LION Batteries have a 3 LED Capacity Indicator.

Shido LION
Maintenance Free
Conventional

Indicator	Voltage (V) +/- 100mV	Action
3 Leds	OCV > 13,15 V	Battery fully Charged. Ready for use
2 Leds	OCV > 13,00 V	Battery able to start engine. Needs to be charged
1 Led	OCV < 12,80 V	Battery needs to be charged BEFORE engine start

SHIDO LION LED Indicator
OCV = Open Circuit Voltage

Main Advantages by Application *(fig. 9)*

Very Important
Important
Nice to have

MAIN ADVANTAGES SHIDO LION OVER LEAD - ACID BATTERIES FOR ALL # APPLICATIONS									
	SCOOTER & MOTORCYCLE						OTHER APPLICATIONS		
	SCOOTER	COMMUTER	HYPER SPORTS	BIG TWIN	MX/ ENDURO	CLASSIC	JET SKI	SNOW-MOBILE	ATV
HIGHER START CAPACITY	■	■	■	■	■	■	■	■	■
LOWER WEIGHT	■	■	■	■	■	■	■	■	■
LONGER CYCLE LIFE	■	■	■	■	■	■	■	■	■
FAST RECHARGE	■	■	■	■	■	■	■	■	■
LOW SELF DISCHARGE	■	■	■	■	■	■	■	■	■
LESS FUEL CONSUMPTION	■	■	■	■	■	■	■	■	■
NO POLLUTION	■	■	■	■	■	■	■	■	■

Frequently Asked Questions

1 HOW DOES A SHIDO LITHIUM BATTERY WORKS?

SHIDO Lithium Batteries are based on LiFePO4 (Lithium Iron Phosphate) technology. The charging- and discharging capability comes through the chemical reaction of the positive plates (LiFePO4) with the negative plates (Graphite).
There are 2 main reasons why SHIDO Lithium batteries are made with this technology:

- The OCV (Open Circuit Voltage) of these batteries is more stable than any other Lithium Ion battery

- OCV of one LiFePo4 cell is 3,2 Volt. SHIDO puts 4 cells in their Lithium batteries, so total OCV is 12,8Volt. Standard Lead-Acid Batteries have 6 cells of 2,1 Volt. So they have 12,6 Volt in total. This means that the LiFePo4 technology approach as close as possible the Lead-Acid OCV which is positive for the total electrical circuit of the motorcycle.
For the specialized chemists we give the chemical reaction hereby:
LiFePO4 + 6C = Li(1-X)FePO4 + C6LiX

2 DOES A SHIDO LITHIUM BATTERY LASTS LONGER THAN A CLASSIC LEAD-ACID BATTERY WHEN I DON'T USE MY BIKE FREQUENTLY?

Yes. Thanks to the lower self-discharge rate, the battery voltage will drop slower. This has advantages for the shops: the battery has a longer shelf life before it is installed and used in a motorcycle. And once installed, it will last longer without charging or use than a classic Lead-Acid battery.

3 THE CAPACITY OF SHIDO LION LITHIUM BATTERY IS LOWER THAN TRADITIONAL LEAD-ACID BATTERY. SO HOW CAN SHIDO LION LITHIUM BATTERY WORK AND PERFORM BETTER THAN TRADITIONAL BATTERIES?

SHIDO LION lithium battery is made of extremely high energy density lithium iron phosphate material, and it is designed by SHIDO LION patent technology. The watt density is 5 times more than existing lead-acid battery, and

Frequently Asked Questions *(Next)*

it can realize the high rate discharge capacity. So even though the capacity is lower than traditional battery, it can be used normally, and perform better than traditional batteries.
Moreover, Lead-acid batteries need the higher capacity to produce the necessary CCA values to start the engines. SHIDO LION batteries produce this CCA without these higher capacities.

4 WHAT ARE THE ADVANTAGES OF SHIDO LITHIUM BATTERIES OVER NORMAL LEAD-ACID BATTERIES?

- Superb Cranking Capacity: up to 50% more than Lead-Acid batteries
- Weight: between 1/3 and 1/5th of Lead-Acid batteries
- No Sulfating: longer service life
- Lower Self Discharge: longer shelf life in the warehouse before use
- Excellent Cycle Life: more than 2.000 cycles (Lead – Acid batteries: +/- 300)
- Drop-in replacement: 1 to 1 replacement dimensions for OEM battery
- Less Fuel Consumption: thanks to higher OCV the engine works more efficient
- Super-fast Recharge: very high recharging rate trough high current
- No explosion risk: no gasses are produced during charge or discharge
- No maintenance: no acid fill, no leak risk, installation in any direction
- Stable Discharge Voltage: better engine performance, easy engine start
- Ecological advantage: no pollution, no lead, no acid, safe & normal disposal

5 WHAT'S THE DIFFERENCE BETWEEN SHIDO LION LITHIUM BATTERY AND OTHER LITHIUM BATTERIES?

Compared with Digital lithium battery (such as cellphone battery) and lithium power supply battery (such as E-bike battery), SHIDO LION lithium engine start battery have the difference from Material, Voltage, Energy density, discharge rate, safety, cycle life, the detail table is below (fig.10).

6 WHAT MEANS THE WH INDICATION ON THE FRONT SIDE OF EACH BATTERY

On every SHIDO LION Battery you can see some technical information. Off course the tension: 12 Volt. But also the total amount of electrical energy that this battery can supply. This amount is the figure in Wh (Watt Hour) that you can find on the front side of each SHIDO LION battery.

7 WHAT IS THE PURPOSE OF THE BATTERY MANAGEMENT SYSTEM (BMC) IN THE SHIDO LION BATTERIES?

Inside every SHIDO LION battery there are 4 cells. The BMC management makes sure that all 4 cells are charged and discharged in perfect balance. Like this the power that comes out of the battery is much more stable which helps the overall performance of the battery in giving off her power.
From the other side, the management system also takes care of the balanced charge of the 4 battery cells.
All together the result is longer lifetime of the SHIDO LION batteries compared to other lithium batteries.

8 WHAT ARE THE DISADVANTAGES OF SHIDO LITHIUM BATTERIES?

- Higher price than Lead-Acid batteries
- Loss of power in very cold conditions (lower than -10 degrees Celsius)

fig. 10

DIFFERENT LITHIUM ION BATTERY TYPE PERFORMANCE COMPARISON TABLE

Item	lithium Battery for Digital product	Lithium power supply battery	SHIDO LION lithium engine start battery
Main material	Cobalt Oxide or NCM	Manganese Oxide or NCM	Lithium Iron Phosphate
Standard voltage (V)	3.6 or 3.7	3.6 or 3.7	3.2
Weight Energy density	Higher	Higher	High
Volume Energy density	Higher	Higher	High
Max discharge rate (C)	0.5C	2C	50C
Cycle life	300	500	2.000
Safety	Potential risk of fire and explosion	Potential risk of fire and explosion	No fire, No explosion
Environment friendly level	Medium	Medium	High

9 WHAT IS THE DIFFERENCE BETWEEN SHIDO LITHIUM BATTERIES AND CLASSIC LEAD-ACID BATTERIES?

Not relevant. SHIDO Lithium batteries are totally different from any other kind of batteries. The only thing what they have in common is the exact dimensions and the polarity (placement of Plus and Minus Terminals).

10 HAVE SHIDO LITHIUM BATTERIES THE SAME DIMENSIONS AS THE OE FITTED BATTERIES?

SHIDO Lithium batteries are made to the exact same dimensions and polarities as the standard OE battery dimensions. So they can be replaced 1 to 1 without any modification. There is a cross reference list available that shows the SHIDO LION alternative battery for the most common traditional batteries.
But for some different types of SHIDO LION batteries we use the same container.
For this reason we will equip high density stick foam sheet or plastic spacer in the box. You can Install the spacer at the bottom of the battery to adjust the battery's height, or stick on the sides or bottom to fit original battery size. This job can be finished in a few minutes. This ensures SHIDO LION battery maintain same size as original battery. Check the details in SHIDO LION installation guide.

11 WHAT IS THE PURPOSE OF THE LED INDICATOR ON TOP OF THE SHIDO LION BATTERIES?

Every SHIDO LION Battery has a Battery Led Indicator. The 3 leds give the charge state of the battery:

FULL = 3 Led
Battery fully charged and ready to use

MED = 2 Led
Battery able to start engine. But needs to be charged

LOW = 1 Led
Battery needs to be charged BEFORE starting the engine

12 SOME TYPES IN THE SHIDO LION RANGE HAVE THE INDICATION WATERPROOF. WHAT DOES THIS MEAN?

These Waterproof types are specially designed for Jet Ski applications. The sealing between cover and container is waterproof so there is absolutely no risk of water seeping into the battery

13 WHAT IS THE SERVICE LIFE OF A SHIDO LION BATTERY?

That depends on many factors. Under the worst conditions, standard lead acid batteries may last only a few weeks and under the best about five years. In average lead-acid batteries will last 1 to 2 years. Under the same average usage conditions, we expect SHIDO LION to last roughly double, or 2 to 4 years.
All depends on the battery care. Regular use, regular extra charge when not in use will be determinative in the final battery life.

14 CAN SHIDO LION BATTERY BE MOUNTED IN ANY POSITION?

Yes, because there are no liquids in the SHIDO LION batteries. Any direction installation is permitted, including upside down.

15 HOW DO YOU CHECK THE REMAINING CAPACITY FOR SHIDO LION LITHIUM BATTERY?

We measure the battery open circuit voltage with a multi meter, then we can preliminary judge the remaining capacity of the battery. Remove the battery, and measure the battery open circuit voltage by multi meter. Then check corresponding remaining voltage in following sheet:

THE CORRELATION TABLE OF VOLTAGE AND CAPACITY FOR SHIDO LITHIUM ION BATTERY

OCV (V)	CAPACITY REMAINING
14.34	100%
13.30	90%
13.27	80%
13.16	70%
13.13	60%
13.12	50%
13.10	40%
13.00	30%
12.87	20%
12.73	10%
9.20	0%

NOTE: Do not allow resting voltage to fall below 12.50V

16 HOW DOES A SHIDO LION BATTERY REACTS ON COLD OR HOT TEMPERATURES?

The resistance of SHIDO LION batteries increases at low temperatures. But they will do their job until -10 degrees Celsius.
But thanks to the special techniques and the management system built in the SHIDO LION batteries, they will perform much better than other Lithium batteries in cold conditions.
There is also a simple trick you can use: if the battery performs poor under extreme cold conditions, use your headlight during 10 – 15 seconds before cranking. This will warm up the battery and afterwards she will perform better.
From the other side, SHIDO LION batteries can be used in hot circumstances. The battery works perfect even when the environment temperature reaches 60° Celsius. By this temperature the battery can still supply her full power. This is an advantage over standard Lead-Acid batteries who lose their power in hot environment.

17 WHY WE SAY THE SHIDO LION BATTERY CAN SAVE FUEL?

The voltage of lead acid battery is 12V, the voltage will reduce as the capacity falls as the battery is operating. This leads to action efficiency weakness of spark plugs. But the voltage of SHIDO LION battery is 13V, and stable. The 1V voltage difference ensures the spark plugs be always in great form. It can improve the efficiency of spark plugs, producing bigger sparks, then the gasoline will be burnt more completely, unit kinetic energy increases the engine torque, which can improve vehicle running kinetic energy, ultimately improving fuel-efficiency.

18 HOW CAN I DISPOSE A SHIDO LION BATTERY AFTER USE?

That depends on your local and national regulations. SHIDO Lithium batteries meet the European RoHS standards for environmental health, and contain no lead. Check with your local authority to see if LiFePO4 batteries are allowed.

19 CAN I USE A REGULAR BATTERY CHARGER TO CHARGE MY SHIDO LION BATTERY?

SHIDO LION batteries can be charged with most intelligent Lead-Acid battery chargers. However, there is **ONE VERY IMPORTANT RESTRICTION:**
Every intelligent Lead-Acid charger has a desulfation mode. And this desulfating mode works different depending on the charger brand or type. Some chargers use a high current pulse to desulfate the Lead-Acid batteries. This is safe for SHIDO Lithium batteries. But others use a high Voltage mode to desulfate Lead-Acid batteries. And this is dangerous for EVERY lithium battery. This high voltage can damage the internal cells of Lithium batteries. As a general rule: check if your charger NEVER

Frequently Asked Questions *(Next)*

goes above 15 Volt, and it can be used properly for Lithium batteries. Chargers that use a high voltage characteristic, must also check the internal resistance of the battery. Some intelligent chargers will recognize that the internal resistance is low in SHIDO LION batteries. That is why they judge that the battery is not sulfated and they will not switch to the high voltage mode. But anyway you must be very careful with this kind of chargers. Another typical fact on SHIDO LION batteries is that they don't like "Trickle Charging". Trickle charging is the stage where the battery cells lie under constant light over – voltage to compensate the natural self – discharge.

20 WHAT IS RIGHT CHARGE CURRENT TO CHARGE MY SHIDO LION BATTERY?

In the manual you can find the Charge Current values for each type of SHIDO LION Battery. We indicate 2 different values: one is Standard (STD), the other one is the Maximum charge current.
It is always better to charge your SHIDO LION battery with the STD charge value. It will take longer, but it is better for the service life of the battery.

But SHIDO LION batteries have the ability that they can be charged with high currents. In this case it will take much less time to charge your battery. This is the Maximum charge current that is indicated in the manual. We advise to use this MAX charge current only when it is really necessary.

21 DOES MY SHIDO LION BATTERY REQUIRES A TOP CHARGE BEFORE USE?

Here is No Doubt: YES!! Every battery needs a top charge before being used. It will prolong the service life of your battery and it will also give your battery a higher energy density. Even if the indicator shows 3 LED's, a short Top Charge is advised. Your SHIDO LION battery is a piece of high technology in your motorcycle so it should be handled with most care from the very beginning.

22 WHY DOES SHIDO LION BATTERIES HAVE HIGHER CRANKING POWER?

The cranking power of a battery is indicated in Ampere. This is the current that a battery can supply to the start engine to start the motorcycle engine. The higher the current, the higher the rpm of the start engine will be and the easier the engine will start.
SHIDO LION batteries have a CA (Cranking Ampere) that is up to 50% higher than comparable lead-acid batteries. This is very important for all motorcycles, but even more for big twins.

23 WHY IS A SHIDO LION BATTERY SO MUCH LIGHTER THAN A CONVENTIONAL LEAD-ACID BATTERY?

Just look at the name of the two different kind of batteries: LITHIUM VS LEAD ACID
The basically elements in SHIDO LION batteries are Lithium and Carbon.
In lead acid it is Lead. Besides to very new technology of SHIDO LION batteries, only the specific gravity of both base elements in the two different battery types make a world of difference.

24 WHY DO ALL SHIDO LION BATTERIES HAVE COPPER TERMINALS?

Thanks to the lower internal resistance of Copper (CU), the conductivity of current in Copper Terminals is 10 x higher than in Lead (Pb) terminals. All the energy that your SHIDO LION battery has to conduct passes through the terminals. One of the biggest advantages of SHIDO LION batteries is the ability to discharge (ex: during cranking) and to charge very fast. So the Copper terminals give the SHIDO LION batteries an enhanced electrical and mechanical performance

25 HOW LONG ARE SHIDO LION BATTERIES GUARANTEED?

We guarantee our SHIDO LION batteries for one year. This is under the condition that the battery received the proper maintenance and care.

26 HOW LONG IS THE SHELF LIFE OF SHIDO LION BATTERIES?

Compare to lead acid battery (6 months), the SHIDO LION battery can be stored for more than a year.

27 WHAT IS THE BEST WAY TO KEEP THE SHIDO LITHIUM BATTERY CAPACITY IN GOOD SHAPE?

- Regular charging. If not in use
- Disconnect if not in use
- Store in a dry and fresh place

NOTES

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