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AZL AACHEN EXCELLENCE IN LIGHTWEIGHT PRODUCTION PARTNERSHIP

NEWSLIGHT #08

NEWSPAPER FROM THE INTERNATIONAL AZL LIGHTWEIGHT PARTNER NETWORK

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COMMENT BY PORTIA YARBOROUGH

COMPOSITES WEB: SPURRING INNOVATION

DuPont Performance Materials outlines the potential of high volume thermoplastic composite solutions and presents the results of recent innovations enabled by its Vizilon® thermoplastic composite offering

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Driving new ideas, developing innovative solutions and meeting the latest standards comes down to one thing: making the right connections. Because there are no one-size-fits-all answers, DuPont works hand-in-hand with our customers to help them find optimal solutions to their specific needs. Among the biggest challenges facing many industries is how to reduce environmental impact while continuing to deliver quality products. A case in point is the automotive sector, with the focus on light weighting solutions that reduce carbon dioxide emissions without compromising performance.

> **The key to innovations lies in identifying the right mix of different technologies and expertise**

Portia Yarborough, Business Manager – Composites at DuPont Performance Materials

Multi-Material Design Approach – No single material can help them achieve this goal – which is why holistic thinking and collaboration along the value chain is so important. It requires a multi-material design approach that supports material optimization by using the right material in the right place to achieve performance improvements, weight savings and cost reductions all at once.

In this regard, we see significant potential in the use of thermoplastic composites (TPC). They allow automakers to integrate lightweight materials selectively in specific areas of a vehicle. Vizilon® TPC is a growing family of thermoplastic composites solutions within the DuPont product portfolio. Our existing capabilities and enabling technologies, including predictive engineering, help us to continue to validate our Vizilon® TPC offering and develop tailored solutions by pooling expertise with partners in the value chain.

An example of a successful collaboration in this area is our work with EconCore N.V. on the development of thermoplastic composite based honeycomb sandwich panels. Combining EconCore's ThermHex technology with DuPont™ Vizilon®, this partnership has given shape to ultra-light sandwich panels that directly meet the needs of customers in sectors such as automotive, construction, leisure and energy. The panels demonstrate that strength, flatness and high rigidity can go hand in hand with lightweight and high-volume applications.

The key to innovations such as these lies in identifying the right mix of expertise, materials innovation, design, processing, and assembly techniques along the value chain. **As an AZL-premium partner, DuPont values the centre's unique platform for engagement with different sectors and experts working at the cutting-edge of research.** This is why we co-located our research activities at AZL in 2016 with a view to matching market needs with commercially viable innovations. DuPont's on-going commitment to investing in innovation and future technologies is based on precisely these types of connections.

Learn more about DuPont's partnerships and innovations at Pavilion 5A, Stand E24 during JEC World 2017, 14-17 March or by visiting vizilon.dupont.com

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UNIQUE AND INNOVATIVE BUILDING FAÇADE SYSTEM

Construction company TGM collaborated with Indupol, Aliancys, BÜFA and Solico to create novel construction technologies and a great composite façade project example with a unique shape and design.

TGM is a Dutch construction company specialized in the installation of building façade systems. Over the years the company has been acting as subcontractor in multiple construction consortia in the Netherlands, completing a large number of office and residential buildings in the high end of the market.

Novel composite façade solution of the new Eurojust office building in The Hague, Netherlands.

Typically TGM is installing a complete façade solution onto the bare concrete building. This façade assembly includes structural components, insulation to heat and moisture, ingress protection, as well as elements that provide aesthetics.

Unique Design – Architects have been asking TGM for help to create buildings with unique and distinctive looks. For that reason, a solution based on composites seemed logical, as that provides architects with high flexibility to create novel shapes and designs. In addition, it brings to the building owner the interesting benefits of long service life and minimal maintenance.

A novel composite façade solution was first developed for the construction of the new Eurojust office building in The Hague, Netherlands. This project required the delivery of over 700 façade panels of multiple widths and lengths (ranging from 3.5 to 10 m).

Changing Requirements – Right from the start TGM involved composites design company Solico, resin suppliers Aliancys and BÜFA, and component manufacturer Indupol to develop the composite system and a reliable process for large-scale production. After having gone through several design iterations, the companies developed a compact proprietary composite system that met all the requirements. As an illustration: a mock-up of the assembly successfully passed fire testing and a real-life and very harsh mechanical attack by experienced vandals.

Smooth Productions and Installation – The composite components were made by Indupol through a hand lay-up process in modular molds that were adjusted to the desired shape and dimensions, using resin from Aliancys and Büfa (delivered through Distributor Euroresins). After molding, the parts were treated with a topcoat in white color and transported to the job site for installation. With minimal use of scaffolding, the parts were lifted by a crane and attached onto the building.

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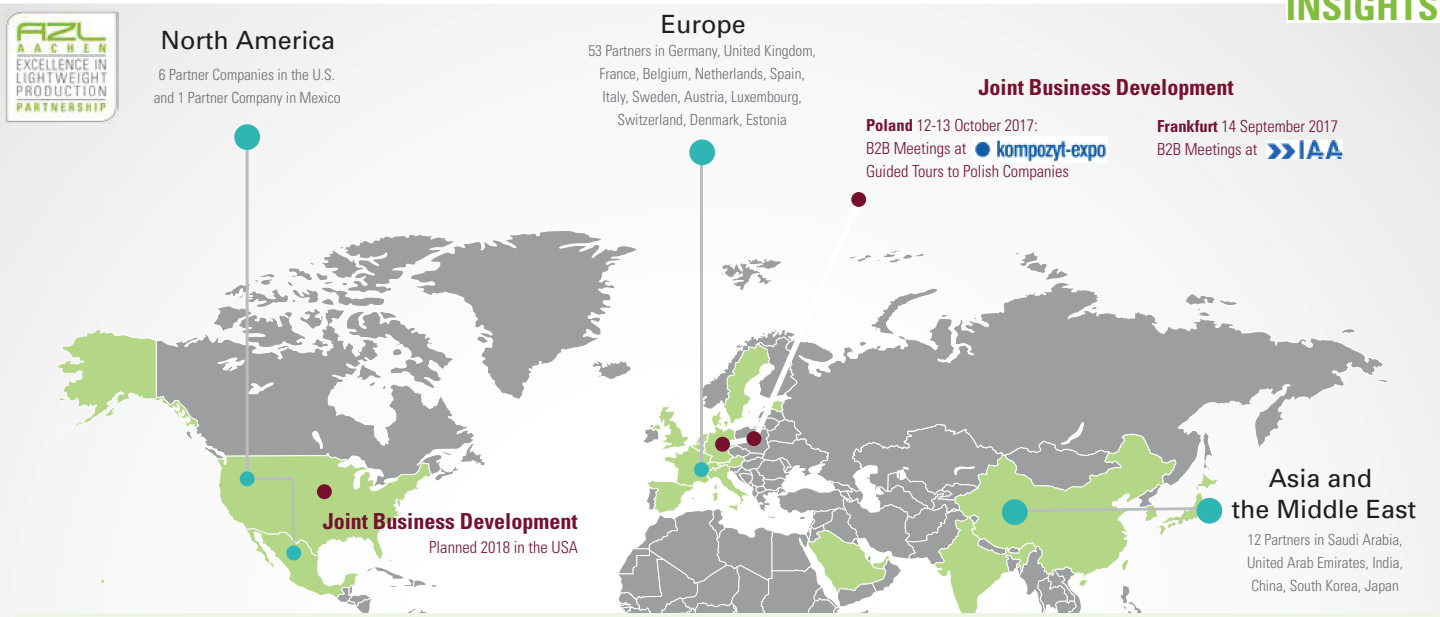

INTERNATIONALIZED LIGHTWEIGHT ENTERING NEW REGIONS AND NEW MARKETS FOR LIGHTWEIGHT AZL PARTNER COMPANIES LAUNCH JOINT BUSINESS DEVELOPMENT

To bring lightweight and composite technologies forward beyond aerospace and automotive sectors and the established regions in central Europe and the USA, new perspectives and broad exploration are needed to uncover the great potential of composites in areas yet to be discovered. In order to jointly address new regions and markets, and develop novel business for lightweight production, the AZL Partner Network has decided to launch a new collaborative model for Joint Business Development. For the first year, Eastern Europe with a focus on Poland was selected to be the region for extended matchmaking. With the entry to the EU, Poland has developed to an increasingly attractive destination for foreign direct investment (FDI) for global companies and has experienced a growth of foreign trade which almost expanded ten-fold. Being an important producer of finished passenger cars and buses, the automotive industry is one of the leading trading sectors in Poland. At the same time, Poland has a history with Glass Fibers and Composites. From October 12th to 13th, AZL Business and Premium partners have the opportunity of participating B2B meetings at the largest Eastern European composite show, Kompozyt Expo 2017 in Kraków, a subsequent networking dinner and guided tours to Polish composite companies.

12 B2B Meetings and guided tours

MARKET INSIGHT

The AVK (Federation of Reinforced Plastics e.V.) represents the interests of manufacturers and processors of reinforced and filled plastics, engineering thermosets as well as their raw materials suppliers on a national and European scale. Elmar Witten, Managing Director at AVK and Volker Mathes in charge of Business Development at AVK summarize latest trends of the CFRP and GFRP markets drawing on Composites market report 2016 and the results of the 8th Composites market survey of Composites Germany.

» *Especially the thermoplastic production technologies as well as the RTM-Technology have gained special interest and an increase in production volume.*

Elmar Witten
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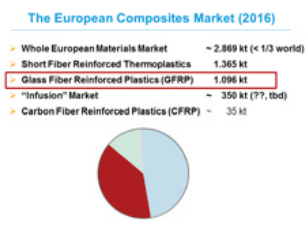
AZL: Can you describe the development of the market for glass fiber reinforced plastics?

Elmar Witten: The worldwide composites market reaches a level of about 9 million tons. Europe's share of global composites production continues to decline – despite its absolute growth in total production over recent years. Processing of commodities (standard products), in particular, has clearly shifted towards Asia and America over this period. In short, GRP production in Europe continues to grow but will probably lag behind the global trend.

How is the market allocation of the different Composites material?

The AVK together with their partners CCeV (Carbon Composites e.V.) and AMAC (Advanced Materials and Consultancy GmbH) collects data concerning the European Composites Market. The following figure refers to this data.

The whole European market reaches a level of about 2.850 kt in 2016. This is a little less than 1/3 of the world production. The biggest single segment in this market is the Short Fiber Reinforced Thermoplastics. They have a share of more than 45% of the complete market. The next bigger group are the GRPs with a volume of 1.096 kt. The term GRP refers to all glass fibre reinforced plastics with a thermoset matrix as well as glass mat reinforced thermoplastics (GMT). The "Infusion" market reaches a level of 350 kt and last but not least CRP had a production volue in Europe of 35 kt. Besides there are other materials like Natural Fiber Reinforced Composites or ceramic composites for example. The GRP market is the market-segment we mention when we typically talk about the GRP-Market.



How is the European GRP-market developing?

Volker Mathes: In 2016, the volume of glass fiber reinforced plastics (GRP) manufactured in the European countries has grown by 2.5%. The market growth continues at the same rate as in 2015. The total production reaches a volume of 1.096 million tons..

Which are the growing sectors in Europe in the composites business?

Elmar Witten: It may not be overseen that GRP products are very often already well established in different markets. This includes single part production as well as serial production in many different application fields. The production volume is many times higher as the CRP-production volume (35 kt Europe 2015) for example.

The largest buyers of GRP components are to be found in the transport and construction sectors. These each consume around one-third of total production and play a major role in national economies. The long-term trend for GRP production therefore tends to follow the growth of the economy as a whole. Nevertheless, no rapid expansion of production (similar to that seen in the CRP segment) is to be expected in the near future. This is partly due to the very considerable level of existing production and also the fact that fluctuations in one industry are usually "smoothed out" by other applications. Especially the thermoplastic production technologies as well as the RTM-Technology have gained special interest and an increase in production volume.

What are the upcoming trends?

Volker Mathes: As the results of the 8th Composites market survey – published by Composites Germany - show the general business situation is largely seen as positive in the composites market. When asked to assess the general business situation in three regions – Germany, Europe and worldwide – the respondents came to highly positive conclusions. For example, 84% of respondents see the current worldwide business situation as positive. Beyond 29% said they were expecting their situations to improve in Europe, whereas in the current survey this value has now risen to 40%. By contrast, the proportion of those expecting a negative development has stagnated at 5%.

As a conclusion the survey shows that the respondents see their prospects as very positive for the coming months. The market is therefore likely to continue in its dynamic development – all the more so as half of all respondents believe that their businesses will become more active on the market, while only 2% are anticipating a decline.

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