

MAXTON Battery

<<< LASTING • SAFE • ENVIRONMENTAL PROTECTION



MPa Series

MAXTON POWER TECH CO.,LTD.



Maxton Power Tech Co.,Ltd. Is a professional manufacturer of rechargeable battery in the design, manufacture and supply of clean and green batteries and energy for a wide range of applications worldwide, was set up in 2000 year, and now has 2 plants (one is in Guangdong province, another is in Jiangsu province, with total manufacturing facilities of around 90,000 square metres, combining industry experience, innovative product development and knowledge based services, Maxton has set the standard for dependable and maintenance-free, advanced VRLA battery.

Maxton Power Tech Co.,Ltd. Is approved by the international organization: ISO9001 and ISO14001. Each battery is approved by UL and CE

Maxton batteries have AGM technology, GEL technology:

1):

Battery with AGM technology:

MP range (including MPa, MPb, and MPt series)

MPE series (deep cycle battery)

MPF series (Front terminal battery)

MPHR series (High discharge rate battery)

2):

Battery with GEL technology:

MPG series (GEL battery)

3):

Battery with Tubular technology:

MPPS series (OPzS battery)

MPPV series (OPzV battery)

4):

Battery (Maintenance-free) for car

5):

Lithium Iron Phosphate (LiFePO₄) Rechargeable Battery

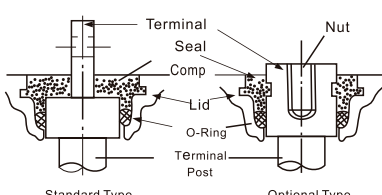
Maxton Power Tech Co.,Ltd does not provide the reliable battery and technology but also provides an excellent service, Maxton is still improving her service constantly.

Quality is the first important and nuclear factor in Maxton, also is the first major topic in the cooperation between Maxton and anyone buyer, striving for perfection, relying on quality.

Maxton team is cherishing any opportunity you are giving, is trying to build a longer cooperation relation with you hand in hand also develop together!

MAXTON Battery

<<< CONSTRUCTION AND FUNCTIONS

Parts	Material of Construction	Functions
Positive & Negative Plates	Pasted type plate in which special lead-calcium alloy grids are pasted with active material.	- Retain sufficient capacity. - Maintain capacity performance for long period of time (long life performance.) - Minimize self-discharge.
Separator	- Mat made of glass fibres with excellent heat oxidation resistance. - PVC or PE	- Prevents short circuit between positive and negative plates. - Retains electrolyte. - Prevents active material fall by pressing plate surfaces.
Electrolyte	Dilute sulphuric acid in quantity to preclude free electrolyte.	Causes electron motive reaction in negative and positive active material.
Container & Cover	- ABS synthetic resin. - ABS no burn	- Accommodates plate group consisting of positive and negative plates and separators. - Retains sufficient mechanical strength to withstand battery internal pressure.
Safety Valve	- Synthetic rubber with excellent acid resistance and little deterioration by aging. - In cap shape.	- Releases gas if cell internal pressure rises abnormal high and normalizes internal pressure. - Prevents ingress of oxygen.
Terminal	 Standard Type Optional Type - Made of copper or lead alloy integrally moulded with terminal post. - Terminal section employs dual complete seal construction of oring and sealing compound. - Color of sealing compound: red for positive section and black for negative section. - Optional type has a nut embedded in terminal.	- Terminal with a large and non welded sectional area enhances high rate discharge characteristics and reliability. - Perfect seal is given at a terminal sealing section. - Facilitates fixing of connecting bars and take off terminal.

CHARGING



1 Two Stage charging: (Constant current to constant voltage).

This is the recommended method of charging SLA batteries, it is necessary to strictly control the actual charging voltage to ensure it is within the Limited figure.

Fig.1 shows the charge characteristics at a constant current (0.1C(A)) and a constant voltage 2.40V/(cell) after discharge of 50% and 100% of the 20HR rated capacity.

The time required to complete the charging varies by the amount of the previous discharge, initial charge current and temperature.

As shown in Fig 1 charging a fully discharged battery by constant current and constant voltage of 0.1C(A) and 2.40V/cell respectively at 25°C (77 °F) will put back more than 100% of the previous discharge in 24 hours.

Since the battery does not restrict the initial charge current, making it shorten the time for a charge of more than 100%.

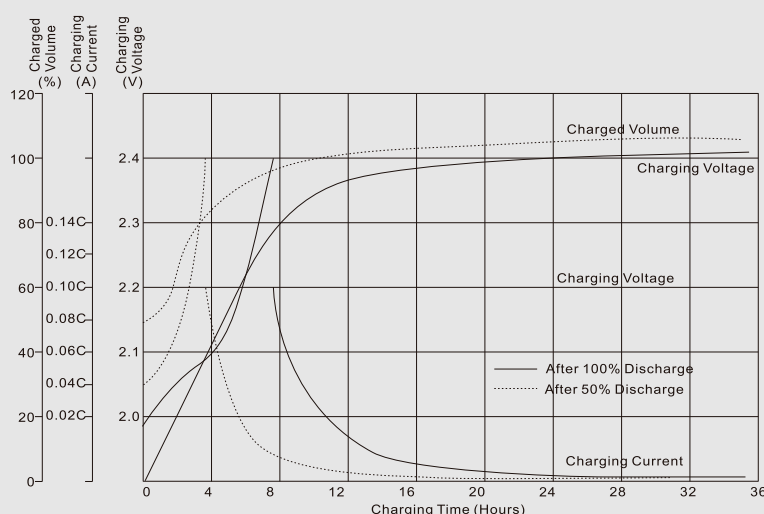


Fig 1 Charging Characteristics(25°C/77°F)

2 Floating Charge:

Floating charge voltage must be kept at a value high enough to compensate the battery self-discharge so the battery can be in a fully charged condition at all time

The optimum charge voltage for Maxton Battery is 2.25V per cell under normal temperature condition (25°C /77°F)

3 SUPPLEMENTARY CHARGING

Part of the battery capacity will have been lost due to self-discharge during transportation or storage. Give supplementary charge before putting into service.

The supplementary charge should be given by every six months, the charge condition in Table 1.

Table 1: Condition of Supplementary Charge

Storage Period	Charge Voltage per cell	Charge Time
Not more than 1 year	2.23v/cell	More than 3 days
	2.28v/cell	2-6 days
1-2 year	2.28v/cell	3-6 days

4 The relation of charging voltage and ambient temperature:

The charging voltage shall be 2.40 volts per cell at (25°C/77°F).

However, as the average ambient temperature rises, charging voltage should be reduced to prevent overcharge, the otherwise the average ambient temperature reduce, charging voltage should be raised to prevent under-charge accordingly, the recommended compensation factor is -3mV, per cell at 25°C (77°F) of standard point.

DISCHARGE

<<< CHARACTERISTICS

Fig 2 Differences rate discharge curves(25°C/77°F):

The higher the discharge current, the shorter the discharge time, Sunnyway Battery have a excellent high discharge capacity, the relation between discharge current and time is in fig 2

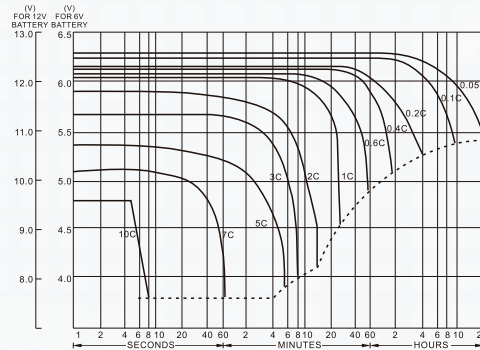
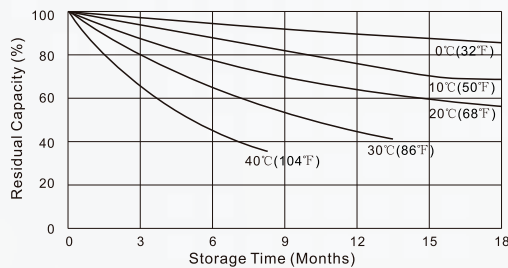
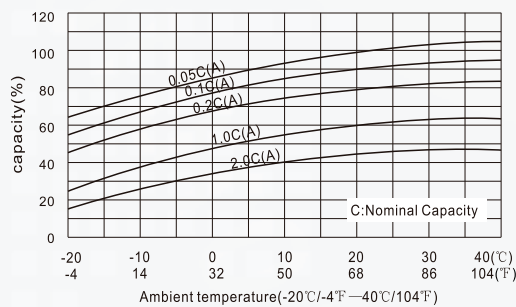


Fig 3 Self-discharge characteristics



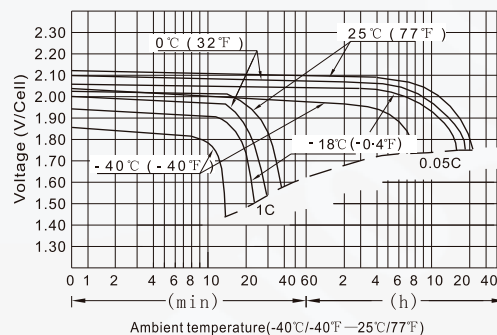
The self-discharge is affected by ambient temperature and storage time, the higher temperature and longer storage time the more self-discharge; the relation is in Fig 3.

Fig 4 Effect of Temperature on capacity



The battery capacity is affected by ambient temperature and discharge current as shown in Fig 4. Fig 5.

Fig 5 Effect of Temperature on capacity



BATTERY TESTING

<<< AND STANDARDS

1 Capacity

The discharge capacity is taken by discharging the battery at the discharge

current under the ambient temperature as set forth in the specification. The charge before and after the above discharge must be carried out in the method indicated in the specification in the specification, discharge the battery at 0.25CA up to 3.5V/4V, 5.25V/6V and 10.5V/12V battery.

In each case the discharging time must be no less than 180 minutes. The charge will be performed under the conditions of 4.80V-5.00V/4V, 7.20-7.50V/6V and 14.40V-15.00V/12.00V battery (Maximum current: less than 0.4CA).

2 Cyclic Life Test

This test is carried out under the ambient temperature and the charge/discharge conditions as required by the specification, in case the charge/discharge conditions are not set forth in the specification, the charge and discharge must be repeated under the ambient temperature at 25°C / 77°F, the resistance load discharge current is 0.25CA, discharge cut-off voltage of discharge: 3.5V/4V, 5.25V/6V, 1.50V/12V, max, current 0.4CA or less for charge. the cyclic life must be held at 50% of the initial discharge capacity and last for at least 150 cycles.

3 Overcharge Test

The fully charged battery is overcharged in this test at the constant current of 0.1CA for 48 hours, and then stands for one hour.

Then the battery is continuously discharged at a constant current of 0.05CA until it discharges to an average of 1.75V per cell.

The appearance of tested battery after the test must be free of irregular conditions, and the capacity should be 95% or the nominal capacity.

4 Sealing Test

The following functions must be satisfied by the fully charged battery after it is overcharged for 48 consecutive hours at a 0.1CA current and for 24 consecutive hours at a 0.005CA current.

(a) Sealing Reaction Efficiency

The sealing reaction efficiency must be 90% or more of the quantity of electricity which is converted by 25°C (77°F) 1atm per Ah.

(b) Safety valve Function

The safety valve must be opened or closed without fail within the range of internal pressure of the battery from 30kpa to 50kpa.

(c) Safety

The battery must be free of leaks and other defects.

5 storage Test

The fully charged battery will be stored for 6 months under the temperature of 20±5°C (68±9°F) the discharged continually at the constant current of 0.05CA up to the average cut-off voltage of discharge of 1.75V per cell.

The capacity at this time must be 60% or more of the nominal capacity.

6 vibration Test

a vibration of 1000 cycles per minute at the full amplitude of 4mm will be applied on any side of the fully charged battery for 60min. then check to if the battery has endured against the vibration, test without any broken parts or leaks, and its terminal voltage is held higher than the nominal voltage.

7 Shock Test

The fully charged battery will be dropped three times without applying any extra force from 0.2m high onto a harden wood (about 50mm thick) Then check to see if the battery has endured in the test without noticeable breakage or leaks, and its terminal voltage is held higher than the nominal voltage.

8 Other Tests

Other tests, if required by the specification, shall be conducted according to the instructions given in the specification.

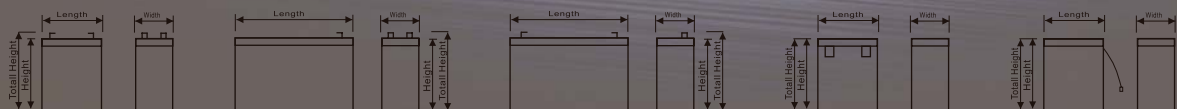


MPa | MAXTON Power

<<< (Valve Regulated Lead-Acid Battery)



External dimension (battery outside dimension)



MPa Series

General features

Sealed Construction

MAXTON's unique construction and sealing technique guarantees that no electrolyte leakage can occur from the terminals or case of any MAXTON battery. This feature insures safe and efficient operation of MAXTON battery in the correct position. MAXTON battery are classified as "Non-Spillable" and will meet all requirements of the International Air Transport Association (IATA).

Maintenance-Free Operation

During the expected float service life of MAXTON battery, no need to check the specific gravity of the electrolyte, nor add electrolyte. In fact, there is no provision for these maintenance functions.

Low Pressure Venting System

MAXTON's Battery is equipped with a safe low pressure venting system, which operates from 1 psi to 6 psi. The venting system is designed to release excess gas in the event that the gas pressure rises to a level above the normal rate. Afterwards, the venting system automatically re-seals itself when the gas pressure level returns its normal rate. This feature prevents excessive build up of gas in the batteries. This low pressure venting system, coupled with the extraordinarily high recombination efficiency, make the battery the safest sealed lead-acid batteries available.

Application Fields

Below list is common applications, it is not limited to standby or primary power for.

- Alarm Systems
- Marine Equipment
- Cable Television
- Medical Equipment
- Communications Equipment
- Micro Processor Based Office Machines
- Control Equipment
- Portable Cine & Video Lights
- Computers
- Power Tools
- Electronic Cash Registers
- Solar Powered Systems
- Electronic Test Equipment
- Telecommunications Systems
- Electric Powered Bicycle and Wheelchairs
- Television & Video Recorders
- Emergency Lighting Systems
- Toys
- Fire & Security Systems
- Uninterruptible Power Supplies
- Geophysical Equipment
- Vending Machines



Low Self Discharge

MAXTON's batteries can be stored for long period in the correct temperature without recharge because of the use of Lead Calcium grids alloy.

Long Service Life, Float or Cyclic

MAXTON's Battery has a long life in float or cyclic service.

Heavy Duty Grids

The heavy-duty lead calcium-alloy grids in MAXTON battery provide an extra margin of performance and service life in both float or cyclic applications, even in the condition of deep discharge.

Stable quality & High Reliability

MAXTON's battery is well-known for its stable and reliable performance in the Chinese mainland also the overseas market. MAXTON batteries are easy to maintain; thus, permitting a safe and proper operation of the equipment that the battery powers. The battery can withstand overcharge, also capable of extended storage.

Construction

Positive & negative plate

Positive & negative plates are made from Lead-Calcium system.

Separators

The glass fiber separator in MAXTON's VRLA battery has high resistance to acid, the high porosity of the separator retains adequate electrolyte for the reaction of active materials in the plate.

Safety Vents

The venting system operates at 1 psi to 6 psi (0.07-0.43kg/cm²) is designed to release excess gas and keep the internal pressure within in the optimum range of safety, at the same time it protects the negative plates from contamination from oxygen in the air. Vents are 100% visually inspected in the product-line of producing VRLA battery.

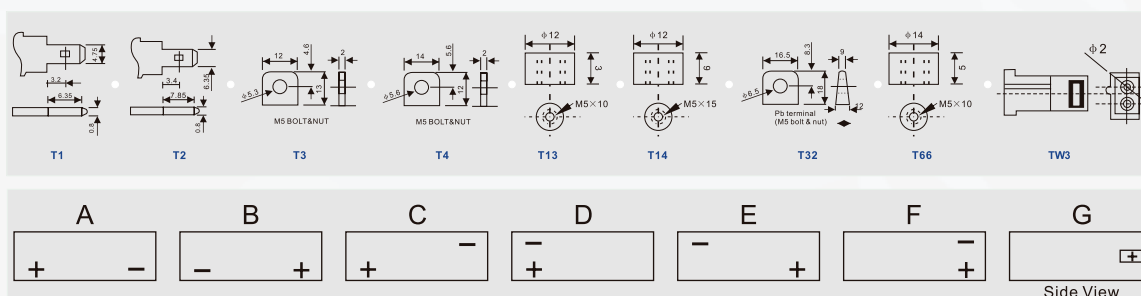
Terminals

Depending on the battery model, the terminal may be T1, T2, ..., T13. Excellent terminal sealing construction has been achieved by using long mechanical sealing paths and a selection of small shrinkage ratios for the sealing materials.

Case materials

Standard case and cover are made from ABS resin. (Case is available flame retardant ABS in need)

Terminal drawing & position



MPa series

<<< (Valve Regulated Lead Acid Battery)

Battery Model	Nominal Voltage (V)	Capacity 1.75V/Cell (Ah)	External Dimension								Weight Approx		Terminal Model & position	
			Length		Width		Height		Total Height		kg	pound	Model	Position
			mm	inch	mm	inch	mm	inch	mm	inch				
MP4-4.5	4	4.5	48	1.89	46	1.81	101	3.98	106	4.17	0.51	1.12	T1	B
MP4-10	4	10	102	4.02	44	1.73	95	3.74	100	3.94	1.05	2.31	T1	B
MP6-1	6	1	51	2.01	42	1.65	51	2.01	56	2.20	0.26	0.57	T1	E
MP6-1.3	6	1.3	98	3.86	25	0.98	52	2.05	56	2.20	0.26	0.57	T1	A
MP6-2.8	6	2.8	66	2.60	33	1.30	97	3.82	103	4.06	0.49	1.08	T1	C
MP6-3.3	6	3.3	134	5.28	34	1.34	60	2.36	66	2.60	0.62	1.37	T1	B
MP6-4	6	4	70	2.76	47	1.85	101	3.98	106	4.17	0.67	1.48	T1	C
MP6-4s	6	4	70	2.76	47	1.85	101	3.98	106	4.17	0.65	1.44	T1	C
MP6-4II	6	4	194	57.66	25.3	1.00	62	2.44	62	2.44	0.71	1.57	TW16	C
MP6-4.5	6	4.5	70	2.76	47	1.85	101	3.98	106	4.17	0.72	1.59	T1	C
MP6-4.5s	6	4.5	70	2.76	47	1.85	101	3.98	106	4.17	0.70	1.54	T1	C
MP6-5	6	5	70	2.76	47	1.85	101	3.98	106	4.17	0.75	1.65	T1	C
MP6-7	6	7	151	5.94	34	1.34	94	3.70	100	3.94	1.10	2.43	T1, T2	A
MP6-8	6	8	151	5.94	34	1.34	94	3.70	100	3.94	1.28	2.82	T1, T2	C
MP6-9	6	9	99	3.90	56	2.20	118	4.65	118	4.65	1.20	2.65	T1, T2	E
MP6-10	6	10	151	5.94	50	1.97	94	3.70	100	3.94	1.57	3.46	T1, T2	A
MP6-12	6	12	151	5.94	50	1.97	94	3.70	100	3.94	1.70	3.75	T1, T2	A
MP6-14	6	14	108	4.25	70	2.76	140	5.51	140	5.51	2.25	4.96	TW10, T62	G
MP6-20	6	20	157	6.18	83	3.27	125	4.92	125	4.92	2.90	6.39	T3	A
MP8-3.2	8	3.2	68	2.68	48	1.89	91	3.58	91	3.58	0.73	1.61	T25	A
MP12-0.8	12	0.8	96	3.78	25	0.98	62	2.44	62	2.44	0.33	0.73	T21	G
MP12-1	12	1	98	3.86	43	1.69	52	2.05	57	2.24	0.50	1.11	T1	D
MP12-1.3	12	1.3	98	3.86	43	1.69	52	2.05	57	2.24	0.53	1.17	T1	D
MP12-2	12	2.0	70.7	2.78	48	1.89	98	3.86	103	4.06	0.77	1.70	T1	A
MP12-2II	12	2.0	178	7.01	35	1.38	60	2.36	66	2.60	0.82	1.81	T1	A
MP12-2.3	12	2.3	178	7.01	34	1.34	60	2.36	66	2.60	0.90	1.98	T1	A
MP12-2.7	12	2.7	79	3.11	55.5	2.19	98.5	3.88	104	4.09	1.02	2.25	T1	A
MP12-3.3	12	3.3	134	5.28	66	2.60	60	2.36	66	2.60	1.24	2.73	T1	A
MP12-4	12	4	90	3.54	70	2.76	101	3.98	106	4.17	1.33	2.93	T1, T2	A
MP12-4II	12	4	194	7.64	47	1.85	70	2.76	75	2.95	2.95	3.20	T1	D
MP12-4.5	12	4.5	90	3.54	70	2.76	101	3.98	106	4.17	1.46	3.22	T1, T2	A
MP12-5	12	5	90	3.54	70	2.76	101	3.98	106	4.17	1.53	3.37	T1, T2	A
MP12-6	12	6	151	5.94	51	2.01	94	3.70	100	3.94	1.80	3.97	T1, T2	A
MP12-6II	12	6	151	5.94	65	2.56	94	3.70	100	3.94	1.85	4.08	T1, T2	F
MP12-6.5	12	6.5	151	5.94	65	2.56	94	3.70	100	3.94	1.95	4.30	T1, T2	F
MP12-7a	12	7	151	5.94	65	2.56	94	3.70	100	3.94	2.30	5.07	T1, T2	F
MP12-7	12	7	151	5.94	65	2.56	94	3.70	100	3.94	2.15	4.74	T1, T2	F
MP12-7II	12	7	151	5.94	65	2.56	94	3.70	100	3.94	2.10	4.63	T1, T2	F
MP12-7S	12	7	151	5.94	65	2.56	94	3.70	100	3.94	2.05	4.52	T1, T2	F
MP12-7.2	12	7.2	151	5.94	65	2.56	94	3.70	100	3.94	2.15	4.74	T1, T2	F
MP12-7.5	12	7.5	151	5.94	65	2.56	94	3.70	100	3.94	2.20	4.85	T1, T2	F
MP12-8	12	8	151	5.94	65	2.56	94	3.70	100	3.94	2.30	5.07	T1, T2	F
MP12-8S	12	8	151	5.94	65	2.56	94	3.70	100	3.94	2.25	4.96	T1, T2	F
MP12-9	12	9	151	5.94	65	2.56	94	3.70	100	3.94	2.45	5.40	T1, T2	F
MP12-9S	12	9	151	5.94	65	2.56	94	3.70	100	3.94	2.40	5.29	T1, T2	F
MP12-10	12	10	151	5.94	65	2.56	111	4.37	116	4.57	2.75	6.06	T2	F
MP12-10II	12	10	151	5.94	98	3.86	94	3.70	100	3.94	3.05	6.72	T2	F
MP12-12a	12	12	151	5.94	98	3.86	94	3.70	100	3.94	3.60	7.94	T2	F
MP12-12	12	12	151	5.94	65	2.56	111	4.37	116	4.57	3.40	7.50	T2	F
MP12-14	12	14	151	5.94	98	3.86	94	3.70	100	3.94	3.70	8.16	T2	F
MP12-15	12	15	181	7.13	77	3.03	167	6.57	167	6.57	4.50	9.91	T3, T13	B
MP12-18a	12	18	181	7.13	77	3.03	167	6.57	167	6.57	5.50	12.12	T3, T13	B
MP12-18	12	18	181	7.13	77	3.03	167	6.57	167	6.57	5.30	11.67	T3, T13	B
MP12-20	12	20	181	7.13	77	3.03	167	6.57	167	6.57	5.40	11.90	T3, T14	B
MP12-22	12	22	181	7.13	77	3.03	167	6.57	167	6.57	5.70	12.57	T3, T14	B
MP12-26	12	26	175	6.89	166	6.54	125	4.92	125	4.92	7.60	16.75	T4, T13	B
MP12-26II	12	26	166	6.54	125	4.92	175	6.89	182	7.17	8.00	17.64	T32, T66	B
MP12-28	12	26	175	6.89	166	6.54	125	4.92	125	4.92	8.50	18.74	T4, T13	B
MP12-28II	12	26	166	6.54	125	4.92	175	6.89	182	7.17	9.00	19.84	T32, T66	B
MP24-3.5	24	3.5	185	7.28	73	6.3	70	2.76	70	2.76	2.60	5.73	TW3	G

Please browse www.maxtonpower.com for specification.

Care and Handling

1 Disassembly

Do not disassembly the battery , as its strong acid electrolyte may burn your skin or clothes.

2 Shorting

Do not short the battery, as it can burn out the connections and could damage equipment.

3 Disposing

Do not incinerate. Batteries may burst if thrown into fire.

4 Keep the battery clean

Wipe the battery with dry cloth or , if necessary, use water dampened cloth. Never use oil, gasoline, thinner or other petrochemicals.

5 Do not use in totally sealed case or container

If the battery is used in a totally sealed case or container, it can fill with the gases generated during overcharging. In the worst case, the container may explode because the internal pressure might exceed the strength limit of the container or from an ignition of hydrogen gas in the event that there is an internal spark of flame.

6 If the battery is broken

If the battery is accidentally broken and electrolyte (sulphuric acid) leaks out, wipe it up with a cloth, neutralize the acid with some available alkaline substance such as ammonium solution, baking powder (sodium hydrogen carbonate) and so on.

In the event electrolyte contacts skin, immediately flush with water and consult a doctor.