

Soft battery system improves Redermor's underwater performance

Lithium-ion battery system provides five hours of autonomous operation for unmanned underwater vehicle

GESMA (Groupe d'Etudes Sous Marines de l'Atlantique) chose Saft to develop a rechargeable lithium-ion (Li-ion) battery system that notably boosts the performances and payload capacity of the experimental platform Redermor (Unmanned Underwater Vehicle).

GESMA developed the Redermor UUV in the 1990s as an experimental platform to evaluate data acquisition and acoustic communications technologies for detecting and identifying underwater mines.

Redermor now operates as a fully autonomous free-swimming vehicle. It is six metres long, about one metre in diameter and weighs between 2.7 and 3.2 tonnes, depending on the specific version. Eight electric thrusters make Redermor very manoeuvrable and enable it to travel at speeds of up to 10 knots at depths down to 200 metres. It is also designed to carry large payloads (about one tonne and one cubic metre) such as high resolution sonar and a large range of sensors.

Required power is drawn from a 260 V onboard battery. As part of the new version (Redermor-3) design process



GESMA chose the Saft's Li-ion technology in order to drastically reduce the size of the battery for the same performance as the previous battery system and also to create an easy to operate and maintenance-free subsystem. The smaller battery size enable the vessels to carry additional equipment or to add another high power battery pack to double its endurance.

The new Li-ion battery system provides Redermor with up to five hours of autonomous power for its electric thrusters and onboard electronics. Packed in a compact, maintenance-free module, this battery system is just half the size of its predecessor.

Custom designed Li-ion module

The Redermor-3 battery system is based on Saft's VL45E Li-ion cells originally developed for hybrid and electric vehicle applications, packing maximum energy into a lightweight and space efficient package. With no maintenance, the battery system has a low auto discharge and offers excellent reliability through its long operational lifetime. Saft has integrated these cells into a custom built module, designed to make the best possible usage of the limited dedicated space. The battery pack

also includes an electronic control management system for the monitoring of charge and discharge voltages and cell temperatures.

Li-ion for UUVs

Li-ion technology is now widely used on many defence vehicles and equipment and is quite common on underwater vehicles. Saft is prominent in this market and offers solutions based on sound architecture and proven technology, taking advantage of its extensive experience of Li-ion in many other highly demanding applications.

Saft systems are based on a range of standard industrial or special cells and these can be used to design solutions, tailored to any requirement. Saft Li-ion battery systems are used in all types of unmanned underwater vehicles (UUV), often as the sole source of onboard power. They can also help to optimize the propulsion system alongside fuel cells. They also have very long endurance at sea, working cost effectively with diesel engines thanks to their long, high cycle life.

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