Bayer deepens involvement in Solar Impulse aircraft

Bayer MaterialScience is expanding its contribution to the Solar Impulse project – an unprecedented around-the-world flight powered solely by solar energy scheduled for take off in 2015.

The company is responsible for the complete design of the cockpit shell of the second, improved model. Among its contributions will be an innovative insulating material. **Solar Impulse** and **Bayer MaterialScience** announced at a joint news conference in Payerne, Switzerland, that the new solar aircraft is expected to be completed in late 2013 and will conduct test flights the following year.[image_0]

The first model will remain available for additional missions. “We are studying several possibilities and it could perhaps be making its first flights around the United States next year,” announced **Bertrand Piccard,** the initiator and Chairman of the Swiss project. So far the solar aircraft has completed flights in Europe and most recently to North Africa, in each case with materials from Bayer MaterialScience on board.

“We are now deepening our involvement as we go from materials supplier to system leader for the new cockpit,” said **Patrick Thomas,** Chief Executive Officer of Bayer MaterialScience. “The Bayer Cross will be displayed on the aircraft in the future as a visible symbol of our commitment to this excellent partnership.”

Bayer MaterialScience is contributing a variety of products and solutions to ensure that the second, larger model of the aircraft will be lightweight, yet retain its rigidity. For example, because the cockpit cowl will be hinged for the first time, a section of it is being supported with a carbon fiber-reinforced plastic.

In addition, the polyurethane foam **Baytherm Microcell** will be used as insulation in places. It is being developed together with the chemical company **Solvay** for use in the new plane. The material offers significantly greater insulating performance than the current standard because Bayer researchers were able to shrink the pores in the foam by an additional 40 %. Highly efficient insulation is particularly important for the aircraft because it must withstand temperature fluctuations between –50 °C at night and +50 °C during the day.

Carbon nanotubes on board

“The significantly larger size of the new cockpit shell and Solar Impulse’s tight weight budget meant that we had to further optimise the weight through design measures and targeted choice of materials,” explained **Martin Kreuter,** Solar Impulse project manager at Bayer MaterialScience. Another innovation announced by Kreuter was the use of **Baytubes** carbon nanotubes in carbon fibre-reinforced structural components in order to reach more savings both regarding material and weight.[image_1]

“This will allow us to enlarge the wings of the new aircraft and increase the number of solar cells mounted on them,” Kreuter said. The current model, which has the wingspan of an **Airbus** and weighs as much as a mid-size car, has 12,000 solar cells on its wings.

Solar Impulse CEO and co-founder **André Borschberg** says that work on the aircraft is already far advanced. “80 % of the design phase and 50 % of the construction phase have been completed.”

The first manned around-the-world flight in a fuel-less aircraft is scheduled for take off in early 2015. The flight is expected to take 20 flight-days, with five to six needed just to cross the Pacific and two to three for the Atlantic crossing, according to Borschberg. Including the necessary breaks, the solar-powered aircraft’s journey from west to east will take a total of three to four months.

Solar Impulse HB-SIA is the first aircraft that can fly day and night without fuel or polluting emissions. It demonstrates the huge potential of new technologies in terms of energy reduction and the production of renewable energy. This carbon fibre aircraft, that has the wingspan of an Airbus A340 (63.4 m) and the weight of an average family car (1,600 kg), is the result of seven years of work, calculations, simulations and tests by a team of 70 people and 80 partners. A plane this light and of this size has never been built before. The 12,000 solar cells built into the wing provide four 10HP electric motors with renewable energy. By day the solar cells recharge the 400 kg lithium batteries which means the plane can fly at night. The Solar Impulse project is supported by main partners: Solvay, **Omega, Deutsche Bank** and **Schindler;** Official partners: Bayer MaterialScience, **Swiss Re Corporate Solutions** and **Altran;** Official scientific advisor: the **Ecole Polytechnique Federale de Lausanne (EPFL);** and aeronautical consultant: **Dassault-Aviation.**

Adresse:
http://www.gupta-verlag.com/polyurethanes/news/technology/12170/bayer-deepens-involvement-in-solar-impulse-aircraft