16 Stay Innovative – the Example of Lightweight Design:

Speakers: Angeliky Sery-Froschauer (Introduction), Michael Strugl (Introduction), Jan Dannenberg, Robert Machtlinger, Peter Priklbauer, Amer Affan
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Report:

In this session held by Upper Austria the topic of lightweight design as a focus strength of Central Europe has been discussed. Experts from Austria, Germany and Great Britain gave an overview about the current and future role of Central Europe in this context.

Jan Dannenberg, Berylls Strategy Advisors, explained that there are three reasons for the increasing importance of lightweight design in the automotive industry: To reach the CO2 targets, to compensate the additional weight of electric and hybrid vehicles as well as the additional weight of driver assistant systems and comfort equipment. The market of lightweight body design will increase until 2025 up to 100bn€. A stronger connection of material, process and function will be necessary to improve innovations. European OEMs and suppliers are innovation leaders, but China is on the rise. A global footprint will be more important in future to secure this position.

Robert Machtlinger, FACC, gave an interesting overview about the changes in aerospace market. Customer expectations and behavior regarding comfort and longer distance flights got more important. At the same time the cost structure of airlines changed significantly as fuel prices increased and ticket prices decreased. As a consequence the composite demand in airplanes was growing in the last years. He pointed out that a mass production with a fully automated manufacturing and inspection of structures made out of composite will be one of the future challenges. New materials and technologies will be necessary to meet the needs of the industry regarding efficiency.

Peter Priklbauer, Airbus, gave a deep insight in the possibilities of 3D printing as well as the current applications at Airbus. The advantages of 3D printing are obvious: less usage of material and energy, greater design freedom as well as independently of number of units. Nevertheless numerous topics have to be solved such as usable materials. Airbus uses the “LaserCUSING” technology which allows the usage of several metal materials, such as titanium alloys. The manufacturing process is fully digitally. Priklbauer predicted a fast increase of 3D printing within the next years. He summarized that this technology will replace or complement conventional manufacturing methods in many industries such as vehicle construction, manufacturing and engineering which are important for Central Europe.

Amar Affan, AFFAN innovative Structures, lighted lightweight construction from the perspective of architecture. He gave interesting case examples of innovate lightweight architecture with carbon fibre usage in the structure and gave an overview about the production methods, possibilities, maintenance as well as the problems and current borders. A comparison of traditional construction methods with structural carbon constructions shows the various options as well as the advantages of each method regarding design, flexibility, construction time and costs. A glance at the past illustrates how the structural composite production started.

In future the importance of lightweight design will increase in many industries. New production methods and applications will open new opportunities. Central Europe is now one of the innovation leaders, but other regions are catching up. The ongoing efforts need to be strengthened to stabilize the current position.