

## SB LiMotive at the IAA 2009

September 2009

### **Lithium-ion technology for the automotive battery of the future**

- BMW to use SB LiMotive battery cells in its Megacity Vehicle
- Ground breaking for cell production in Ulsan, Korea
- Large-scale series production of lithium-ion battery technology for use in the automobile planned from 2011

SB LiMotive – the joint venture of Samsung SDI and Bosch – will supply BMW with lithium-ion battery cells. The German automaker will use them in the electric vehicles that are being developed for its "Megacity Vehicle" project and which are set to go into series production in the first half of the next decade. With this project, the German-Korean joint venture already counts a major automaker among its clients within the first year of SB LiMotive's founding.

#### **Lithium-ion technology as energy storage for the car of the future**

Nearly all automakers and suppliers agree: as energy storage for the electric drives of the future, a lithium-ion battery is the preferred technology. When compared to the nickel-metal hydride technology that has been used to date, lithium-ion technology provides improved power density. Moreover, thanks to a high nominal voltage, it also has a higher energy density. As a result, lithium-ion technology makes it possible to drive significantly longer distances without increased weight. Other benefits of lithium-ion batteries include high cycle durability and a longer lifetime, as well as extremely low self-discharge. These are the very reasons why lithium-ion cells are widespread in consumer electronics, and are already used in millions of laptops, mobile phones, and power tools.

However, the requirements for their use in the automobile are far more demanding. Whether in arctic temperatures or in tropical heat, on the highway or on streets in poor condition the battery has to work perfectly. If a car is involved in an accident, the battery must not pose an additional hazard. SB LiMotive's development activities thus aim not only to further improve power and energy density, as well as achieve higher cycle durability and a longer lifetime, the aim is also to adapt the new technology to high automotive safety standards.

In order to achieve these objectives, SB LiMotive is working to further improve cell chemistry and cell design. The integration of cells into a battery module is also being optimized. In order to monitor and control individual cells, a complex battery management system is being developed.

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The battery development process takes into account the different requirements of energy storage systems for hybrid and electric vehicles. For electric vehicles, a high energy density is required. To drive longer distances, the battery must be able to store a great deal of energy. In contrast, power density is more important for hybrid vehicles, as the battery must be able to store a high amount of energy that is used again within a short period of time.

Dr. Joachim Fetzer, executive vice president of SB LiMotive, says: "To improve energy and power density, we are focusing primarily on optimizing the materials in the cell chemistry. In doing so, we aim to significantly increase power density for hybrid applications and energy density for electric vehicles. Thus, we will have increased the key parameters of the lithium-ion battery by 30 to 40 percent within three years. One main topic of battery development is to keep battery costs low. By significantly improving battery power and increasing the energy content of each cell, the number of cells required can be decreased. As a result, the battery is lighter and less expensive. Moreover, costs can be further reduced by increasing production volumes as well as by standardizing components and increasing productivity. "By 2015, we expect the battery pack to cost roughly one-third less than today," says Fetzer.

Young Woo Park, president of SB LiMotive, took stock of the still relatively new joint venture at the IAA: "Thanks to current developments at our company, we are confident that we can achieve our objective of getting lithium-ion cells as energy storage for hybrid vehicles into series production by 2011. And by 2012, we will be able to start series production for electric vehicles. With our locations in Korea, the U.S., and Europe, we are close to our customers in all major markets." This year, the company moved into its new headquarters in Giheung, Korea, and in September 2009, the ground was broken in Ulsan for the facility in which lithium-ion cells will go into series production.

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### **About SB LiMotive Co. Ltd**

*SB LiMotive Co. Ltd was set up in September 2008 as a joint venture between Samsung SDI and Bosch. The company with locations in Giheung and Ulsan (Korea), Stuttgart (Germany), Orion und Springboro (USA) employs some 500 associates. SB LiMotive aims to develop and manufacture lithium-ion batteries for standard use in hybrid and electric vehicles.*

*More information at [www.sblimotive.com](http://www.sblimotive.com)*