

The European Market for Fibre Reinforced Plastics / Composites in 2021

The AVK – Industrievereinigung Verstärkte Kunststoffe – has published its annual market report for fibre reinforced plastics/composites. The composites market almost returns to pre-crisis levels in 2021.

After a long period of growth from 2013 to 2018, the corona pandemic, which began in February 2020, as well as other negative factors have severely impacted not only the economy as a whole, but the industrial sector and composites market in particular. European composites production volumes declined by more than 15 % in the period from 2018 to 2020. **In 2021, this trend was clearly reversed.** With growth of 18.3 %, the market almost returned to its pre-crisis level. The increase was thus significantly higher than overall growth in the EU at 5.3 %.

This press release is a summary of the full market report which can be downloaded free at www.avk-tv.de

Markets reviewed in this report

In its consideration of glass fibre reinforced (GRP) materials, the analysis presented here again includes all GRPs with a thermoset matrix as well as all thermoplastic materials with long or continuous fibre reinforcement. The market figures for NCF (non-crimp fabrics) and the European production volume for short fibre reinforced thermoplastics have been added to the scope of this report.

Overall development of the composites market

The volume of the global composites market totalled 12.1 million tonnes in 2021, according to the latest figures from the JEC (www.jeccomposites.com). In 2021, European composites production volume increased by 18.3%. The total European composites market thus comprises a volume of 2,962,000 tonnes (see Fig. 1). Overall, market momentum in Europe was significantly higher than in the global market. Europe's share of the world market is around 25 %, similar to that of the USA. Asia now accounts for around 50 % of global production.

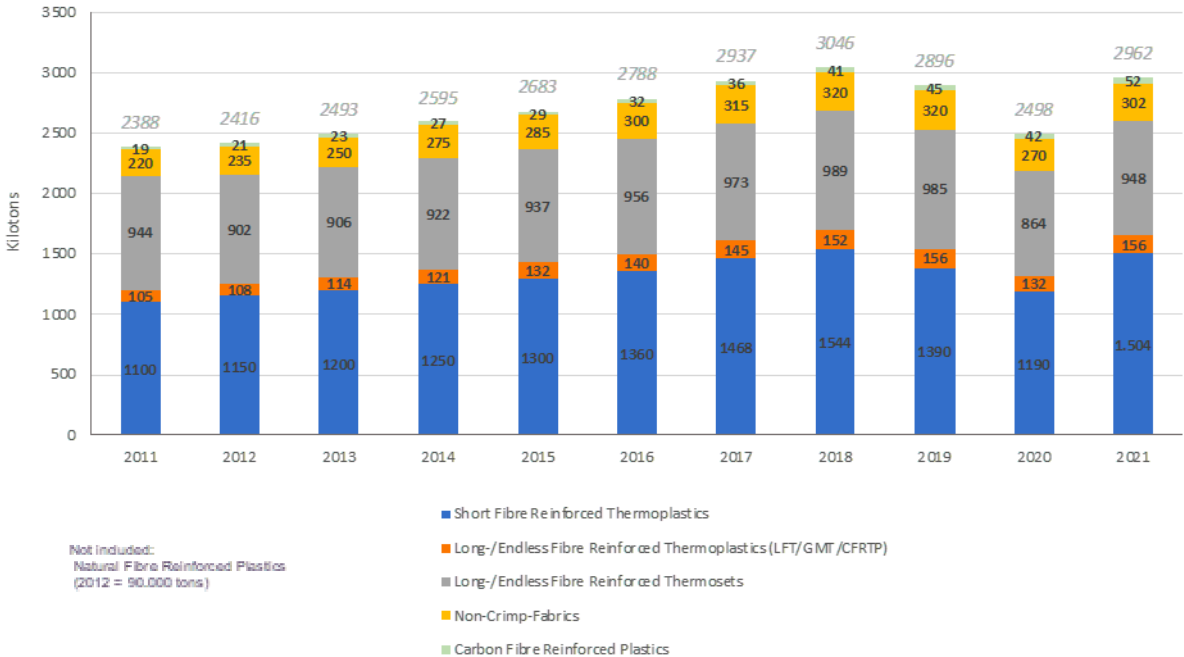


Fig. 1: Composites production volume in Europe since 2011 (in 000 t)

In terms of volume, the largest share of total composites production (> 50 %) is used in the transport sector (see Fig. 2).

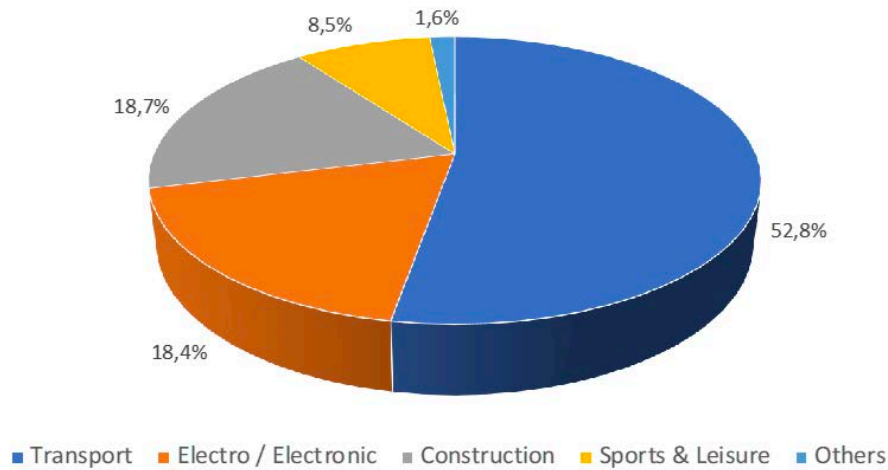


Fig. 2: Total composites market by application in 2021 (in %; excluding CRP)

Development of the thermoset composites market

In 2021, total production volume of thermoset composites was 1,250,000 tonnes. This class of materials thus accounted for 43 % of the total market in Europe.

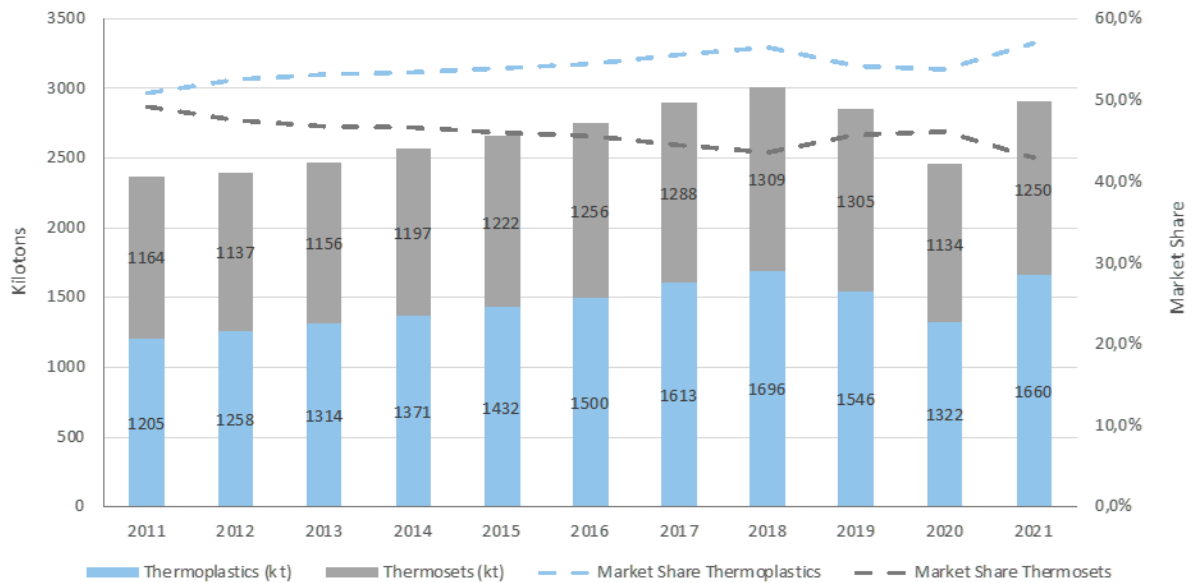


Fig. 3: The European composites market by material system (in % and kilotons; excluding CRP)

The two main application areas for thermoset composites remain the construction / infrastructure and transport sectors (Fig. 4).

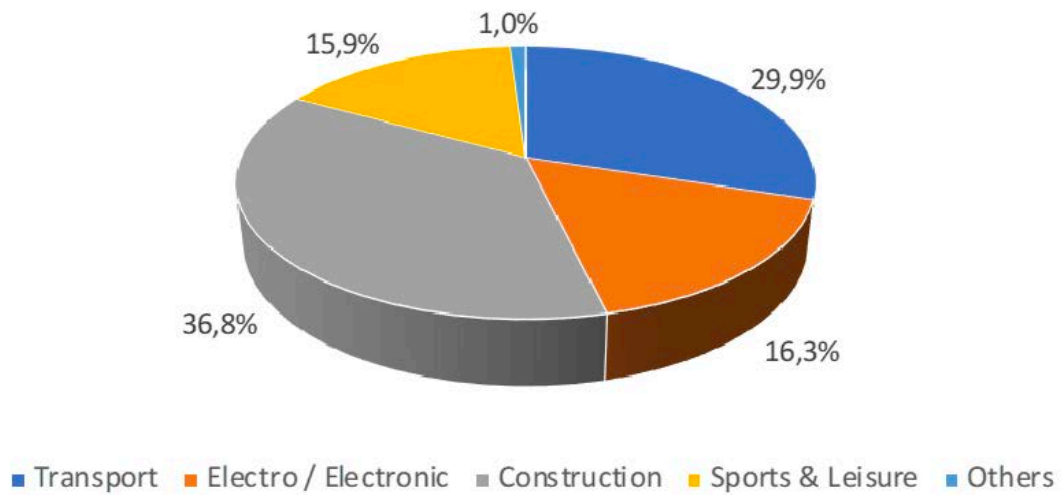


Fig. 4: Thermoset composites by application area in 2021 (in %; excluding CRP)

Development of the thermoplastic composites market

The thermoplastic composites market in Europe accounted for a total volume of 1,660,000 tonnes in 2021 (source: AMAC). The market share of these systems in the total European market was thus 57 %. The main area of application for thermoplastic composites is the transport sector, which accounts for more than 2/3 of the market (see Fig. 5).

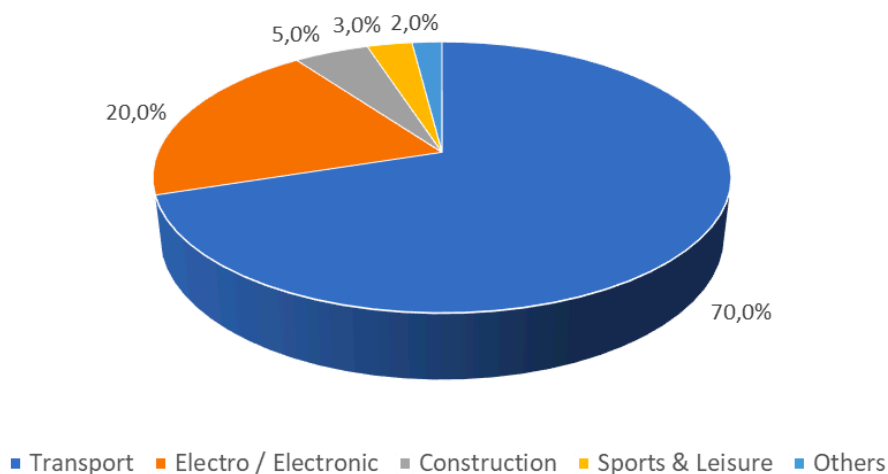


Fig. 5: Thermoplastic composites by application area in 2021 (in %)

Trends in the development of processes/components

Table 1 shows the trends in the production volume of essential processes/parts for composites production over recent years.

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|--------------|--------------|--------------|--------------|--------------|
| SMC (kt) | 202 | 204 | 205 | 174 | 197 |
| BMC (kt) | 78 | 81 | 82 | 70 | 81 |
| SMC/BMC (kt) | 280 | 285 | 287 | 244 | 278 |
| Hand lay-up | 140 | 140 | 139 | 121 | 135 |
| Spray-up | 98 | 99 | 98 | 88 | 97 |
| Open mold (kt) | 238 | 239 | 237 | 209 | 232 |
| RTM (kt) | 146 | 148 | 148 | 131 | 138 |
| Sheets | 93 | 96 | 94 | 85 | 92 |
| Pultrusion (kt) | 53 | 55 | 56 | 50 | 56 |
| Continuous processing (kt) | 146 | 151 | 150 | 135 | 148 |
| Filament winding | 78 | 79 | 78 | 70 | 72 |
| Centrifugal casting | 67 | 69 | 68 | 60 | 65 |
| Pipes and Tanks (kt) | 145 | 148 | 146 | 130 | 137 |
| Non-crimp fabrics (kt) | 315 | 320 | 320 | 270 | 302 |
| Others (kt) | 18 | 18 | 17 | 15 | 15 |
| Total Market Thermoset (kt) | 1,288 | 1,309 | 1,305 | 1,134 | 1,250 |
| GMT (kt) | 35 | 36 | 36 | 29 | 27 |
| LFT (kt) | 103 | 108 | 111 | 93 | 119 |
| CRTP (kt) | 7 | 8 | 9 | 10 | 10 |
| Short fibre (kt) | 1,468 | 1,544 | 1,390 | 1,190 | 1,504 |
| Total Market Thermoplastics (kt) | 1,613 | 1,696 | 1,546 | 1,322 | 1,660 |
| CRP – Carbon Fibre Reinforced Plastics | 36 | 41 | 45 | 42 | 52 |
| Total Composites Market (kt) | 2,937 | 3,046 | 2,896 | 2,498 | 2,962 |

Table 1: Composites production volumes in Europe according to processes/components

NCF – Non-Crimp Fabrics

Over the past ten years, this market segment (included here for the first time) has grown by almost 40 %. While the market level in 2011 was still 220,000 tonnes, it will reach 302,000 tonnes in 2021. The main areas of application are the wind energy industry and boat and ship building. However, these materials also have a number of special applications in the areas of transport/public transport, sports and leisure, and construction and infrastructure.

SMC/BMC

Production of SMC (sheet moulding compound) and BMC (bulk moulding compound) components is the second largest market segment of the thermoset GRP industry with a total volume of 278,000 tonnes. In 2021 this sector grew by 13.9 %. Alongside thermoplastic systems, this market segment has thus seen the strongest growth.

Open processes

With total production of 232,000 tonnes, “open processes” – hand lay-up and spray-up – continue to be one of the largest segments in the European GRP market. In 2021, this market segment grew by 11 % overall.

RTM

After a period in which RTM processes were unable to significantly increase their market share, slightly above-average growth of 11 % is also indicated here for 2021. The total volume in this processing segment rose to 138,000 tonnes. Despite this positive development, the segment did not quite return to its pre-crisis level in 2021.

Continuous processes

The volume of GRP components produced using continuous processes grew by 9.6 % in 2021 – slightly below the average rate of growth for the industry. Overall, the production level for pultrusion products increased by 12 % to a volume of 56,000 tonnes.

Pipes and tanks

The market segment for GRP pipes and tanks grew by 5.4 % this year – well below the average for the market as a whole. GRP pipes and tanks are principally used in plant construction and public/private pipelines as well as by customers in the oil/gas and chemicals industries.

LFT/GMT/CFRTP

In 2021, the market for GMT was the only market segment that did not grow at all and, indeed, declined by 6.9 %. LFTs, in contrast, grew by 28 % to a total volume of 119,000 tonnes.

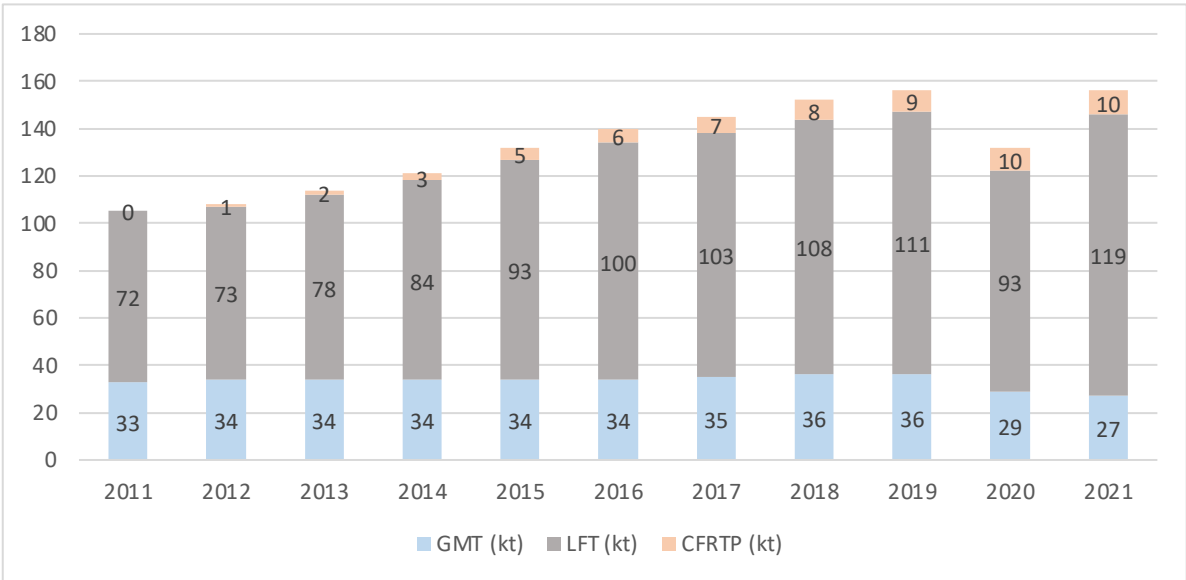


Fig. 6: Market development for LFT/GMT/ CFRTP (in 000 t)

Short fibre reinforced thermoplastics

The European market for short fibre reinforced thermoplastic materials grew at a rate of 25.6 % in 2021. Production rose to 1,504,000 tonnes making this by far the largest single segment in the composites industry (source: AMAC).

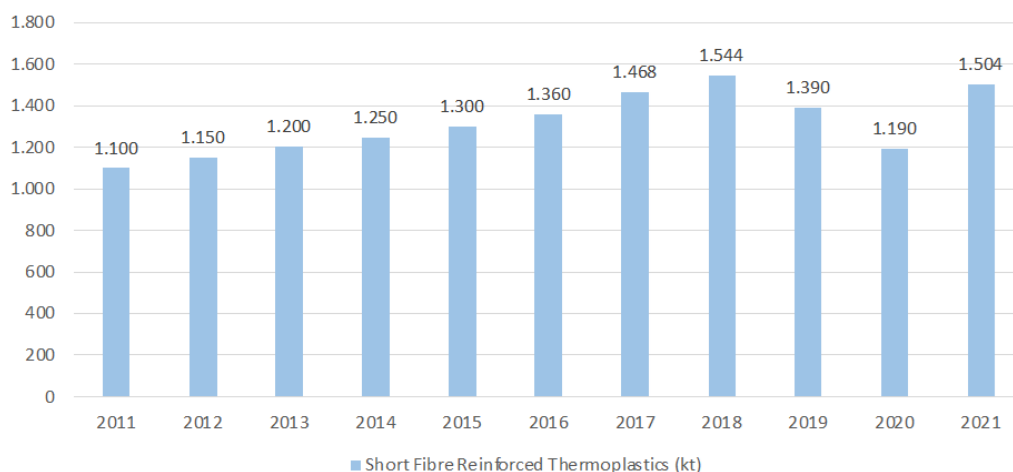


Fig. 7: Market development of short fibre reinforced thermoplastics (in 000 t)

Regional market developments

The German thermoset market achieved a volume of 242,500 tonnes in 2021. With a share of 19.4 %, Germany thus remains the largest market (see Fig. 8). Eastern Europe is in second place with a market share of 18.1 % and a volume of 226,500 tonnes. This region includes the following countries: Poland, Czechia, Hungary, Romania, Serbia, Croatia, Macedonia, Latvia, Lithuania, Slovakia and Slovenia.

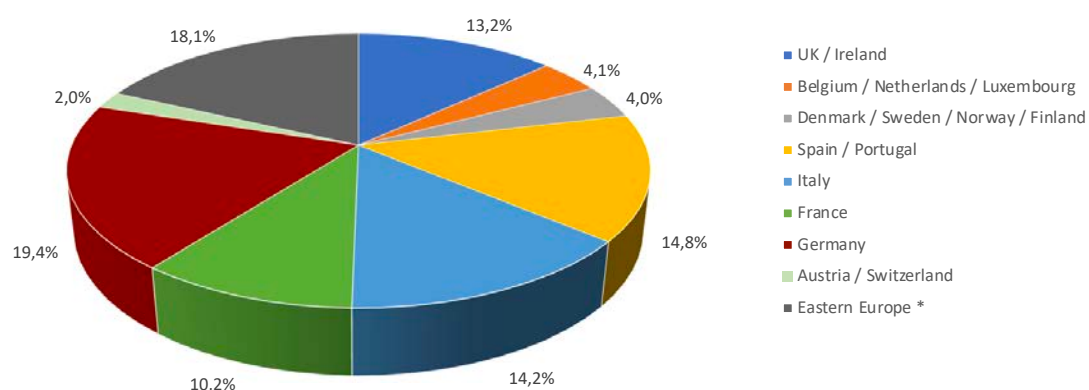


Fig. 8: Regional distribution of the European thermoset market

Other composite materials – CRP and NRP

In addition to the material groups discussed so far, carbon fibre reinforced plastics (CRP) and natural fibre reinforced plastics (NRP) are the most important material groups in terms of volume.

CRP market volume grew very dynamically in 2021, increasing by 23 % compared to 2020. The global market volume increased to 147,500 tonnes, of which Europe accounted for approx. 1/3. The total volume in Europe increased to 52,000 tonnes (source: Composites United).

No new information is currently available for NRP. According to an AVK survey conducted within the NRP sector in 2020, this special composites segment primarily uses thermoplastic materials, although thermoset materials are also used. Unfortunately, no current figures regarding the precise volumes being processed are available. However, it can be assumed that the market for these materials in Europe is at least 90,000 tonnes. The last survey of production volumes, for 2012, recorded a volume of 92,000 tonnes of NRP (source: nova-Institut GmbH).

Outlook

Global economic and political events currently make it extremely difficult to predict possible future economic development scenarios and thus the trends for the composites market in Europe, either as a whole or for a particular region.

Germany's transition to renewables accelerated enormously after the nuclear catastrophe in Japan in 2011. This, in turn, increased demand for new forms of energy and the infrastructure to provide them. Wind energy plays a central role here, especially in Germany, but also in other European countries. This is expected to increase considerably over the coming years, both in Germany and Europe.

The area of mobility is also closely linked to energy supplies. Prices for gasoline and diesel have risen enormously in recent months. There are many reasons for this. The expansion of charging infrastructure for electric vehicles also opens up exciting new

horizons for composites. Durability, low maintenance and weather resistance are key requirements in this area and composites seem likely to benefit here as well.

As a final example, consider the corona pandemic. The impact of the virus was the most severe event since the economic and financial crisis of 2008/2009. Within the composites industry, the transport sector was particularly hard hit. The aviation industry collapsed almost completely and is recovering only slowly.

Almost all industries are currently struggling with extremely high raw material and logistics prices. Here, too, specific events have exacerbated existing situations. International logistics chains had already been weakened by the corona pandemic.

Despite all the imponderables, one thing is absolutely clear: it is virtually impossible to predict long-term developments – there are simply too many unknown factors at play. However, there are certainly many fields of application for which composites – with their unique properties and outstanding capabilities – seem almost predestined.

Going forward, we expect positive developments, above all, in the wind energy and commercial vehicle sectors. But infrastructure applications also offer many opportunities and possibilities, such as in the aforementioned expansion of the charging station infrastructure and the urgently needed construction and renovation of bridges. These areas are supplemented by the expansion of the 5G network, where experts see a high level of benefits for the use of composites.

Overall, the composites industry must be even more successful in promoting the advantages of the materials, not just their lightweight properties, to decision-makers. Corrosion resistance, design freedom, options for load-bearing construction, high strength and rigidity, durability, low maintenance – these are just some of the advantages that need to be more widely understood. The future holds many opportunities, some of which have yet to emerge as the developments of recent years have shown. Composites are materials of the future. The goal must be to ensure they are considered in all material selection processes.

More detailed information as well as additional graphics can be found on the AVK website at www.avk-tv.de.