

## **The European Composites Market 2008/2009**

**The general development of the European production industry as well as the plastics industry between 2008 and 2009 had its effect on the market for fibre-reinforced polymers / composites as well. By the end of 2009, the production volume of the entire European market analysed in this context will probably have dropped by about a third as compared to 2007. This highly heterogeneous market necessitates a differentiated view; not all market segments are feeling the crunch in quite the same way. Companies involved in this market differ in terms of their processing techniques, their structure and size, as well as the industrial applications for which the respective component parts and the products are targeted. In general, corporate morale is far from being subdued. Managements are primarily concerned about consolidation of the core business; besides, considerable efforts are being made to embrace market opportunities for new products in the existing markets as well as new ones.**

## **Fibre-Reinforced Plastics: Market Data and Market Development between 2008 and 2009**

This year, the German professional association AVK (Industrievereinigung Verstärkte Kunststoffe) [Federation of Reinforced Plastics] – as in previous years – once more performed a survey in order to determine 2008 production volumes for fibre-reinforced plastics throughout Europe. For the first time, however, owing to the dynamic market development, an assessment regarding the current year (2009) was included, too. In order to obtain comparable data, the “entire“ European market analysed in this context was once more limited to those countries that are familiar to raw materials suppliers interviewed in this context. Market data collection focuses on glass fibre - reinforced plastics (GFRP). In quantitative terms, glass fibres are still

heading the list of reinforcing materials; the development of carbon-reinforced plastics and natural fibre-reinforced plastics in particular continues to be elusive, thus precluding a comparable survey. A brief qualitative description follows below.

### **GFP Production 2008 and 2009: Overall Developments**

In 2009, GFP production volumes in Europe (815.000 t, see Fig. 1) declined by about thirty percent as compared to 2007. Despite the detailed representation of individual years in this context, it is recommended to consider three-year periods as entities. Over shorter time frames, information obtained from raw materials producers in the composites market (here: resins and glass fibres), on which data acquisition primarily relies, may, after all, deviate from the volumes actually processed during this time period. Especially at the start of the economic and financial crisis (2008), the depletion of stocks by companies caused the decrease of raw material sales initially to exceed the decline in composites production. The second half of 2009 in particular, however, is accompanied by noticeable sales increases as compared to the first six months. A slightly increased decline in production relative to the decrease of the entire European plastics production in 2008 is to be attributed primarily to the reduced contribution of composites to the commodity market, which did not suffer quite as much of a slump as did the industrial business.

In view of the current decline in production volumes, which – to this extent – was unparalleled in previous years and corresponds to sales and turnover losses occurring on a similar scale, all companies right now are first and foremost concerned about the assurance of their financial solvency respectively their “cash management“. Stocks are not being replenished, and all business cycles have been cut back, sometimes extremely so.

Pricing, too, has had varied effects. Processors found prices for used raw materials in 2009 to remain relatively stable, especially as compared to previous years. On the other hand, due to the prevailing excess capacities in individual market segments, companies' own sales prices have certainly come under pressure.

	2009* kt	2009/08*	2008 kt	2008/07 %	2007 kt
SMC	160	-23.8	210	-7.1	226
BMC	56	-20.0	70	-10.3	78
<b>∑ SMC/BMC</b>	<b>216</b>	<b>-22.9</b>	<b>280</b>	<b>-7.9</b>	<b>304</b>
Hand lay-up	123	-39.1	202	-17.2	244
Spray lay-up	74	-28.2	103	-16.9	124
<b>∑ Open mould</b>	<b>197</b>	<b>-35.4</b>	<b>305</b>	<b>-17.1</b>	<b>368</b>
<b>RTM</b>	<b>94</b>	<b>-11.3</b>	<b>106</b>	<b>-13.1</b>	<b>122</b>
Sheets	56	-18.8	69	-21.6	88
Pultrusion	39	-15.2	46	-8.0	50
<b>∑ Continuous processing</b>	<b>95</b>	<b>-15.7</b>	<b>115</b>	<b>-16.7</b>	<b>138</b>
Filament winding	69	-12.7	79	-1.3	80
Centrifugal casting	55	-11.3	62	-6.1	66
<b>∑ Pipes and Tanks</b>	<b>124</b>	<b>-12.1</b>	<b>141</b>	<b>-3.4</b>	<b>146</b>
<b>GMT/LFT</b>	<b>75</b>	<b>-21.1</b>	<b>95</b>	<b>-4.0</b>	<b>99</b>
<b>Others</b>	<b>14</b>	<b>-12.5</b>	<b>16</b>	<b>-11.1</b>	<b>18</b>
<b>Sum:</b>	<b>815</b>	<b>-23.0</b>	<b>1058</b>	<b>-11.5</b>	<b>1195</b>

Fig. 1: GFP production volumes in Europe, itemised by techniques / components (2009\* = estimated)

### Trends in the Development of Procedures / Components

The demand for and production of thermosetting component parts made of SMC (sheet moulding compound) respectively BMC (bulk moulding compound) depended on market developments in the main areas of application – automotive and electronics / electrical equipment. The decrease in vehicle production by as much as 50% in some cases, accompanied by even greater losses in the truck sector necessitated a structural reorientation of the key players in this market segment.

Processors using the open techniques of hand lay-up and spray lay-up are experiencing the full impact of general market developments at the moment. The decline in applications throughout the utility vehicle sector is almost matched by the setbacks with regard to the typically low-volume production of component parts with large surface areas (for instance in conjunction with boat building). Meanwhile, the contribution of these processing techniques to the entire composites production volume has dropped from almost thirty to less than twenty-five percent – a trend that is certain to affect the market structure, which is characterised by a large number of small and medium-sized processing companies tending to avoid too much automation, employing processes instead that are associated with limited acquisition costs.

Production of component parts made by closed RTM (resin transfer moulding) has suffered comparatively less of a setback. This may be attributed to the continuous substitution of open techniques in conjunction with the low-volume production of component parts with large surface areas.

Among so-called continuous techniques, the market for pultruded GFP profiles in particular is holding its ground relatively well on the market; which is primarily due to individual new infrastructural projects. Current market dynamics with regard to flat sheets are exemplified by the discounts offered by the German insurance industry for motor homes with GFP roofs. Insured persons (consumers) are profiting from

attractive savings in conjunction with reduced insurance premiums because of specific material properties (in this case for impact resistance).

The partially publicly funded building sector (including EU subsidies) as well as new sales territories, especially in Eastern Europe, have slowed down the decline throughout the GFP pipeline construction and the tank building sector. Select niche markets, such as sewer renovation with tube liners, continue to realise considerable growth rates in double-digit figures.

Just like other procedures, thermoplastic moulding compounds and semi-finished articles depend largely on the development of the automotive sector and are showing corresponding setbacks. An effort will have to be made with glass mat reinforced thermoplastics (GMT) as well as subsequently launched continuous strand – reinforced thermoplastics (LFT) in order to prevent stagnation respectively further decline in the product life cycle; one approach may be to improve their acceptance among customers. This is exemplified by LWRT materials (low weight reinforced thermoplastics) that are characterised by comparatively low weight per unit area; these materials are manufactured by new production techniques and are just starting their product life cycle.

Irrespective of the process being used, one of the major challenges for composites companies is to obtain orders for larger series production. Pertinent automation efforts are still offering enormous growth potential. Apart from new materials, the emphasis is now on new processes and partially also on the development of “mixed techniques” respectively hybrid production techniques (such as automated manual processes or combinations of prepreg and RTM systems). Thus, attempts have been made to use natural fibres in conjunction with “conventional” techniques (such as SMC).

## Application Industries at a Glance

Despite the variety of different developments shown by individual processing techniques, the contributions of individual application industries in general are much the same as in previous years (see Fig. 2). The slight downward trend in the transport industry was compensated by a minor increase in the building sector. Generally, the recession in Europe has affected almost all areas of application to a similar degree.

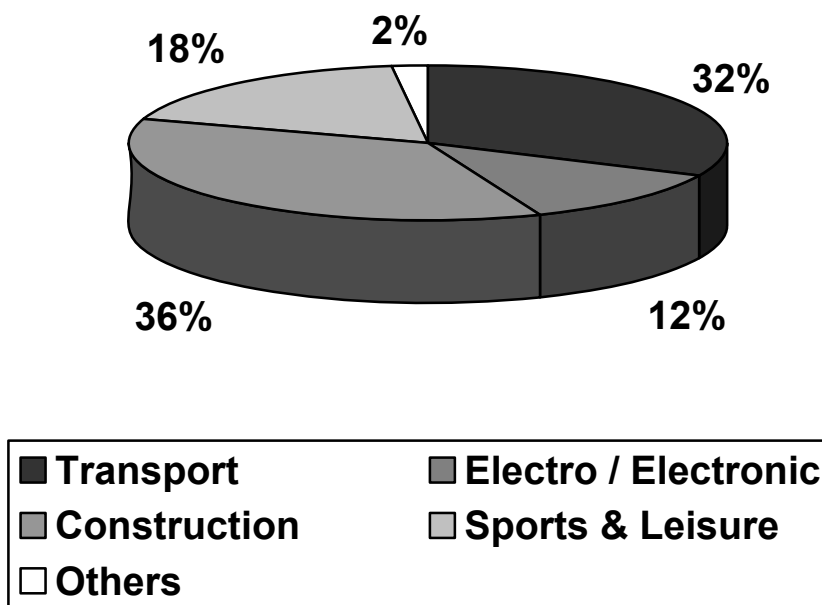


Fig. 2: GFP production in Europe for individual application industries (year: 2009)

## GFP Production in 2008/2009, Itemised by Countries

The distribution of the total GFP production volume over the European countries respectively groups of countries included in this analysis is shown in Fig. 3.

Currently heading the list of large players in the European market are Spain, Italy, Germany, the UK, and France, whose share in the total volume has increased from approximately two thirds to almost 75 % by now.

	<b>2009*</b> <b>Kt</b>	<b>2009/08*</b> <b>%</b>	<b>2008</b> <b>Kt</b>	<b>2008/07</b> <b>%</b>	<b>2007</b> <b>Kt</b>
UK / Ireland	106	-13.8	123	-14.6	144
Belgium / Netherlands / Luxembourg	31	-18.4	38	-7.3	41
Finland / Norway / Sweden / Denmark	52	-24.6	69	-13.8	80
Spain / Portugal	188	-20.3	236	-12.6	270
Italy	122	-33.3	183	-12.9	210
France	87	-24.3	115	-12.2	131
Germany	118	-18.6	145	-6.5	155
Austria / Switzerland	13	0.0	13	-23.5	17
Eastern Europe**	98	-27.9	136	-7.5	147
<b>Sum:</b>	<b>815</b>	<b>-23.0</b>	<b>1058</b>	<b>-11.5</b>	<b>1195</b>

Fig. 3: GFP production volumes in Europe, broken down by country / group of countries

(2009\* = estimated, Eastern Europe\*\* = Poland, the Czech Republic, Hungary, Rumania, Serbia, Croatia, Macedonia)

## **Natural Fibre-Reinforced Plastics and Carbon Fibre-Reinforced Plastics**

Glass fibres are still utilised for reinforcement in more than 90% of all composites in Europe. The specific properties of carbon fibres as well as natural fibres, however, basically offer the same future perspectives for these materials.

The selection of the “optimum“ material for each individual purpose depends on the price as well as on criteria such as strength, rigidity, fatigue strength, corrosion resistance, and elongation at break.

The typically higher price of carbon fibres as compared to glass fibres may pay off in conjunction with certain high-performance applications. Processors are delighted about the current availability of these fibres in the market and appreciate the basic opportunity of opening up new areas of application with carbon fibres. Natural fibres may be used to reduce the weight relative to that of glass, which is a benefit in certain applications. The associated disadvantages will have to be considered very carefully, considering the overall requirements and balancing the pros and cons. Carbon fibres, for instance, have a problem with elongation at break; while natural fibres, on the other hand, are associated with moisture absorption. Specific areas of application add to the substitution potential for glass fibres; for instance so-called WPC (wood plastic composites) for natural fibre - reinforced plastics that are opening up completely new markets for composites.

## **Outlook**

According to the estimation of all parties involved in the supply chain, production volumes in the GFP market will probably have to wait until 2013/2014 in order to return to the level of 2007 respectively 2008. This largely jibes with the general prognosis for the plastics industry during the next few years. Strategies followed in a bid to stem the worst financial turmoil of the economic crisis have prevented or delayed adaptation of employment structures at the companies to the current production situation respectively the orders placed. In many European countries, however, the composites market is expected to suffer some downsizing in 2010 (in Germany, for instance, this might happen after the government-funded short-time work programs have come to a stop).

Positive developments revealed by current business confidence surveys performed by umbrella organisations for the trade associations also pertain to the composites industry. Managers are frequently convinced that the “bottom of the economic recession“ has been hit – along with the sobering discovery, however, that only tentative growth may be realised for now, starting at a low level. This is particularly true of the core business of the companies.

This, however, calls for some differentiation, too. There are some requested projects in new markets that may lead to capacity shortages in case the order is actually placed.

The three primary challenges facing the composites industry, to be addressed in conjunction with the AVK’s strategic tasks as well, include:

## **1. Image and Popularity of the Materials in Question**

Application industries are still largely unaware of the benefits of these materials. Compared to “conventional“ materials such as steel, this sector of industry is still relatively young and pertinent marketing efforts may be enhanced. Little light is thrown on this matter even during formal (engineering) education; besides, final consumers and customers ought to be informed about the pertinent areas of application as well as products containing component parts made of composites.

## **2. Innovations**

Apart from being able to replace other materials, composites also have an enormous unexhausted potential for new products and new applications in existing as well as new markets. Continuous observation of trends as well as future markets should be enhanced, along with systematic innovation management at the respective companies.

## **3. Sustainability**

In terms of “holistic“ sustainability, composites often / usually have certain advantages over competitive products, as far as the entire product life cycle is concerned. Comparative, technically consistent analyses placing equal emphasis on ecological, economical, and social factors often reveal that composites have a definite “cutting edge“.

A more detailed analysis of these challenges with regard to individual companies as well as in a cross-company context (for instance for the entire Federation) reveals favourable perspectives and growth opportunities for companies throughout the composites market during the next few years.

## **The Author**

Dr. Elmar Witten is Managing Director of the AVK - Industrievereinigung Verstärkte Kunststoffe (Federation of Reinforced Plastics). The AVK, as a professional association for fibre composite plastics/composites, represents the interests of producers and processors of reinforced and filled plastics on a national and a European level. Nationally, the AVK is one of the four pillars of the GKV - Gesamtverband Kunststoffverarbeitende Industrie and an international member of the European composites confederation EuCIA – the European Composites Industry Association. In these organisations, Dr. Witten represents the AVK's interests as a member of the extended management (GKV) resp. the board (EuCIA).