

**Press release:**

A recent development of OGRON BV, a Dutch company, is promising to revolutionise the Lithium battery technology and the rechargeable battery and energy storage technologies in general. The company has applied for patent protection at the European patent office.

The key element of this invention is an innovative technology used for the coating for cathodes and anodes: The active materials, without any additives, are thermo-sprayed onto the collector foils resulting in their firm adhesion to the surface. This process is suited for all Transition metal oxides, Lithium metal phosphates (olivines) and silicates.

With thermal-spraying, in essence, a gas flow (e.g. nitrogen) is brought to extremely high speed. The selected material, in powder form, is then added. Using thermal spraying, the desired coating materials are fused or melted with different technologies in a burner and deposited onto the surface of the component. To ensure grouting of the melted particles on the surface it is mostly previously scored by radiation. This creates a solid adhesive layer.

Looking, for example, at the cathode, a significant improvement of the electric conductivity is achieved. At the same time, the thermal stress for collector foils and active material is negligible.

As a result, it will be possible, for the first time, to manufacture Lithium polymer cells/batteries which

- are long-lasting (30 years and more)
- can be recharged very fast
- and can be manufactured in all dimensions

This invention is avoiding all thermal problems which, so far, are customary for conventionally manufactured rechargeable Lithium ion batteries. Since all chemical reactions are taking place on the surface of the cathodes and anodes, respectively, the development of heat during charge and discharge will be, in theory, to be zero. These properties are similar to the fast reactions of a super capacitor without reducing the cell/battery life.

With this technology, it is also possible to absorb very large energy volumes (more than 10 MW - e.g. off-shore wind power parks).

Looking at the individual cell, the construction of the single cells is so formed, that the internal resistance is in the order of  $m \Omega$ . In an electro-chemical cell, the interior resistance is the sum of the ionic and electronic resistance of the cell elements.

Today's Lithium ion batteries are limited to 800- 20.000 cycles, thus limiting their useful life. From a scientific view, this problem is of a very complex nature. This is particularly true for today's Lithium ion batteries. Key for the useful life of Lithium ion polymer cells are the reactions of the electrode materials with the electrolyte.

As mentioned above, the OGRON technology is using only active materials and no additives. As a result, only the electrolyte is determining the length of the useful life of the cells. With conventional technologies, the space of the electrolyte, over time, is drying out. In addition, as a result of degradation, the electrolyte is losing irreversibly particles reducing the cell performance. These increasing volumes of particles are moving to the electrodes surface, or are remaining in the electrolytic solution and/or in the gas space of the cell.

The OGRON technology is combining innovations of the cell construction with a permanent control of the electrolyte. As soon as the electrolytic solution is showing signs of deterioration (likely after 10 years), the battery management system will report this. The problem can be solved by replacing the electrolyte through built-in valves.

The Technical University of Delft has supported Dr. h.c. Franz W. Winterberg (the founder of GAIA Akkumulatorenwerke in Germany), the inventor, since 1995. Dr. Erik Kelder, together with his team of scientists, is prepared to assist him and OGRON during the construction of a proto-type facility to manufacture these revolutionary batteries.

Henny Wiggers, managing director of OGRON BV, announced that the company will be present its revolutionary technology during the 5<sup>th</sup> International Symposium of Large Ion Battery Technology and Application (LLIBTA; June 8 - 10, 2009; Long Beach, California).

At this event, Prof. Schoonman, Technical University of Delft will present the scientific fundamentals of this invention.

OGRON plans to present at LLIBTA, June 8-10, 2009 at Long Beach California a standard car:

- equipped with a 70 kWh battery
- with a 500 km reach
- rechargeable within 5 minutes

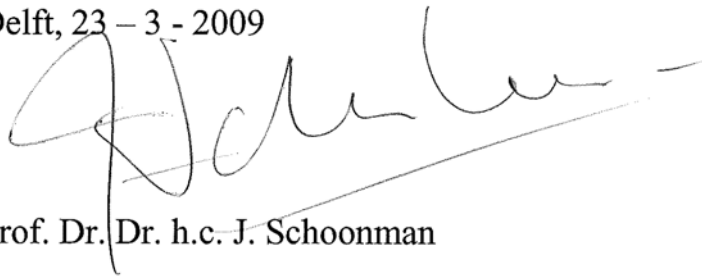
During these presentations, all relevant data will be recorded and shown. According to Mr. Wiggers, it is planned to also use this conference to contact battery manufacturers and investors.

In summary, we are confident that this invention will lead to significant cost reductions. Both in terms of investments and materials used, and that these storage systems could be an effective tool in the larger context of "climate change".

Through this technology, renewable energy will become more economic and easier to transport to the ultimate users. This new storage technology can help to decentralise energy production and make better use of wind power and solar energy for cities and communities.

The Technical University of Delft and myself are pleased to be part of this project.

Delft, 23 - 3 - 2009

A handwritten signature in black ink, appearing to read "J. Schoonman".

Prof. Dr. Dr. h.c. J. Schoonman