New generation of composite materials made from layered fibres

Development status

Phase 3

Technology validation and implementing it in real environment. Testing the technology outside of the laboratory and its adjustment to external conditions.

IP protection status

Patent No. 307301

Partnering strategy

Collaboration, licensing

Institution

Tomas Bata University in Zlín

Vlastník

Univerzita Tomáše bati ve Zlíně

Challenge

Composite materials play an important role in various applications such as constructional elements of transport or medical applications. The unique physical-mechanical properties come from the structure, where the particles are dispersed in a matrix and thus the composite acquires new properties that do not have any of its components. The normal production of composite materials has to face with the problems of optimal dispersion of particles and optimal cohesion between components of the composite therefore a new compact composite material has been developed. This material is produced by compressing or calendaring of fibrous material already containing dispersed particles. Homogenous distribution of the particles is ensured by a filtering mechanism. The main benefit of the technology of producing compact material with composite character is high variability and flexibility. The technology opens up new possibilities for waste filter processing as well as elimination of waste materials.

Description

New generation of composite materials and a method of its preparation present new technology and new material, which can be an alternative to common composite materials. The principle of this technology is that particles are trapped in the nonwoven fabric by the filtration process. Then the individual layers are compressed and/or calendared together into a compact material. This technology has a very high degree of flexibility. New material can be made from a wide material base and particles distribution can be controlled by filtering and fibre sizes. This technology can be used to the recycling of filters or targeted production of new materials with specific properties.

Commercial opportunity

The technology of compact material production is extremely flexible and simple. It can be used in the production of new materials based on a varied material base, for example it can be filled with particles of

biologically active, electrically conductive, woody meal, magnetic powders. The structure may also be influenced by the size of the nonwoven source fibers (micro, nanofibers), manufacturing process (pressing and/or calendaring) and the degree of compaction. This method is suitable for filter waste treatment. It can be used for drug carriers, the production of biodegradable materials or structural elements, special filters etc.