HTB --- 12V/6V High Temperature Long Life Deep Cycle Gel Battery

New!

--- Innovative Power Solution For High Temperature and Deep Cycle Application

How HTB Battery come out?

Since 2003, CSBattery start the research and produce sealed free maintenance AGM and GEL storage batteries. Our batteries are always in the process of innovation according to market and environment: AGM battery→GEL battery→High Temperature Long Life Deep Cycle GEL battery.

Since 2010, we have more and more clients from Africa and Middle east market, also according to global climate become warmer and warmer, especially in Africa and Middle east, more and more application need the long life storage battery working in high temperature, but normal battery recommended working temperature is 25℃, every 10℃increasing in operating temperature will cause the battery life reduce 50%, because high temperature speed up the corrosion of lead plates, reduce the conductivity and durability. To solve this problem, after 2years research, CSBattery research team successfully made it. We produce new corrosion-resistant alloy and optimize grid structure to improve battery capacity of corrosion-resistant, extend its cycle life when work in high temperature area. We give it name “High Temperature Long Life Deep Cycle Gel Battery”, mixed the newest innovative technology of complex gel, Super-C, anti-high temperature material, corrosion-resistant alloy and so on.

Why HTB battery own super anti-high/low temperature performance?

1. HTB series adopts super corrosion-resistant alloy and unique patented grid structure, so can improve the lead plates corrosion-resistant performance in high temperature.

2. It adopts special positive negative lead plates ratio and unique nano gel electrolyte, so can improve battery overpotential of hydrogen evolution effectively and high reduce the water loss in high temperature environment.

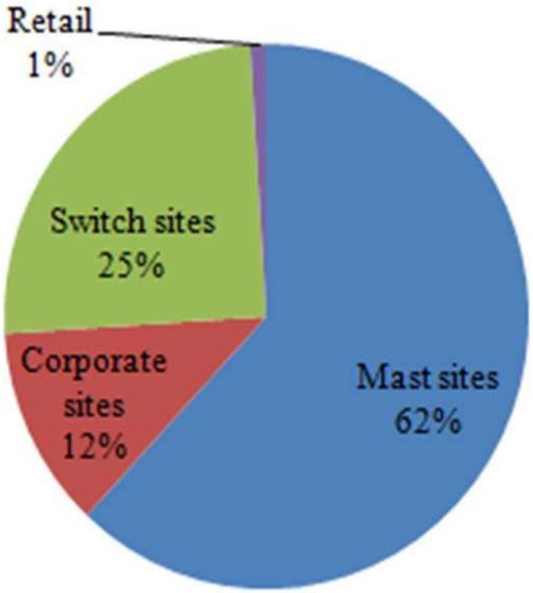
3. Its paste formula is added anti-high temperature expanding agent, so can work continuously in high temperature environment.

4. HTB's shell adopts anti-high temperature ABS material, so the battery inside will not be over heat lead to water loss because of high temperature environment, ensure the battery super long life and the shell will not swell even use in extreme high temperature area.

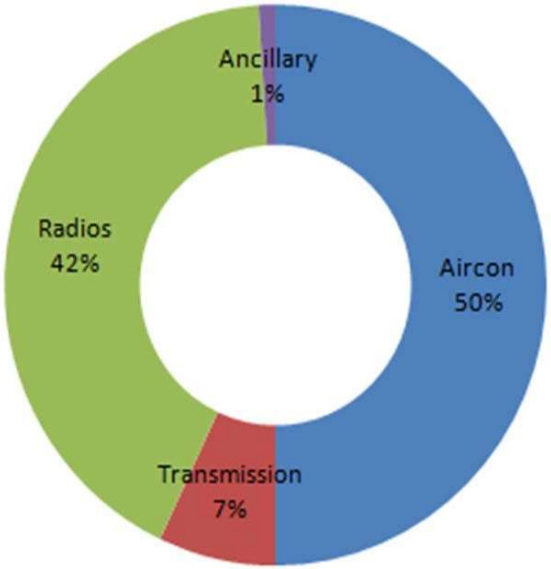
5. HTB series adopts patented gel electrolyte by nano-meter fumed silica, which advantage is high heat capacity and excellent heat release performance, can avoid the thermal runaway problem of normal battery, and discharge capacity can increase by over 30% in low temperature area. So HTB battery can work very well in severe environment between -40℃-65℃.

6. Its formula is added special super expanding agent which ensure battery discharge capacity is higher than other normal battery when work in low temperature, thus even HTB battery work in -40℃ area, it can work stable and continuously.

Energy consumption of cooling system



~87% of a CSP's energy is used by Network



~50% of total site energy consumption is occupied by Aircon

Reduce the energy consumption of Aircon is key factor for Telecom industry's energy saving and emission-reduction

Working environment analysis for BTS equipment

☐ wireless equipment: Operating temperature: 5℃～55℃,
Allowed Max working temperature: 50℃

☐ Transmission equipment: Operating temperature: 0℃～45℃
normally work between 30℃～60℃

☐ Power Supply: SMPS operating temperature -5℃～40℃
☐ A/C equipment: Max allowed operating temperature: higher than 50℃

☐Normal Battery: Suggested working temperature 25℃,every 10℃ increasing in operating temperature will cause battery life reduce 50%

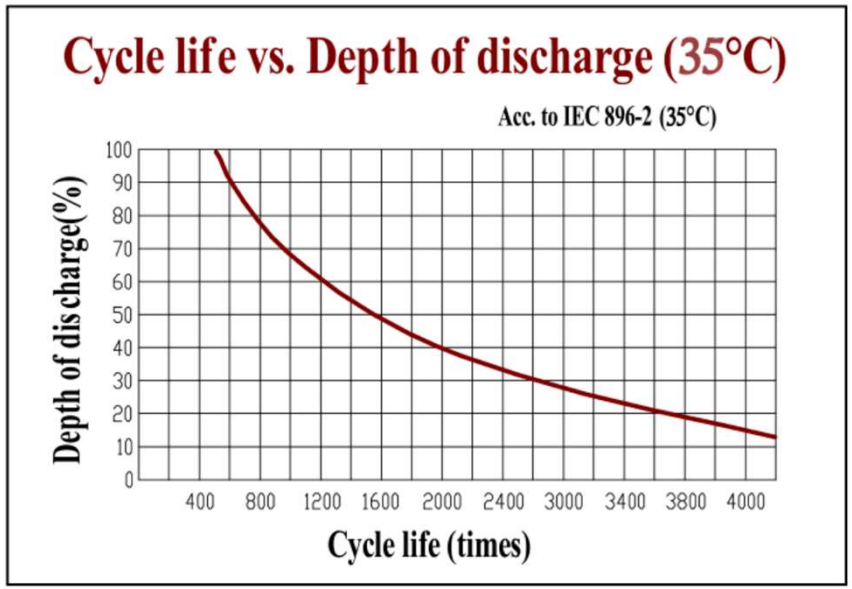
Features of HTB High Temperature Deep Cycle Gel Battery

- Design for high temperature application (35 – 45degC). Help to reduce energy consumption

- Long life design for both floating and cyclic application.

- Excellent charge acceptance capability. It is applicable for using at PSOC (partial state of charge).

- Perfect to be applied to renewable energy system or hybrid power system at tough condition.



Energy consumption saving without impacting battery life

Traditional normal battery

Innovative HTB battery

Commercial Superiority – Floating application

CapEx (Capital Expenditures) Saving Calculation

Site Type	Scenario	CapEx Calculation				
		Battery Cost	Cooling Facitlity Cost	Installation Cost	Subsidy	Tax
Traditional operating mode	Floating application in Europe, Air Conditioning is required (2*12V200Ah)	Approx. USD400	Approx. USD800	Considered as the same	Considered as the same	Considered as the same
HTB battery operating mode	Floating application in Europe, fan cooling is required (2*12V200Ah)	Approx. USD500	Approx. USD100	Considered as the same	Considered as the same	Considered as the same
CapEx Saving by using HTB battery		**USD600 per site**				

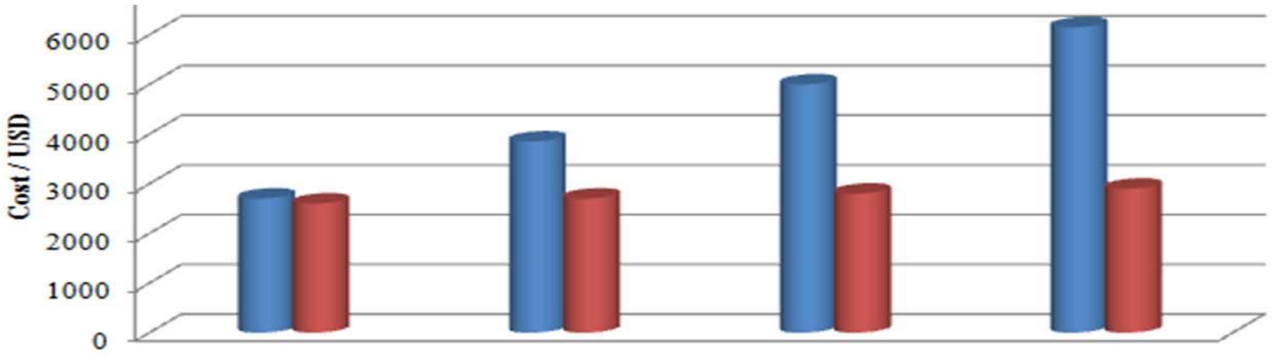
Notes:

1.The installation cost, subsidy are considered as the same. But actually these cost in traditional operating mode is even higher since the air conditioning is required to be installed.

Sustainable Cost Savings

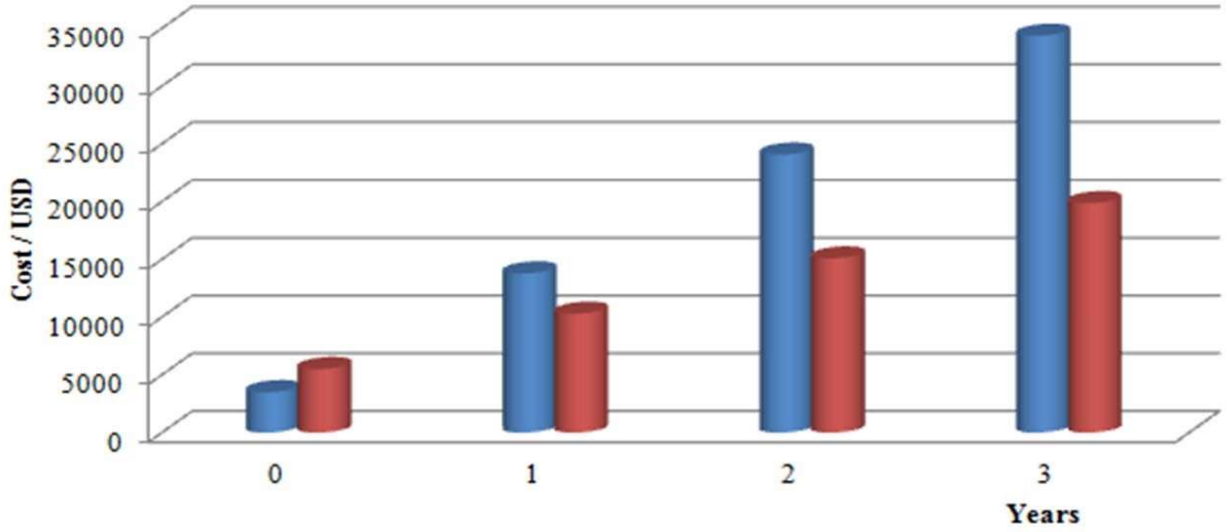
1.5kW on-grid site in Spain with Traditional VRLAbattery

1.5kW on-grid site in Spain with CSBattery HTB solution



7.5kW off-grid site in India with Traditional VRLAbattery

7.5kW off-grid site in India with CSBattery HTB solution



Why HTB battery own the longest life among all VRLA batteries?

1. HTB series adopts unique grid structure, special super corrosion-resistant alloy and unique active material formula, which can improve the efficiency, so HTB battery recover performance is excellent after deep discharge even discharge to empty, also with the advantage of high durability, enough capacity and long cycle life.

2. All in HTB battery adopts high pure raw materials since original, so its self discharge rate is very low below 3% every month.

3. The electrolyte adopts low density gel electrolyte and add particular electrolyte additive, so can lower the corrosion of lead plates by electrolyte, reduce the problem of stratification of electrolyte density, result in to improve the battery charge receive capacity and over discharge performance, finally can extend the battery cycle life on a higher level.

4. HTB battery adopts unique radial grid structure and super thick lead plates, in order to extend battery cycle life. Enhancing lead plates thickness ensure that battery can realize self protect of over discharge so can avoid battery over discharge.

5. It adopts patent technology of high strength tight assemble and 4BS lead paste, so can extend the battery cycle life obviously.

6. It adopts battery formation innovative technology, so can reduce of the possibility of lead plates secondary pollution and improve the battery consistency.

7. HTB battery adopts gas recombination technology and high reliable seal technology, ensure battery own super high seal reaction efficiency, no acid fog spill and no pollution.

Main problem of normal battery

◆positive plate: active decline

- Active material soften → Active material efficiency decrease → Capacity decrease
- Plate utility Efficiency decrease → Active material efficiency decrease
- Grid Corrosion → Plate extension → loosen contact between active material and grids

◆negative plate: sulphation

- sulphation → Capacity decrease
- Active material efficiency decrease → Capacity decrease

◆electrolyte: dry out

- Water loss → Resistance between plates increase
- Water loss → Stronger electrolyte → Positive plate corrosion → Capacity decrease → Battery failure
- Electrolyte leakage → Battery failure

◆separator failure

Lower pressure and lost contact to plates due to leak of water

- → Capacity decrease → Battery failure
- → Dendrite penetrate → Battery failure

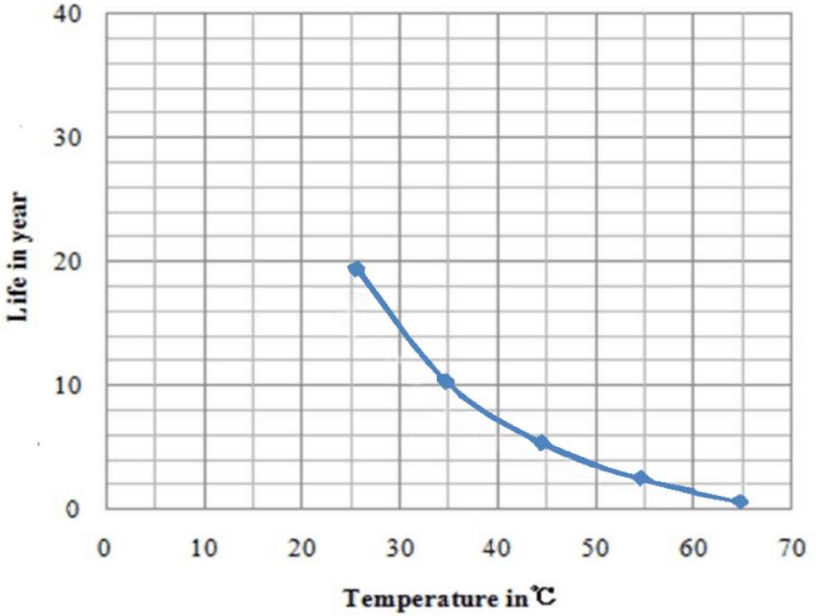
◆container, valve aging

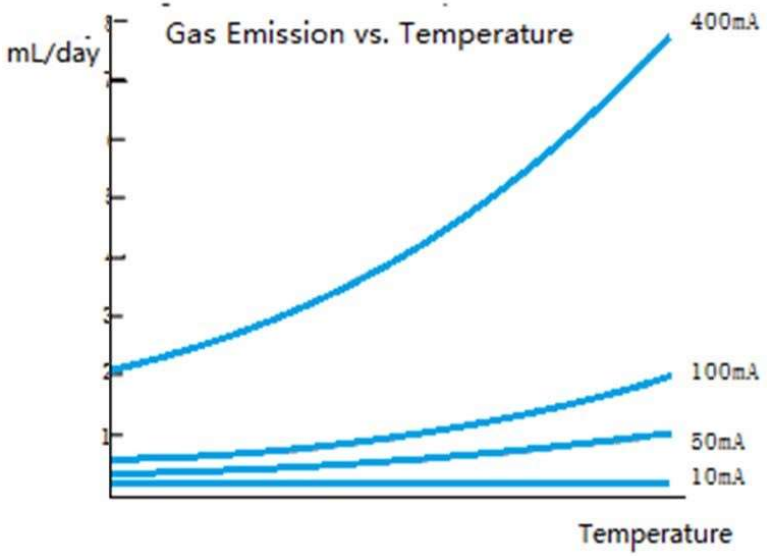
Seal failure → Air enter (absorb O_2) → Negative plate capacity decrease → Battery failure

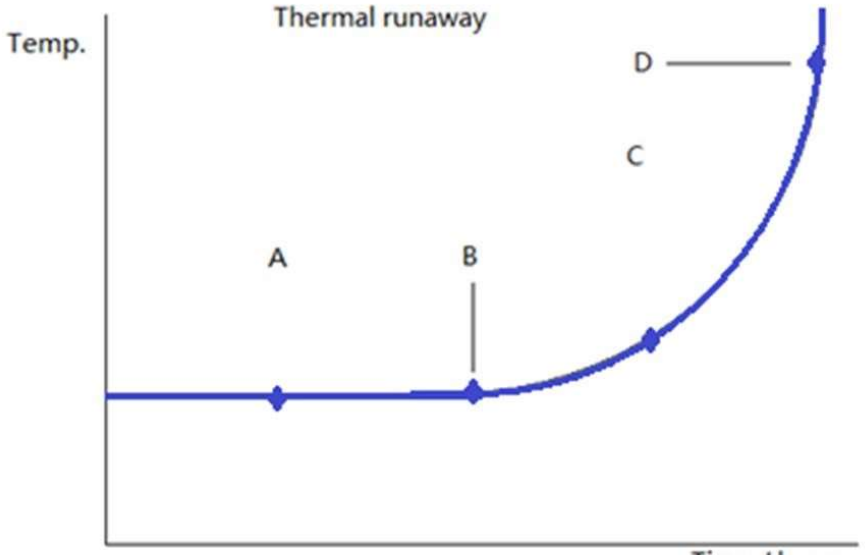
thermal run away

Impact factors of HTB Battery

- Positive grid erosion
- Water loss of battery
- Thermal runaway
- Sulphation of negative plate

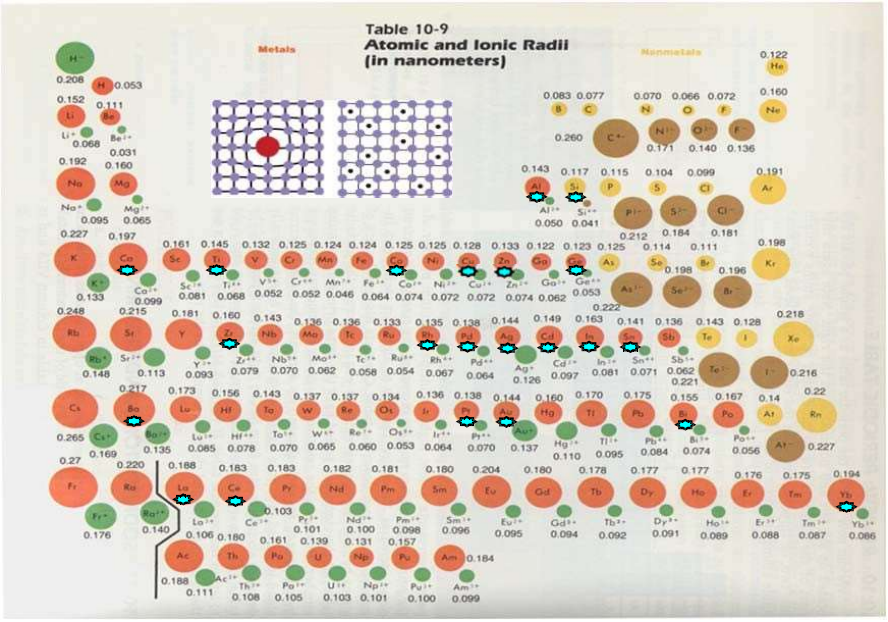






Core technology 1– positive grid alloy

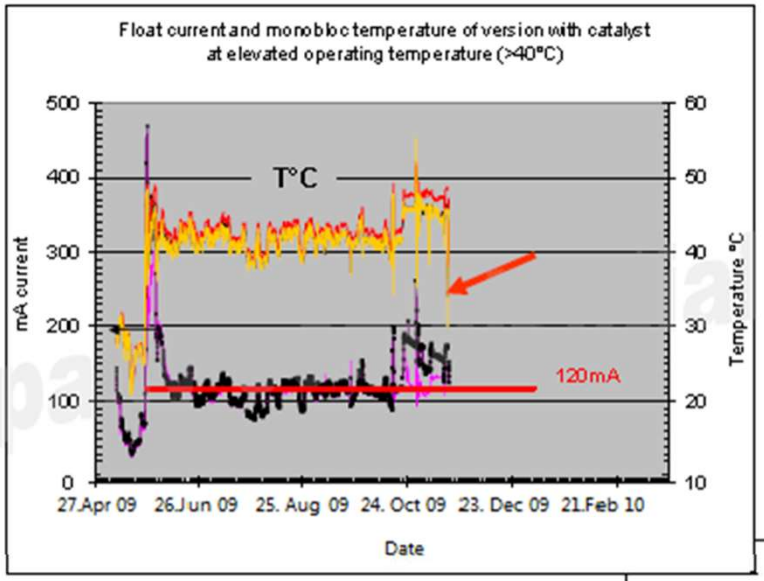
Special alloy innovation in superior anti-erosion performance （Patent）



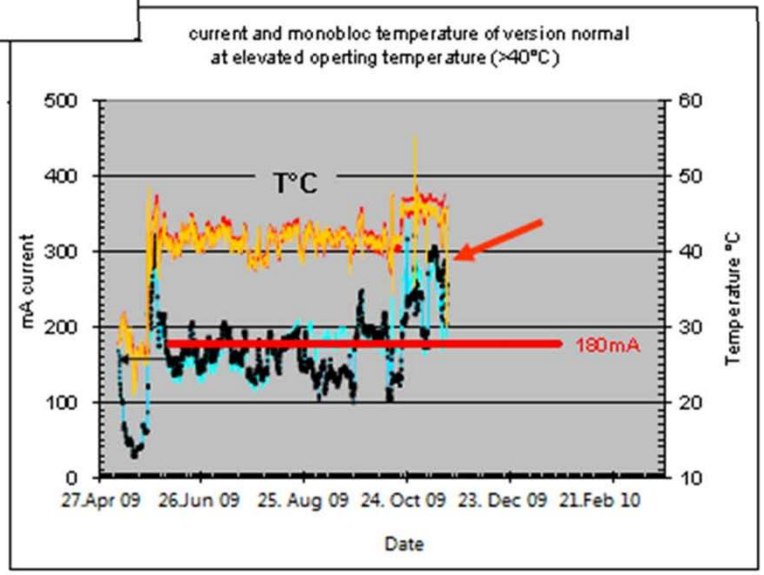
Appearance of different grid alloy after erosion

Research finds: Anti-erosion ability will be intensified after adding some elements

Special catalyst valve applied to reduce secondary reaction and protect Negative



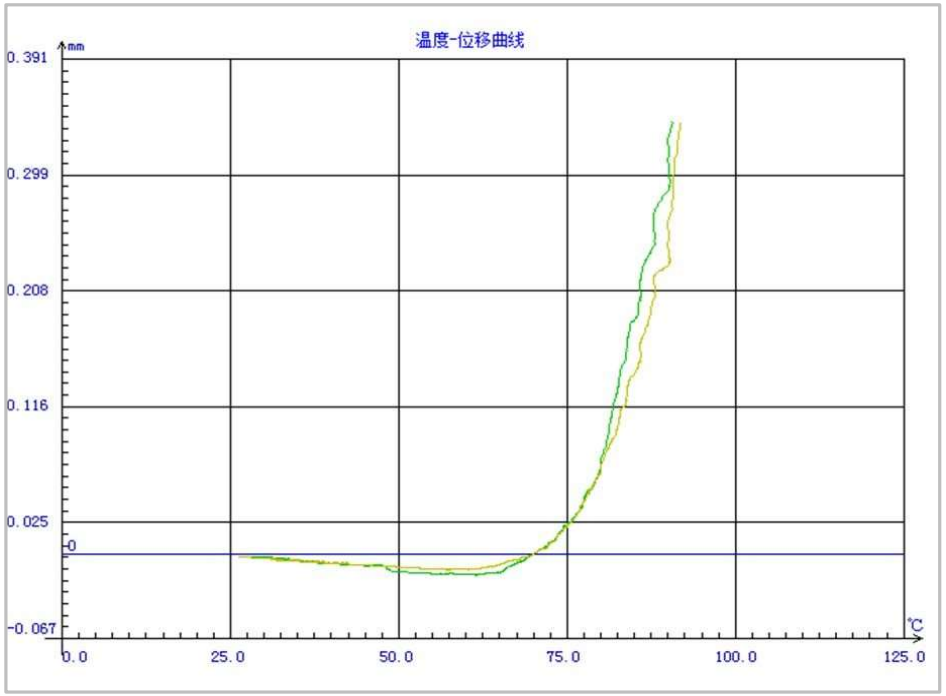
Slow down
of float current rise



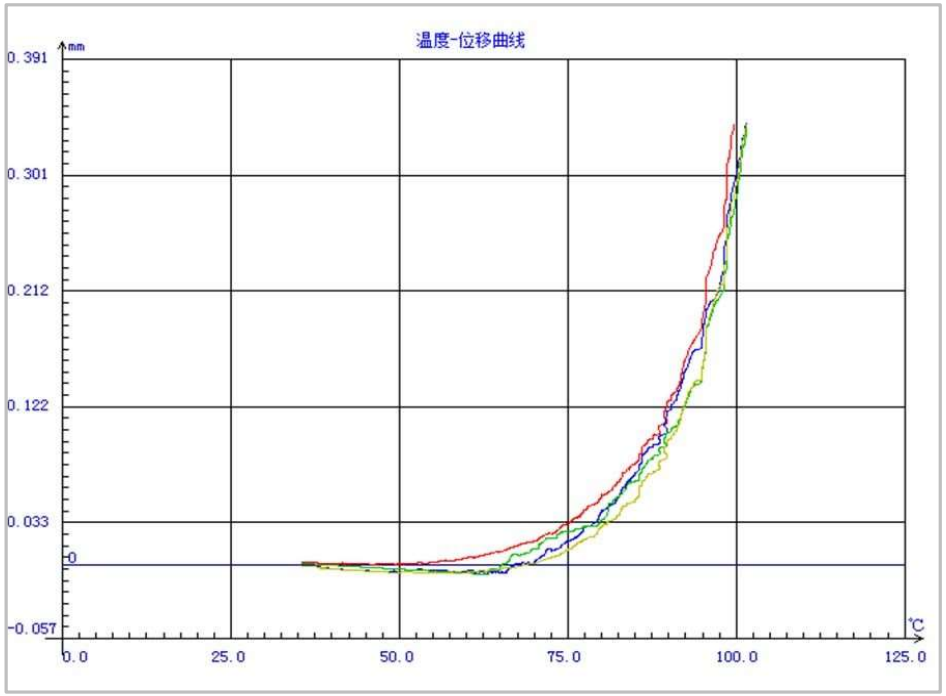
Float Current at 40℃:
Normal Batt: 180mA
HTB Batt: 120mA

Innovation of high temperature case material（Patent）

Curves of heat deformation test



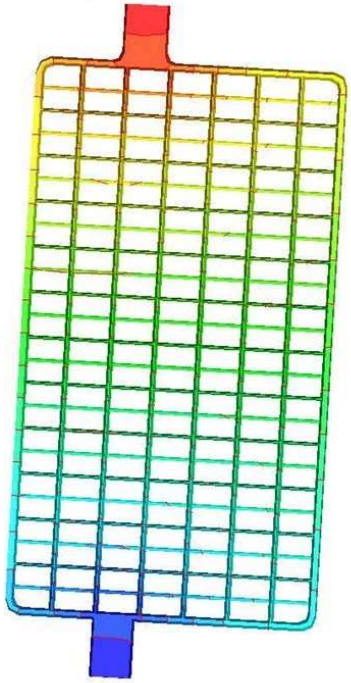
Normal plastic material
(deformation: at 90℃)

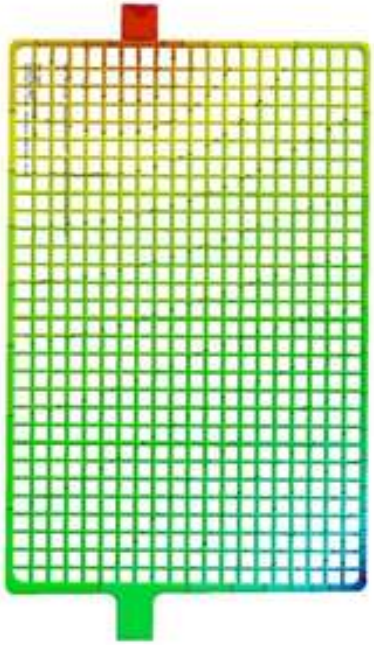


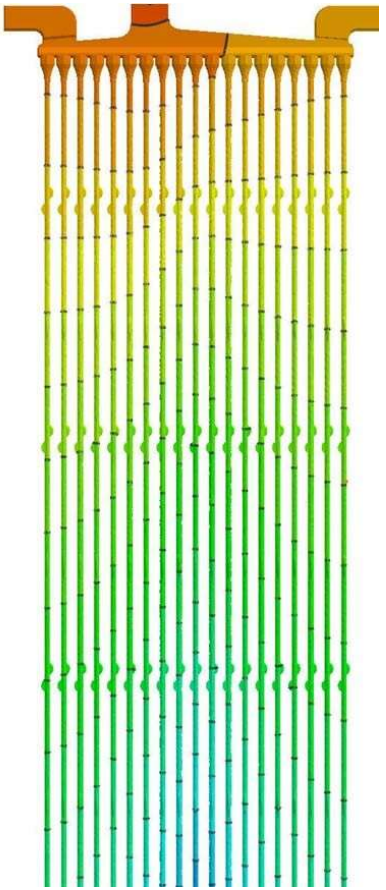
High temperature material
(deformation: at 100℃)

Core technology 4– grid design

Special grid structure design



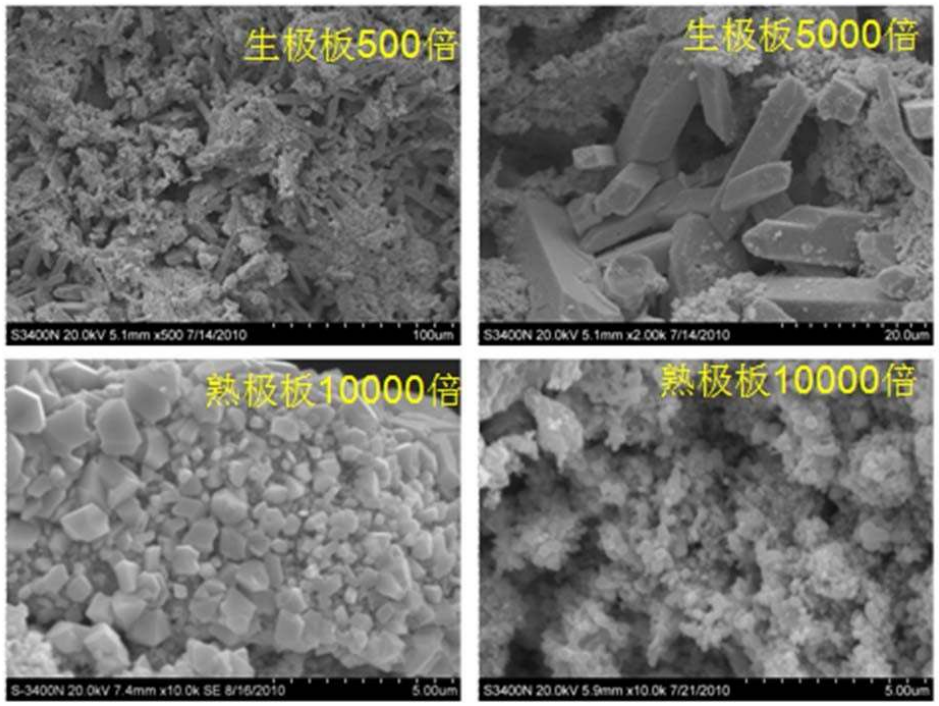


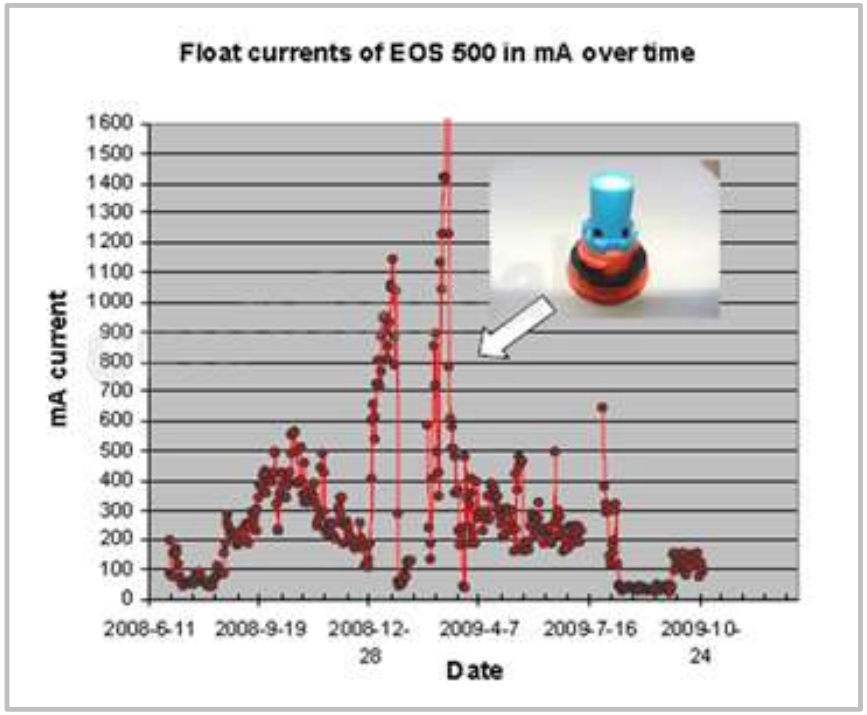


Less voltage drop, high specific surface,
good cyclic performance, charge acceptance

Core technology 5– negative active material

Prevention for negative plate sulphation



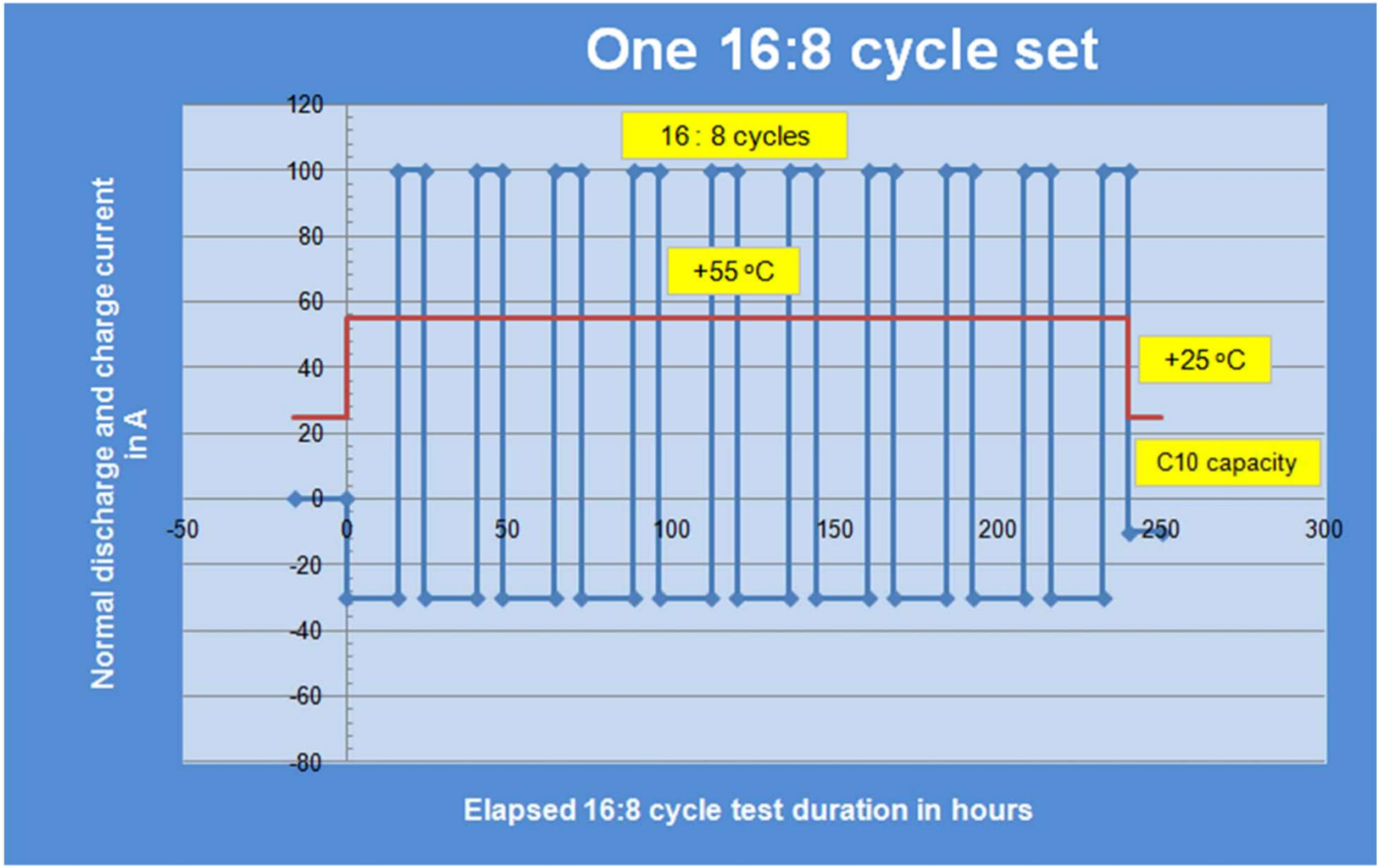


Enhance anti sulphation ability by changing active material component

Reduce recombination happened on negative plate

Test Result of HTB Battery 1

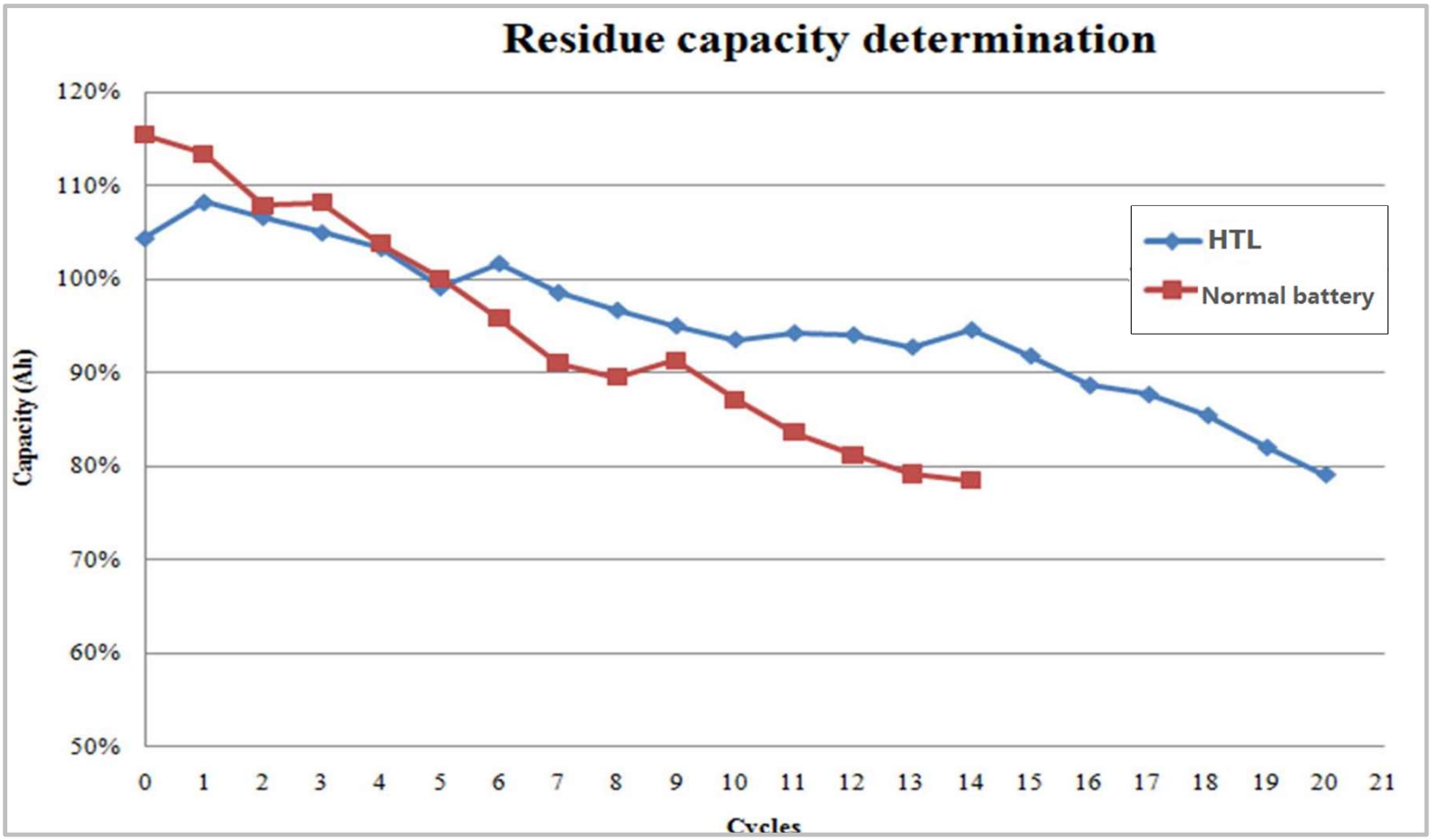
Test Senario



55 ℃, 80% DOD, 16 hours discharge, 8hours recharge time

Test Result of HTB Battery 2

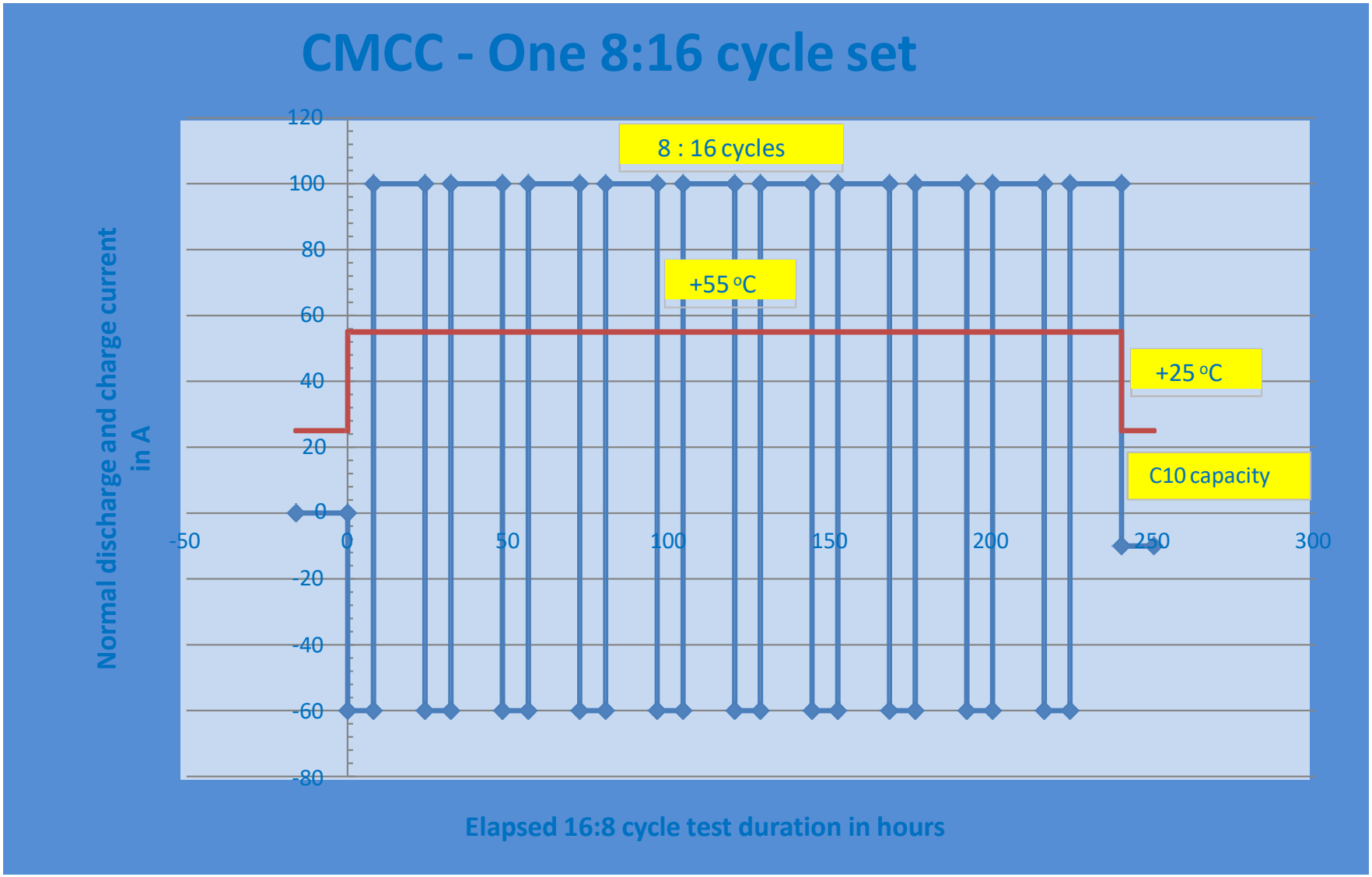
High temp. accelerate test



1 cycle=at 55 ℃, 10 times of 80% DOD , 16 hours discharge, 8hours recharge time+ at 25℃, 1 time of 100% DOD capacity discharge test.

Test Result of HTB Battery 3

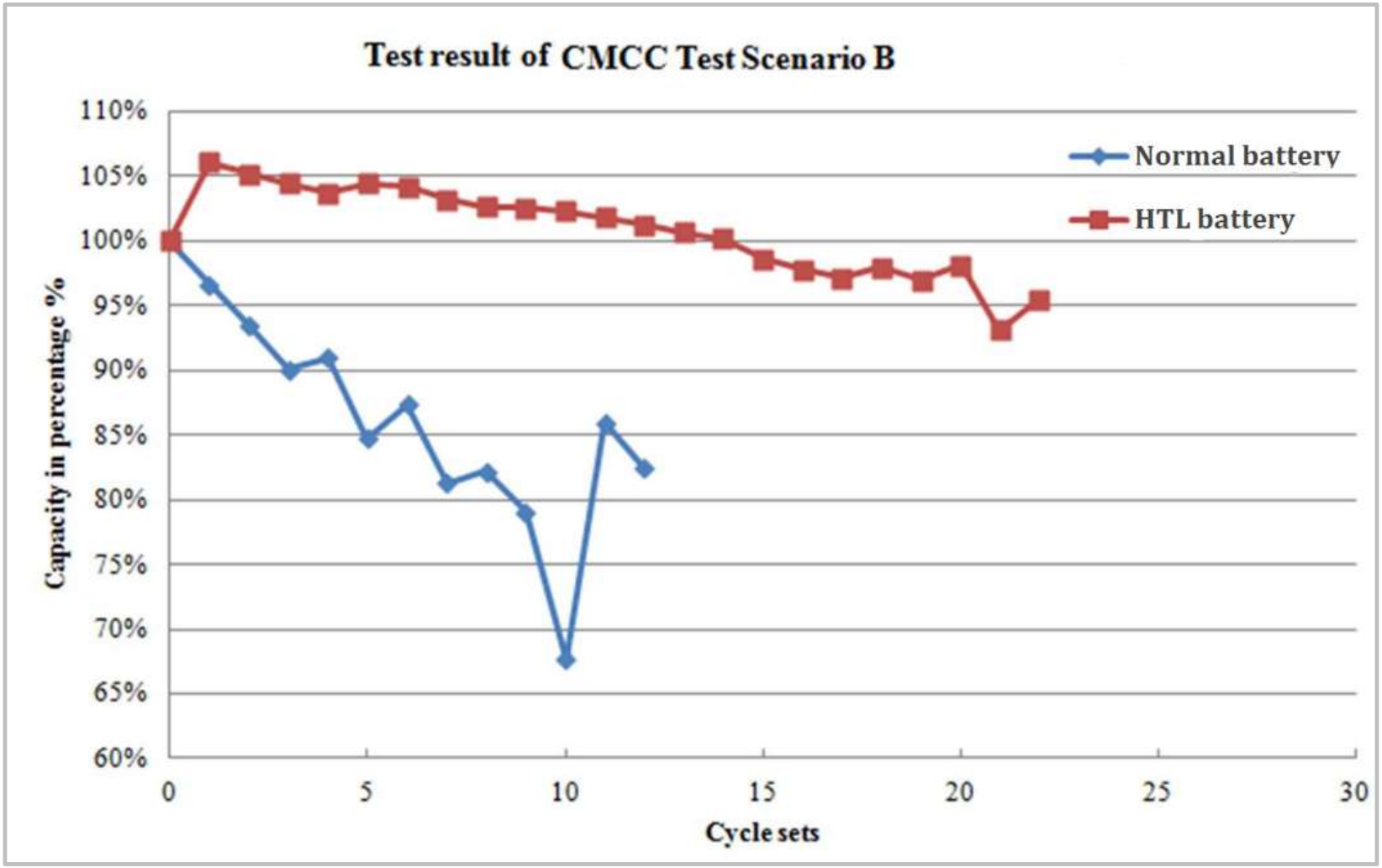
CMCC test Senario



55 ℃, 80% DOD, 8 hours discharge 16 hours recharge time

Test Result of HTB Battery 4

High temp. accelerate test



1 cycle=at 55 ℃, 10 times of 80% DOD , 16 hours charge, 8hours discharge time+ at 25℃, 1 time of 100% DOD capacity discharge test

Comparison of CSBattery HTB batteries, Regular GEL batteries and Regular VRLA batteries

Item		HTB	Regular GEL battery	Regular VRLA battery
Technologies		GEL	GEL	AGM
Expected service life (35℃)		15 years	10 years	7.5 years
Operating Temp.		-40℃ to 60℃	-20℃ to 40℃	-10℃ to 35℃
Initial Capacity		★★★	★★	★★
Internal resistance		★★★	★★	★★
High current performance		★★★	★★	★
Fast charge performance		★★★	★★	★
PSOC performance		★★★	★★	★
Water loss performance		★★★	★★	★
Avoid thermal runaway		★★★	★★★	★★
Cycle life	>80%DOD	★★★	★★	★
	<80%DOD	★★★	★★	★
Float life		★★★	★★	★


HTB13-70(12V70Ah/20HR)
High Temperature GEL Deep Cycle Battery


HTB12-150(12V150Ah/20HR)
High Temperature GEL Deep Cycle Battery
CAUTION


HTB6-420
6V420Ah/20HR
High Temperature GEL Deep Cycle Battery
CAUTION

Thanks!