



Dear e-news reader,

Strong research promotes growth. It was therefore pleasing to note in late-August that the Swedish Government presented its coming budget for allocations to research and innovation initiatives. Annual funding will increase in early-2009, reaching a permanent allocation of five billion kronor by 2012. This attests to the fact that the Government realizes the importance of research for Sweden's economic growth, which is especially encouraging for those of us in the research community. It is too early to say just how this will translate, in monetary terms, for research institutes. However, we do know that 4.6 billion kronor will be invested in research related to medicine, engineering and climate, areas in which many of our clients are active. We are therefore confident that conditions are favourable for starting new research projects together with our clients.

An expressed ambition of the Government's research effort is to create and strengthen world-class research and innovation milieus in Sweden. Within Swerea and Swerea SICOMP we have

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Swerea SICOMP develops the batteries of the future

There is a steadily growing demand for light materials. Since manufacturers strive continually to build lighter vehicles, aircraft and boats, etc., all materials and components that do not contribute to the product's load-bearing capacity are a burden. Batteries and condensers are examples of such components. To meet the demand for lighter vehicles, Swerea SICOMP began about a year ago to develop new types of batteries and condensers based on polymer fibre composites. The idea is to develop a new type of light, multifunctional material that is structurally sound and can store electrical energy. The intention is for this material to be used to supply the electric cars of the future, in part or in whole, with electricity, while at the same time helping to make light, rigid and strong vehicle structures.

The concept, based on traditional carbon-fibre composites and used in the aircraft industry, is being developed in part in collaboration with Imperial College London. The basic idea behind the concept is to allow the carbon fibre, which conducts electricity, to function as an anode while at the same time giving the composite its rigidity and strength. Here, the conventional

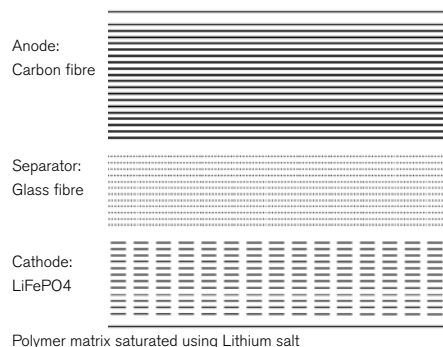
polymer matrix is replaced by an electrically conductive polymer. Electrical conductivity is achieved by the addition of lithium salts to the polymer matrix. These techniques have been demonstrated in our laboratory and several large-scale projects are being planned, so that work can begin on the development of concepts for industrial application.

"We envision electric vehicles with floor structures that also function as batteries and engine hoods that are condensers," says Leif Asp, who heads research activities at Swerea SICOMP in Mölndal.

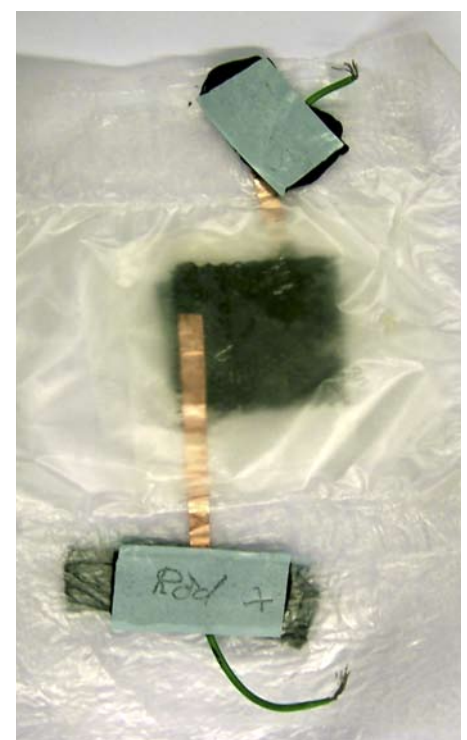
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Schematic view of the battery



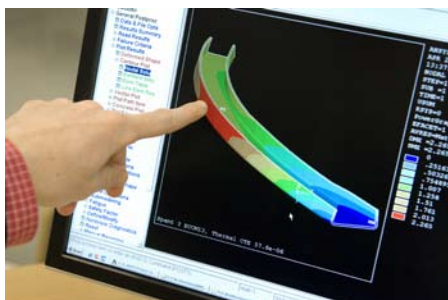
Initial trials with structural batteries.

FRP Durability Centre –

Using fibre-reinforced plastic materials in demanding applications and environments

Composite materials are now used in increasingly demanding industrial applications, often instead of metal, where requirements on performance, reliability and cost-effectiveness are high. At the same time, society is placing successively higher demands on industrial safety with respect to personnel and the environment, as well as on products and processes that meet the requirements of sustainable development.

During the spring of 2008, Swerea SICOMP and Swerea KIMAB established a centre of excellence with a focus on providing industry with top-ranking expertise in the use of fibre-reinforced plastic materials in demanding applications and environments. Examples of applications include wind-power units, process equipment with thermoplastic liners, material in scrubbers, in exhaust gas treatment plants and in other equipment in the energy sector. The institutes are internationally strong in their respective areas of expertise, where Swerea SICOMP contributes knowledge in the area of manufacturing technology, mechanical strength and design, and Swerea KIMAB applies its know-how with respect to chemical processes of corrosion, degradation and aging. The competencies of the two institutes are complementary, which means that the FRP Durability Centre covers virtually the entire field.



FEM modelling

Development of models

Current joint research is centred on, among other things, the development of models for describing polymer structures in multiple layers. The expectation is that this will eventually enable the creation of barrier structures with better diffusion and permeability characteristics for application in aggressive chemical environments. Another area of interest is adhesion of liners on GAP, where the degree and geometry of adhesion have a bearing on mechanical properties and durability. The FRP Durability Centre offers a range of services:



Testing of advanced composite components at Swerea SICOMP

Consultancy

- Material selection and design
- Status and lifecycle analysis
- Inspection and failure analysis

Research and development of polymer composites

- Material applications
- Mechanical properties in various chemical environments
- Corrosion and degradation of polymer materials
- Damage tolerance and control

Training

More information on the FRP Centre is available at: www.swereafrp.se

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STAFF NEWS



Jonas Engström

As of 1 September, Jonas Engström joined Swerea SICOMP as a research engineer in Piteå. Jonas, who completed a doctorate in applied mathematics at Luleå University of Technology in 2005, has a background in engineering physics. His doctoral studies concerned homogenization theory, which has applications in materials engineering.

Jonas previously worked at ABB Force Measurement in Västerås as a researcher and project manager in the area of measurement technology. He grew up in Ersnäs, just outside of Luleå, where he recently bought a home. At Swerea SICOMP, Jonas will work with research and project management.

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Jesper Eman

As of 1 September, Jesper Eman is employed at Swerea SICOMP in Piteå. Jesper graduated from Umeå University in January 2005, where he studied engineering physics. He specialized in computational physics. In June 2007, he graduated with a Licentiate degree from the Division of Solid Mechanics at Luleå University of Technology. The Licentiate thesis concerns observations of ultra-high-strength steel just prior to fracturing, as well as a method that has been developed for transforming these measurements into constitutive relations. Digital speckle photography (DSP) was used in the investigations. From September 2007 to July 2008, Jesper was employed as a research engineer at Ericsson Research in Luleå, where simulations of the 3G network were performed. At Swerea SICOMP, Jesper will work mainly with manufacturing simulation.

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Sofia Ekstedt

Sofia Ekstedt began working at Swerea SICOMP in Mölndal on 1 September. Sofia is employed as a research engineer. In the near future, however, she will begin doctoral studies concerning structural batteries. Sofia is a chemical engineer who specializes in materials engineering. In her thesis project, she assessed the possible use of renewable raw materials in the production of plastics for the hygiene industry. This was a joint project with the participation of the Div. of Polymer Engineering at Chalmers University of Technology and SCA Personal Care AB, where, after completing her thesis project, Sofia continued to work until she joined us at Swerea SICOMP.

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very strong research groups, for example, in the area of composite materials in demanding environments (see separate article in this edition of e-news). We hope that Swerea's leading-edge expertise will receive a significant capital injection that will help us to fortify and develop our international competitive advantage to the benefit of Swedish industry.

We are also pleased to announce that Swerea SICOMP will be arrang-

ing several events to celebrate its 20th anniversary in 2009, so please stay tuned! Client Days, INSIKT seminars and our annual composites conference are just a few examples.

We wish you a pleasant autumn,
Lars Liljenfeldt | Business development

The 20th Swerea SICOMP Conference on Manufacturing and Design of Composites

June 8-9, 2009 in Piteå, Sweden
Please reserve these dates!