

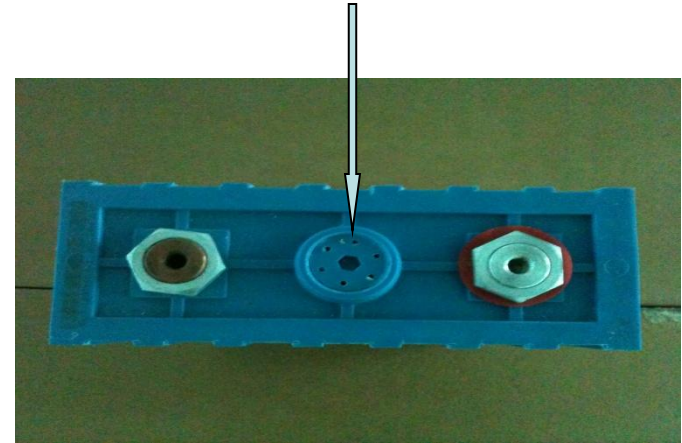


Characteristics and Advantages
of
GBS Lithium Ion Batteries

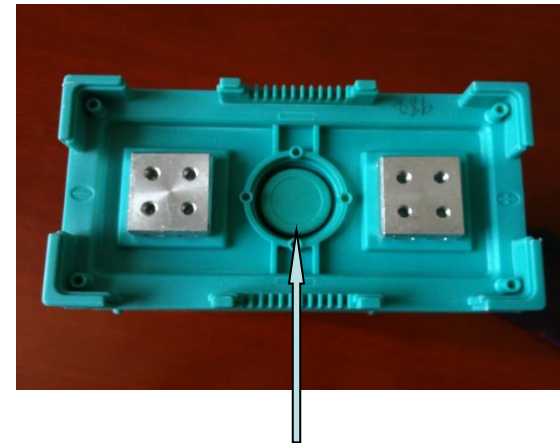
June, 2010

Comparison Of Safety Valve

Competitors use sandwich structure of a threaded cap/spring/metal plate as the safety valve. The design does not allow for reliable opening under extreme conditions, which may result in fire and explosion. Spring and metal plates may corrode over time and lose effectiveness.

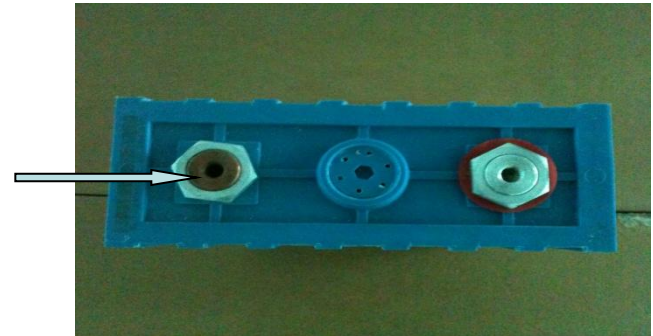


GBS cells use a patented latch design safety valve which pops open when internal pressure reaches a designed threshold. The reliability and durability of the safety valve is much improved. The cells do not catch fire or explode even in worst case extreme conditions, such as a steel rod piercing through the cell causing a full internal short.

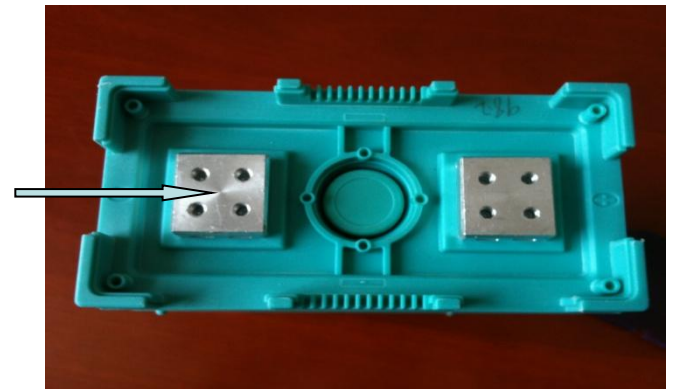


Comparison of Cell Terminals

Competitors use nuts to compress a seal between the terminals and the shell. The sealing capability degrades over time due to thermal cycles and may result in loss of electrolyte. The contact areas on the terminals are smaller by comparison, which may result in higher heat generation.

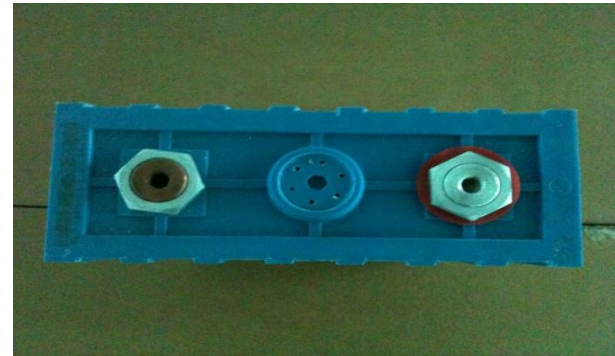


The terminals on GBS cells are molded to the shell. This eliminates the possibility of a bad terminal seal. The square terminal provided a larger contact area to prevent high contact resistance.

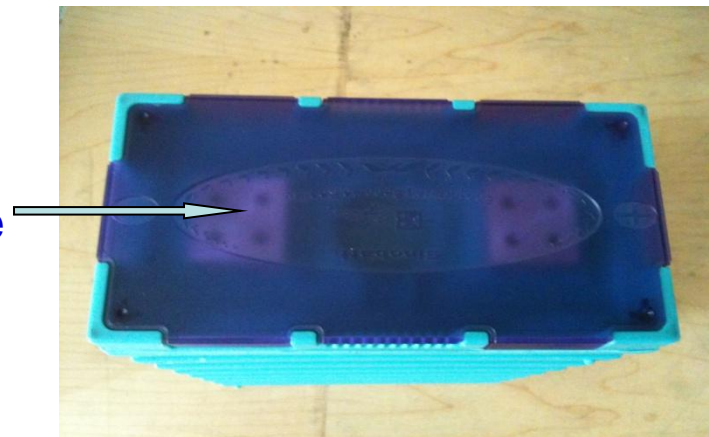


Comparison Of Cell Cover

Competitors have no battery cover which makes it more vulnerable to electrical shorts.



GBS cells come with covers which protects the terminals, jumpers, BMS boards from potential shorts and mechanical damage. The cover mounts flush with the top of the battery case.

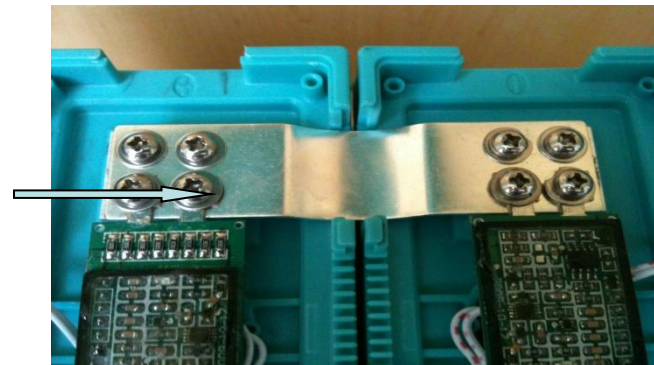


Comparison Of Jumper Connection

Competitors' cells use a single bolt for jumper connection. The connection could potentially become loose over time due to vibration. This could lead to high contact resistance, heat generation and in general is a safety risk. The jumpers are made out of unprotected copper which could corrode over time.



GBS cells use 4 screws or 4 rivets to secure the jumpers on the terminals. The connection is much more robust, and the contact area is maximized. These jumpers are made from silver plated copper for greater corrosion resistance and higher conductivity.



Comparison Of Packaging

Sky Energy and Thunder Sky cells have no alignment nubs, so they are difficult to be packaged. There are no air gaps on the side of the cells to allow proper air flow for cooling.



GBS cells have small nubs to allow for easy packaging, and prevents cells shifting after being strapped. There are air gaps on all sides of the cells to allow lateral air flow for cooling.

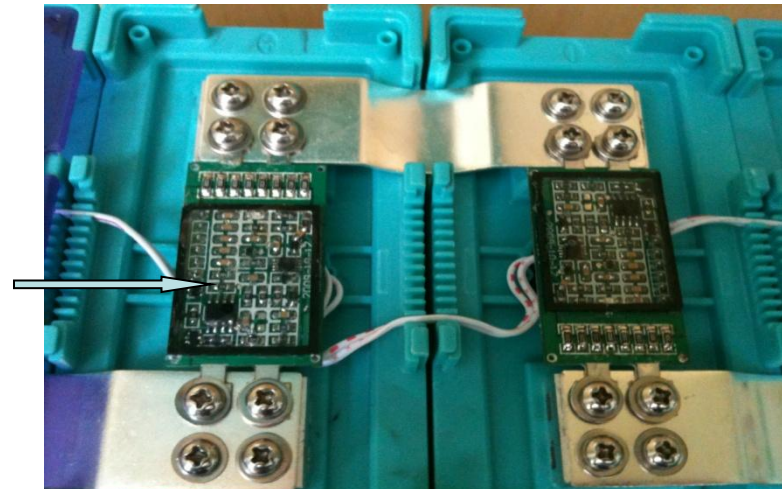


Comparison Of BMS Board Installation

Competitors' cells are not designed to easily accommodate BMS sampling boards.



GBS cells are designed to accommodate BMS sampling boards. The boards can be installed easily on the terminals (without removing the jumpers). There are comb slots to secure BMS wires.



Energy Density and Cycle Life

- 10-20% improvement in energy density compared to competitors
- Lab test data exhibited ~2000 cycles at 100%DOD!.

