

LIONSKIN – a 3D-printed lithium-ion rechargeable battery in any shape

VALUE PROPOSITION

A light, safe, customizable shape battery cell; capable of fast charging and long cycle life; 3D-printed using readily available plastic materials; seamless battery integration into wearable technology; Battery power intrinsic to technology, inspired by the use and the user; no more separate fixed form-factor batteries required.

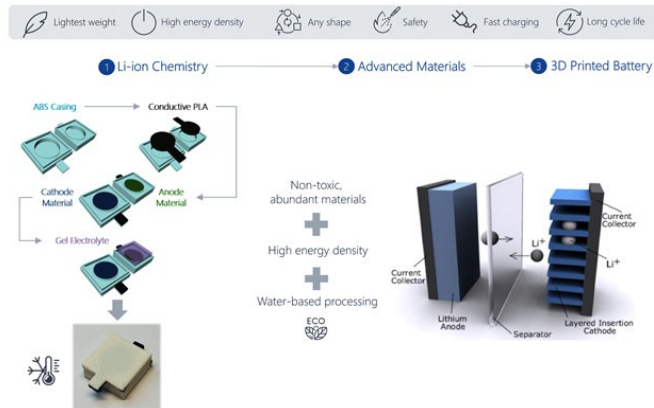
THE TECHNOLOGY

Problem addressed

Technological limitations in battery construction are hampering the evolution of new smart devices in the Internet of Things (IoT) era. Wearable and medical devices of the future, for example, will be designed without the constraints of present-day battery performance and shape. The next-generation wearables and medical devices will conform to the human body, without wires, and be multifunctional and operational anywhere.

Solution

A high-performing and safe Li-ion battery available in any form factor is highly desirable for designers of smart electronic devices. Professor Colm O'Dwyer has developed a method for the production of plastic battery cells through the combination of conductive and insulating plastics deposited using synchronous 3D printing. The 3D-printed Li-ion battery can be produced in any printable shape to suit designer needs. Battery cells may be adapted to 'click' together for modular use when increased voltage is required. Prototype batteries exhibit high specific capacities with long term cycling.



Schematic of 3D printed plastic batteries comprising an ABS shell, c-PLA conductive surfaces, lithium cobalt oxide cathode, lithium metal oxide anode and an aqueous PVP-SiO₂-based LiNO₃ gel electrolyte.

DEVELOPMENT OBJECTIVES

- Supply of customizable Li-ion battery prototypes for design stage
- Testing and design certification at Intertek

FIELDS OF APPLICATION

- Wearable Technologies
- Medical Devices
- Communications and IoT

INVENTOR

Professor Colm O'Dwyer – Professor in Chemical Energy at the School of Chemistry

PATENT

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AWARDS



FUNDING

