

Press release

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Natural fibre-reinforced plastics: establishment and growth in niche markets

More than 30 compound companies produce over 80,000 tonnes of granulates with wood and natural fibres in Europe 2017 – new producers with major growth plans. World's largest conference and exhibition on biocomposites in December in Cologne (www.biocompositesc.com).

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There are many reasons to fill or reinforce plastics with wood or natural fibres of all kinds. Optical and haptic reasons play a role when it comes to differentiating products from standard plastic products. Especially in household, consumer goods and toys are optics, haptics and green image important considerations. Weight savings, shorter cycle times, scratch resistance and a lower CO₂ footprint play a crucial role in technical applications and in the automotive industry. And, in combination with biodegradable plastics, products are also manufactured for agriculture and horticulture as well as for special applications such as filter balls and coffee capsules. Today, in addition to experienced component manufacturers who have been offering a wide variety of biocomposites for years, there are new suppliers on the market who want to use innovative technologies to produce and market even better granulates.

Over 30 compound producers from Europe offer hundreds of recipes

In total, more than 30 compound producers from Europe with different polymers and natural fibres are currently producing several hundred recipes. Common petrochemical plastics are PP, PE, PVC and TPE/TPS. More and more often biopolymers such as Bio-PE, PLA, PBS, PBAT or PHA are used. Depending on the target application, natural fibres also contain wood flour, wood fibres, cellulose fibres, bast fibres such as hemp, flax, jute or kenaf, but also bamboo, cork or the fibres of the sunflower seed shells. The fibre content for injection moulding granulates is usually between 20% and max. 50%, with extrusion contents of up to 80% are possible.

At Fakuma in Friedrichshafen, Germany, the world's largest plastics and granulate trade fair, more than 20 exhibitors offering biocomposites were among the nearly 1,900 exhibitors in October 2017.

The following table tries to list the most important European suppliers of wood and natural fibre filled and reinforced plastic granulates with their production quantities in 2017. Only a few manufacturers are able to produce and sell quantities of 10,000 t per year or more. The largest producer is the Portuguese company Amorim with its cork granulates, which are used in shoe soles, handles and even in space travel. Many producers are still under 1,000 t/year or even only 500 t/year, although some of them, marked in the table with "NEW", have very substantial growth plans. Over the next few years, additional capacities of more than 50,000 to 300,000 tonnes are planned to be built. This estimation might not be unrealistic as quality and prices

have improved steadily over the last few years and many granulates have an attractive price-performance ratio today.

On the other hand, new producers have not succeeded in establishing quantities of more than 20,000 or even 50,000 t/year on the market in recent years. For this reason, some players have withdrawn from the market (Borealis, A. Schulman), while others have corrected their plans downwards significantly (Mondi, PolyOne, UPM).

Major producers and suppliers of wood and natural fibre filled and reinforced plastic granulates with their production quantities in Europe in 2017

Granulate Producer	Country	Polymers	Fibres	Production 2017
AMORIM	PT	PP, TPE/TPS	Cork	20.000 – 50.000
Beologic	BE/AT	ABS, PC, PE, PHA, PHB, PLA, PMMA, PP, PS, PVC, SAN, TPE	Wood and natural fibres and others	10.000 – 20.000
Tecnaro	DE	Lignin, PE, PP, PLA, PP, PBS, PBAT	Wood and natural fibres	5.000 – 10.000
Advanced Compounding	DE	PA, PE, PP	Wide range of natural fibres	1.000 – 5.000
Golden Compound	DE	PP, Biopolymers	Fibres from sun flower shells	1.000 – 5.000
Jelu Werke	DE	PP, Biopolymers	Wood and natural fibres and others	1.000 – 5.000
Pinuform	DE	PE	Wood	1.000 – 5.000
Plasticwood	IT	PP	Wood	1.000 – 5.000
Biowert	DE	PE, PP, PLA	Grass fibres, flax	500 – 1.000
Hexpol	SE	TPE	Cork	500 – 1.000
UPM	FI	PP	Cellulose fibres	500 – 1.000
Werzalit	DE	PP	Wood	500 – 1.000
Addiplast	FR	PP	Wood and natural fibres, cellulose fibres	< 500
Aqvacomp	FI	PP	Cellulose fibres	< 500 NEW

FKuR	DE	Bio-PE, Bio-PET, PHA, PLA, PP	Bamboo, wood	< 500
GreenGran	NL	PP, biopolymers	Natural fibres	< 500
HempFlax	NL	PP, PLA	Natural fibres	< 500 NEW
Linotech	DE	PP, PLA	Wood and natural fibres	< 500
Mondi Paper	AT	PP	Cellulose fibres	< 500
PolyOne	USA/EU	PP	MDF wood fibre	< 500
Sappi	SA/DE	PP	Cellulose	< 500 NEW
Transmare	NL	PP, PLA	Wood, bamboo and natural fibres	< 500
WIS Kunststoffe	DE	PP	Wood and natural fibres	< 500
Total	EU			80.000

Number of applications and total production continues to rise steadily

Overall, it is clear that the number of applications and total production are increasing, but growth rates are lower than expected and total volumes are only slowly moving into larger dimensions.

The nova-Institute's current estimate is around 80,000 tonnes of natural fibre granulates produced in Europe in 2017, which would mean a threefold increase compared to 2012. However, it may take a few more years before quantities of several hundred thousand tonnes are reached.

The following examples illustrate the ongoing establishment of the market as well as a large number of new, attractive applications.

IKEA (Sweden) has reintroduced the WPC chair “PS 2012”, but now with a significantly improved WPC granulate (Wood-Plastic Composite). In addition, the company also offers other products made of wood-plastic composites, including picture frames and another chair “ODGER” made of a wood-plastic composite. The special feature of this chair is that no tools are required to assemble the chair - the seat and base are easily assembled by a simple mechanism below the seat. The chair's matrix material is a recycled plastic material.

There is also a new application in the consumer electronics sector - in a product group where acoustic properties are key to success. With LG Electronics using the cellulose-based granulate Aqvacom, for the first time one of the market leaders utilizes a biocomposite material for the production of speaker cabinets. The material shall also be used in the automotive industry in the future. The cellulose-based granulates from the South African company Sappi are also targeting this market.

Advanced Compounding from Germany produces naturally antibacterial granulates made of PLA and pine wood, which are used for door handles and toys. Other innovations include the use of pine chips in industrial bread baskets and antibacterial packaging for shampoo bottles.

Mock brings its new grain mill "Mockmill 100" with a casing made of Tecnar's PP-wood granulate to the market. Until now, Mock has not used any plastics for its casings, but only wood.

The Belgian compounder Beologic demonstrated the use of recycled materials at Fakuma in form of flower pots made of recycled denim fibres and also as wine coolers and crates for grape harvest made of grapevine granulates.

Biocomposites Conference Cologne (BCC)

In December, the unique opportunity to gain a comprehensive overview of the world of biocomposites will be offered in Cologne. The "Biocomposites Conference Cologne (BCC)" (www.biocompositesc.com), the world's largest conference and exhibition on the topic, will take place in Cologne on 6 and 7 December. 300 participants from 30 countries and more than 30 exhibitors are expected. In addition to the biocomposites presented in this article, there are further processes such as direct extrusion, compression moulding, 3D printing or various thermosetting processes. In total, around 400,000 tonnes of biocomposites are already used in Europe every year, especially in the construction, furniture, automotive and consumer goods industries.

There is considerable interest in biocomposites from various parts of the industry. Special appearance and haptic, green image, weight savings, shorter cycle times, scratch resistance and, above all, a lower CO₂ footprint are important factors for this development. The following international companies will be present at the conference: Avantium, BASF, Cordenka, Coperion, Covestro, DONG, Ford, nobilia, Renolit, Södra, Solvay, Stora Enso, Tesa, TransFuran, Velux, VW and Werzalit.

At the conference, the "Biocomposite of the Year 2017"-Award will be selected from six nominated products. Detailed information on the candidates can be found at: www.biocompositesc.com/award

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