

APB begins demonstration test of All Polymer Battery onboard Kawasaki's Autonomous Underwater Vehicle

APB Corporation (Head Office: Chiyoda-ku, Tokyo; President: Hideaki Horie; hereinafter referred to as "APB") announced today that it has started a demonstration test of the next-generation lithium-ion battery "All Polymer Battery" on an autonomous underwater vehicle (hereinafter referred to as "AUV") developed by Kawasaki Heavy Industries, Ltd. (Head Office: Minato-ku, Tokyo, Hyogo and Kobe-city, Japan; President and CEO: Yasuhiko Hashimoto; hereinafter referred to as "Kawasaki").

The demonstration test will begin in July 2020, and will be powered by a water-resistant, All Polymer Battery, which is being jointly developed by APB and Kawasaki, as the power source for the AUV.

AUVs are manufactured for the purpose of maintaining and inspecting underwater facilities by applying submarine-related technologies, and are required to work underwater for long periods of time in harsh environments such as deep sea.

All Polymer Battery is a bipolar laminated battery that requires fewer parts. Because it is made of polymer, the cell size can be increased, and it has a high energy density when laminated. Therefore, the use of All Polymer Batteries in AUVs will increase the capacity of the batteries that can be installed in the limited space in the aircraft and enable longer driving time. In addition, the batteries used in AUVs must be able to withstand the high water pressure environment on the seabed, and we have already confirmed that the All Polymer Batteries are resistant to water pressure.

The first step of the demonstration test will be to test the power output of the AUV in the test area on the quay of Kawasaki's Kobe Works. In the future, we plan to conduct further tests using actual AUVs, including continuous cruising range, charging characteristics and water pressure resistance.

Starting with this demonstration test, APB will continue to take on the challenge of developing applications for all resin batteries, including large stationary power storage areas.

About All Polymer Battery

All Polymer Battery is the first large scale bipolar lithium-ion battery modules called All Polymer Battery, which was co-developed by Hideaki Horie, current CEO of APB, and Sanyo Chemical Industries, Ltd. ("Sanyo Chemical"). To realize high-quality batteries, we have developed a bipolar structure where current flows across the cell interfaces perpendicular to the electrode plane, and polymer as a basic material. The electrode material of All Polymer Battery is wrapped with gel-like polymer containing an electrolytic solution, which is realized by

surface activity control technology of Sanyo Chemical. Through the adoption of such technologies, our All Polymer Battery is characterized by such features as high reliability, high energy density, and innovative manufacturing processes at the same time. With fewer parts needed thanks to bipolar structure and polymer-based constituent material, All Polymer Battery has high flexibility in size and shape of the cells, which will help us to create thicker electrodes and larger cells.



All Polymer Battery module



Kawasaki's AUV

About APB Corporation

Established: October 2018

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