

Hardheim, September 2017

EIRICH granulating technology for the conditioning of short carbon fibers

Carbon fibers in the form of continuous fiber fabrics or cut fibers are used to strengthen and reinforce other materials, such as plastics. Plastics like epoxy resin can be reinforced, which is used in large quantities in the aviation industry. Short fibers are produced from production leftovers, but this material needs to be conditioned via granulation before it can be put to further use. EIRICH technology is perfect for this task.

Large quantities of so-called carbon fiber prepregs are used in the manufacturing of commercial aircraft. Prepregs are a type of semifinished material that is made of a fiber matrix that has been impregnated with reaction resins, and they are hardened under high temperature and pressure in order to manufacture components. A continuous fiber is generally used, but cut fibers can also be used in individual cases. The weight share of prepregs can make up as much as 50% of the weight of the aircraft. The proportion of production leftovers that can be reused in the form of short carbon fibers is correspondingly large. The recycled material is e.g. added to thermoplastic or duroplastic materials in order to increase their strength and stiffness. The advantage over new carbon fibers is the significantly lower price.

In order to process the hardened prepreg leftovers, they are cut or ground, e.g. to fiber lengths below 500 µm. Naturally, a certain amount of dust is produced in the process. The fibers tend to form clumps, and the demixing that occurs makes accurate feeding very difficult. This is why it is advantageous to improve processability of the ground fibers through granulation.

And this is where the advantages of EIRICH mixing and granulating technology come into play. For granulating, preferably very small amounts of liquids are added in which binding agents are either dissolved or suspended. In the sizes used for granulating, the EIRICH mixer has only one moving mixing tool, the so-called rotor, which can run at a

Hardheim, September 2017

tool speed of up to 30 m/s. This makes it possible to generate high shear forces and distribute liquids quickly and uniformly.

As a result, dust-free granulates that offer good flowing properties and are easy to feed are manufactured from cut or ground fiber leftovers. Another advantage: The system-related properties of the EIRICH mixing technology also make it easy to scale up this solution, with the process parameters originally determined in the EIRICH test center being transferable to larger production machines.

Given the increasing usage of prepregs in other industries as well, it is to be expected that the volumes of leftovers that need to be recycled will increase. In the same way it is also possible to recycle e.g. plastic fibers.

For interested parties, EIRICH offers the opportunity of a demonstration to show off the possibilities of granulate production or the homogeneous and non-destructive mixing of fibers into a matrix, which is important for friction lining mixes. Test center equipment is available for this purpose at all company sites. The tests are initially performed on 5-liter laboratory mixers, and this is then ramped up to production on an 80, 150 or 400-liter mixer under near-production conditions. Production mixers are available in different sizes from 80 to 12,000 liters, if required also with Ex-proof equipment. The results form the ideal basis upon which decisions can be taken about commercial production.

More information: North American Contact: Chris Clark, email: cclark@eirichusa.com

Contact: Marcus Mueller, e-mail: marcus.mueller@eirich.de (outside of NA)

The EIRICH Group, with Maschinenfabrik Gustav Eirich as its strategic center in Hardheim, is a supplier of industrial mixing, granulating/pelletizing, drying and fine grinding machinery, systems and services. EIRICH has core expertise in processes and techniques used for the preparation of free-flowing materials, slurry and sludge. The main applications for these processes are in the ceramics, refractory, foundry, construction materials, plaster, rechargeable battery, battery compound, fertilizer, glass and ore dressing industries. Close co-operation between our own test centers around the world and collaboration with the research and academic community enables the "hidden champion" to provide solutions for innovative,

Press release



Hardheim, September 2017

cost-efficient products and processes. The family-managed company was founded in 1863 and operates from twelve locations on five continents.