圣码特能源
ZMARTEC

Zmartec Motorcycle starter battery

zmartec

motor cyele starting

battery

Technical advantage - supports ultra-high rate discharge

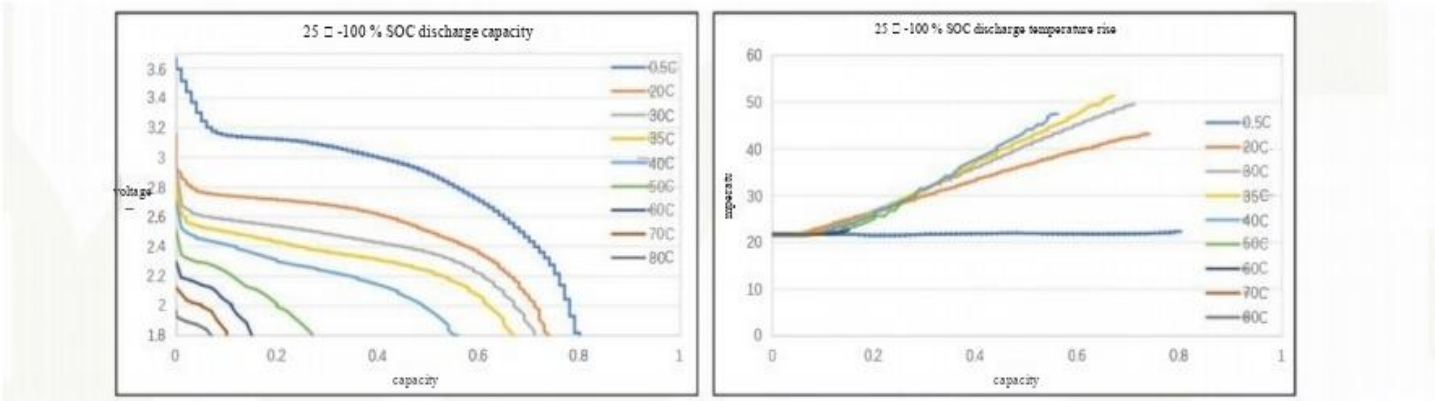
It supports short-term ultra-high current output, and the battery maintains high efficiency even under extreme operating conditions of 70C, with performance indicators reaching the industry-leading level

Normal temperature rate discharge

Test procedure: 1) Under the condition of 25±2℃, initially charge the sample at a constant current of 0.5C until it reaches 3.7V, then switch to constant voltage charging until the current drops to 0.05C and then stop charging;

2) Leave it open-circuited for 0.5 hours, then discharge it at 0.5C/20C/30C/35C/40C/50C/60C/70C/80C respectively until it reaches 1.8V.

Judgment criteria: 350 capacity ≥ 60% * 0.50 capacity, 60C discharge time ≤ 5s



Sample ID	Capacity / Ah								Capacity retention rate (%)								test result
	0. 5C	20C	30C	35C	40C	50C	60C	70C	0. 5C	20C	30C	35C	40C	50C	60C	70C	
1#	0. 80	0. 74	0. 71	0. 67	0. 56	0. 27	0. 15	0. 10	100%	92. 5%	88. 8%	83. 8%	70. 0%	33. 8%	18. 8%	12. 5%	Pass

Technical advantage - its cycle life is 10 times that of lead-acid batteries

It can withstand more than 3,000 cycles at 1C/1C, and more than 1,000 cycles of rapid charging and discharging at 3C/3C. Lead-acid batteries generally have around 300 cycles at room temperature. Sodium-ion batteries have 10 times the number of cycles as lead-acid batteries

18650 ultra-high rate sodium-ion battery cell

- At room temperature, it can withstand ≥3000 cycles at 1C/1C, ≥1000 cycles at 3C/3C fast charging and discharging, and can be used in an ultra-wide temperature range (-40°C to 80°C)

- It can maintain continuous discharge at 35°C at room temperature, with performance at low temperatures far surpassing that of lithium and lead-acid batteries. Its capacity retention rate is ≥85% at -20°C and ≥65% at -40°C

- No fire or explosion occurred during tests such as overcharging, short circuit, and compression

- The product has passed the testing and certification according to the group standard/T-CNESA1006-2021 "General Specification for Sodium-Ion Batteries"

Technical advantage - resilient to high temperatures

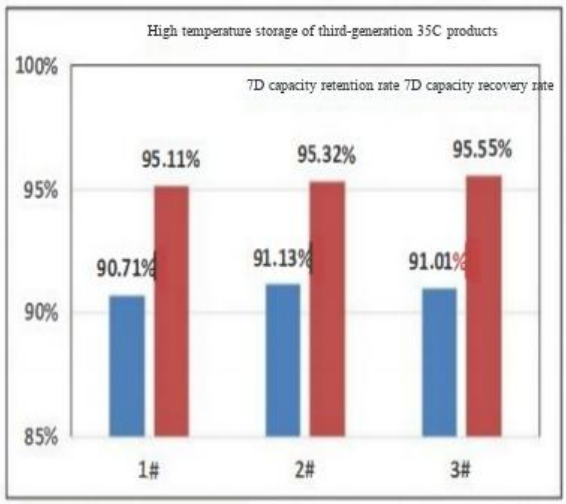
The self-developed 18650 battery cell maintains a capacity retention rate of over 91% even after being stored at a high temperature of 65℃ for 7 days, demonstrating stable and reliable performance

High-temperature storage

Test procedure: 1) Under the condition of 25±2℃, first charge the sample at a constant current of 0.5C until it reaches 3.7V, then switch to constant voltage charging until the current drops to 0.05C and then stop charging;

2) Place the open-circuited battery cell at 60±2℃ for 7 days, then discharge it to 1.5V at 0.5C after returning to room temperature; after charging the battery cell at the standard rate of 0.5C, discharge it again to 1.5V at 0.5C.

Judgment criteria: Maintain capacity ≥ 85% of initial capacity; recover capacity ≥ 90% of initial capacity



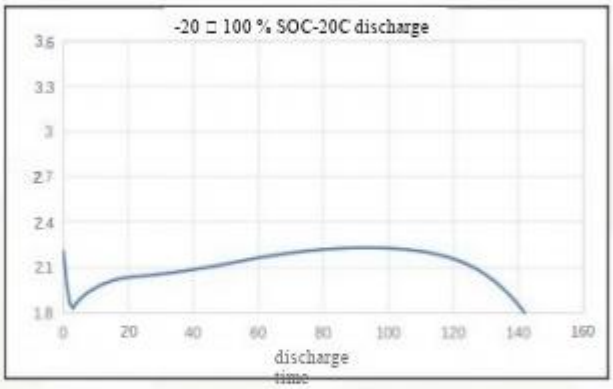
Sample Number PAS	Capacity (Ah)			ratio		Test results
	Initial capacity	maintain capacity	Restore capacity	capacity retention rate	Capacity recovery rate	
1#	0.8297	0.7526	0.7891	90.71%	95.11%	Pass
2#	0.8254	0.7522	0.7868	91.13%	95.32%	Pass
3#	0.8331	0.7582	0.7960	91.01%	95.55%	Pass
Average Average	0.8294	0.7543	0.7906	92.16%	95.33%	

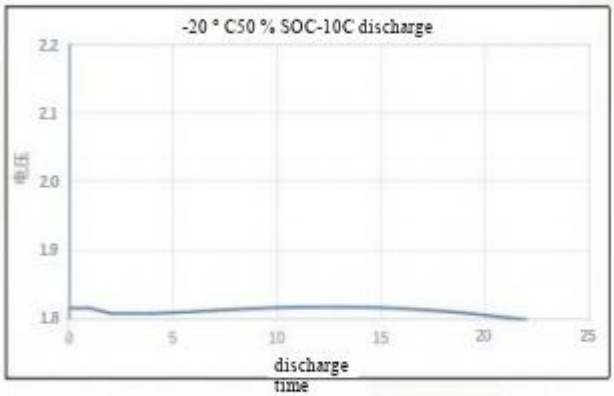
Technical advantage - resilient against severe cold

Under low temperature conditions in winter, at -20℃ and -30℃, the battery can stably discharge electricity at different rates, meeting the instantaneous high-power requirements of various devices

Low temperature -20 □ discharge

Test steps: 1) Under the condition of 25 ± 2C, first charge the sample with a constant current of 0.5C to 100 % S0C and 50 % SOC, then switch to constant voltage charging to 0.05C and stop charging ; Place the battery cells in the test box at 20 ° C (1 ° C) until they are completely at the set temperature, and discharge them at a constant current of 20C / 22C / 23C / 24C / 25C / 26C to 1.8V. Test results: 100 % S0C-20C discharge: 50 % S0C-10C discharge:

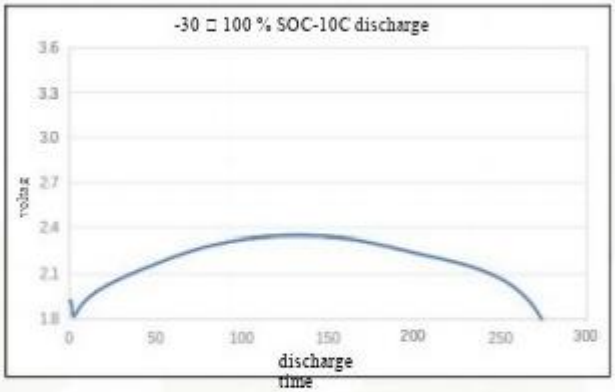


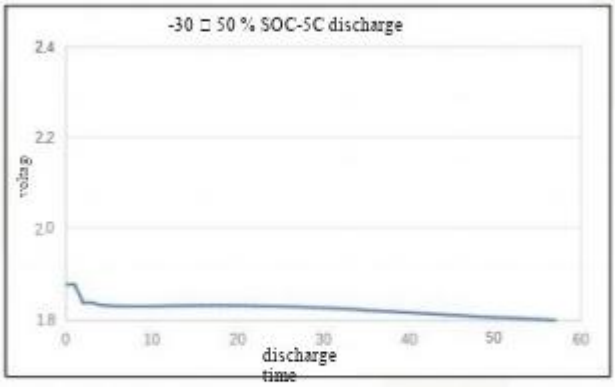


Test temperature / □	Cell capacity / SOC	magnification	Initial discharge capacity (mAh)	Discharge capacity (mAh)	Discharge time (s)	Capacity release rate
-20	100%	20C	0.8309	0.6900	142	83.04%
	50%	10C	0.5009	0.0666	22	13.29%

Low temperature -30 ° C discharge

Test steps: 1) Under the condition of 25 ± 2C, first charge the sample with a constant current of 0.5C to 100 % S0C and 50 % S0C, then switch to constant voltage charging to 0.05C and stop charging: 2. Open circuit and remove 0.5, then place it in the -30C test box for 6H, until the entire cell is completely at the set temperature, and discharge it with a constant current of 9C / 10C / 11C / 12C / 14C to 1.8V. Test results: 100 % -10G discharge, 50 % S0C-50 discharge:





Test temperature / □	battery cell capacity / SOC	magnification	Initial discharge capacity (mAh)	Discharge capacity (mAh)	Discharge time (s)	Capacity release rate
-30	100%	10C	0.8224	0.6645	274	80.80%
	50%	5C	0.4958	0.0855	57	17.24%

Starting sodium-ion battery vs. lead-acid battery

project	sodium-ion battery	lead-acid battery	remark
cycle life	>3000 times	>300 times	The lifespan of a sodium battery, when fully charged and discharged, is 10 times that of a lead-acid battery
low-temperature performance	Good, supports high-current discharge at 40℃	Generally, only a small amount of energy can be released below 0℃	The rate performance of sodium batteries in low-temperature environments is superior to that of lead-acid batteries
high-temperature performance	"Good, supports normal use at 80° C"	Generally, it is prone to bulging	Sodium batteries exhibit superior discharge performance under high-temperature conditions
Storage life	Monthly self-discharge rate (s2%)	Monthly self-discharge ≥ 10%	Sodium batteries can store energy for a longer period of time. After being stored for a long time, they can recover their capacity by charging
fast charging	Supports 5C high-current fast charging	It does not support fast charging with a current greater than 1C	Sodium batteries support fast charging
high current discharge	Supports instantaneous discharge at 70C and continuous discharge at 35C	Does not support high-current discharge of ≥30C	Sodium batteries exhibit superior discharge performance
Weight energy density	>120Wh/kg	≤40wh/kg	The weight energy density of sodium batteries is more than three times that of lead-acid batteries
Volumetric energy density	>260Wh/L	≤130wh/L	The volumetric energy density of sodium batteries is more than twice that of lead-acid batteries

Characteristics of sodium-ion motorcycle starter battery

The motorcycle sodium-ion starter battery series boasts exceptional performance. Utilizing a self-developed polyanion system cell, it offers safety, reliability, and superior performance, catering to the needs of various motorcycle models. Compared to traditional starter batteries, it exhibits significant improvements in terms of service life, safety, environmental friendliness, and starting performance. The product has successfully undergone various tests and export certifications, ensuring precise performance at the customer end and eliminating any concerns about application.

Main Features

- Wide temperature range, worry-free startup from -40° C to 80° C.
- The battery has low self-discharge, with a monthly discharge loss of less than 29% under normal storage conditions, and can be recharged at any time.
- High safety, no fire, no explosion, flame retardant, anti-vibration, high protection level.
- High ignition efficiency, high instantaneous starting discharge rate; 0.5-second ignition, low starting energy consumption, fuel saving, and full combustion
- Lightweight, with a weight only 1/3 of that of an aluminum acid battery of the same volume, making it convenient for transportation; the battery is free from heavy metal pollution, radiation, and is energy-saving and environmentally friendly.
- Good rate capability, the battery can be charged and discharged at high rates, charging to 80% in 5 minutes, and the discharge rate can reach up to 100C
- Long lifespan, capable of being activated up to 30,000 times or more。

Specifications for 12V series motorcycle sodium-ion starter batteries

Product Model	YTX4A	YTX5A	12N5L	12N6.5L	YTX7A	YTX9A	12N9L	YTX12A
Sodium battery capacity	1.7Ah	2.55Ah	2.55Ah	2.55Ah	3.4Ah	4.25Ah	4.25Ah	5.1Ah
Replace lead-acid capacity	4Ah	5Ah	5Ah	6.5Ah	7Ah	9Ah	9Ah	12Ah
rated voltage	12V	12V	12V	12V	12V	12V	12V	12V
Instantaneous maximum discharge current	102A	153A	153A	153A	204A	255A	255A	306V
Charging cut-off voltage	14.8V	14.8V	14.8V	14,8V	14.8V	14.8V	14.8V	14.8V
Discharge cut-off voltage	7.2V	7.2V	7.2V	7.2V	7.2V	7.2V	7.2V	7.2V
S (string) P (parallel)	4S2P	4S3P	4S3P	4S3P	4S4P	4S5P	4S5P	4S6P
Product size (mm)	113*69*86	113*69*107	120*61*126	138*65*103	150*86*94	150*86*105	137*77*134	150*86*131
Protection level	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65