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Author: Mr. Honghui Gu
China, ghhnuaa@163.com

# HIGH POWER LITHIUM SECONDARY BATTERIES

**Abstract**

Lithium-ion batteries, with their exceptional energy density and cycle life performance, are replacing other rechargeable battery systems in many applications. With the continued development of applications such as satellites, unmanned aerial vehicles and aircraft batteries, lithium-ion battery technology must continue to develop its high pulse power and high rate continue discharge performance aspects. The rate of the practice Li-ion batteries for space applicants are usually less than 1C, which can not afford to the high power load. Hence, it is necessary to develop high power Li-ion battery. While developing a cell with high rate performance characteristics, all aspects of the lithium-ion battery system are evaluated: anode material, cathode material, current collectors, electrolyte composition and separator. To improve the rate performance, the following strategies are often taken: firstly, reducing particle size or increasing surface area of active materials; secondly, lowing internal resistance including contact resistance between electrode materials and current collectors and between current collectors and cell case, particle and particle contact resistance within electrodes; finally, increasing conductivity of electrolytes especially at low temperatures. These strategies are quite effective in improving the rate considering the various charge transfer processes involved in charging and discharging. In this paper, three kind of high power Li-ion cells are proposed. The specific energy of prismatic high power 30Ah cells with LNCM and MCMB reached 140 wh/kg at 3C, and the cycle life was above 20000 cycles (20Based on the current research, Li-ion batteries with extremely high discharge, pulse and continuous power are manufactured. And the high power hermetically sealed cells will be the next research target.