ELSEVIER

FEATURE

Expert insights in Europe's booming composites market

Michael Effing

Chairman of the Board of Composites Germany and AVK, Founder and Managing Director of AMAC GmbH

Composites are a dynamic, high-volume growth industry in Europe.

Europe is an important location, among others, due to its very specific and efficient cooperation and joint technological developments between research and industry. From country to country, the industrial organization as well as the research landscape varies. In this highly sophisticated production technology environment, complex materials and often multi-material technologies are constantly developed and improved, which enables automated mass production and advanced lightweight technologies to stay in high wage countries. In this context, Germany figures as a leading supplier for lightweight applications, with enormous strength in the manufacturing and mechanical engineering sectors, many strong and successful SMEs and numerous OEMs in all end markets present on the market. Key segments are traditionally automotive, aerospace, and electronics, but there is also a focus on wind energy and building and construction (Fig. 1).

Traditionally, the transport sector with aerospace and automotive represents more than a third of the market. The B&I sector represents almost the same proportion, with a value in Europe of 8 billion euros, and where approximately 900,000 tons of composite materials are used. Examples of how composites can be used in the building industry can be seen by the Dubai-based Company AFFAN, which is making a large variety of buildings, ranging from large entrance areas of skyscrapers to complete logistic centers, museums, and even private villas in composites, using resin infusion and prepreg technologies with carbon and glass fiber reinforcements. While in the Middle East and Asia, the restrictions and standards are not as tight as in Europe or in Germany, it is expected, that the market, specifically in these regions as well as in South America, will grow even faster than in Europe. The most advanced use for composites in infrastructure is actually the rotor blades for wind turbines and the composite pipelines and vessels (Fig. 2).

FIG. 1
Dr. Michael Effing.

0034-3617/ http://dx.doi.org/10.1016/j.repl.2017.06.086

Please cite this article in press as: M. Effing, Reinf. Plast. (2017), http://dx.doi.org/10.1016/j.repl.2017.06.086

FIG. 2
Example of a composite building (Image courtesy of AFFAN).

Research and industry working shoulder to shoulder

Specific to the German market is the close cooperation between research and industry. For example, at the Campus of RWTH Aachen University, research institutes cooperate closely with industrial partners in a pre-competitive way in order to drive innovation and further develop cost-effective, integrative, high-volume production technology. In June 2017, the AZL partner network counted over 80 industrial partners which are cooperating with 9 research institutes on the Campus, which are linked to lightweight technologies. Under the auspices of AZL, joint studies are being carried out with the aim of identifying new applications or market opportunities for specific technologies or, the other way round, new and often multi-material technologies for specific applications. Joint partner projects are also being carried out, in which 10–15 companies share the cost of new pre-competitive developments, such as developments of key processes like thermoplastic composites, high-speed RTM, or pipes and vessels. Another focus is on finding out new possibilities for using high-performance SMC. HP-SMC means composites are made of various fiber reinforcements, from carbon to glass, with continuous and discontinuous fibers as well as various new resins, such as polyester, vinyl ester and epoxies, opening the door for more structural applications in the automotive industry, such as floor pans, as well as new applications for high-speed trains and other transportation. This SMC workgroup has also requested AZL to perform a market and technology study for the development of design guidelines for HP SMC.

Another study focuses on identifying new potentials for composite technologies in the building and infrastructure market. For the latter, over 25 partners have joined along the entire value chain, from raw materials to OEMs such as producers of facades, panels or window frames. An interesting sub segment is the use of fiber reinforced concrete.

AZL is part of the new group for integrative production technology on the campus of RWTH Aachen. It is the largest group with offices for more than 800 people. The group around the AZL is a veritable landscape on its own, where companies are having their own offices and work shoulder to shoulder with the researchers of the universities. Very recently, a branch of this group of integrative production technology was the street scooter company which was acquired by the German post DHL. This branch is now producing approximately 10 000 electrical vehicles per year in Aachen, Germany, for the German post offices, using also affordable lightweight materials.

Together with its partners, AZL can also apply for government-funded projects, for example from the EU or the German government of BMBF or BMWI. Last but not least, an important service is the business development support in the field of new markets and new regions. AZL business partners will be focusing later this year on Eastern Europe, while meeting with industrial partners and

Please cite this article in press as: M. Effing, Reinf. Plast. (2017), http://dx.doi.org/10.1016/j.repl.2017.06.086