

Materials science and engineering | Automotive | Interior Design | Technology Portfolio

BIOFLEXI® HDF – High density fibreboard from agricultural residual fibres for free-form design

Application area

Fibreboards are widely used in the furniture industry and for internal house finishing. This new type of high-density fibreboard is equally suitable for the production of free-form furniture and partitions as well as slip-resistant and shock-absorbent floor covering and underlayment respectively. No formaldehyde and isocyanate components are applied, making it the ideal solution for various indoor applications.

State of the art

The disadvantage of using conventional wood fibreboards is that they are based on slow, non-annually renewable resources. Moreover, formaldehyde- or isocyanate-based resins are often used for the production of these boards. Both materials may pose serious health risks. Numerous conventional fibreboards are neither directly recyclable, nor compostable.

Innovation

Scientists from Stuttgart University developed a flexible high-density fibreboard made of annually renewable raw materials, which can be produced on the basis of available manufacturing methods.

The fibreboard consists of 80 % to 90 % straw, a natural fibre and residual material which is available worldwide. Therefore, the raw material's price is very low, and the fabrication of the fibreboard is not competing with food production. The fibreboards can be made of wheat, maize, rice, oat, barley or rye straw. In case of applying rice straw, the fibreboards have an extra advantage of having a silicate concentration of up to 20 % of the dry fibre weight. Since silicate is a natural fire-retardant material, the material classification "particularly fire-resistant" according to the German DIN 4102-B1 standard can be fully met through adding minimal mineral-based flame retardant-additives.

An eco-friendly thermoplastic elastomer is used as a binder. The board can therefore be produced without formaldehyde and isocyanate contents, thus minimizing the health risks during the product's entire life cycle. At the end of its service life, the fibreboard may be also recycled or composted. This indicates that waste is hereby prevented twice: once during the production by using agricultural by-products and the second time by composting the product at the end of its life-cycle.

Another unique feature which sets the invention apart from conventional fibreboards, is the board's high flexibility, which makes it the ideal solution for designing free-form furniture and interior spaces. Based on proven production methods, the boards are shaped as desired and then fixed by veneer-layers. Due to the low raw material costs involved, this invention provides an attractive alternative for architectural free-form applications.

Your benefits at glance

- ✓ Recyclable and compostable
- ✓ 80 - 90 % of the fibre is made of annually renewable raw materials which do not compete with food production
- ✓ No harmful additives
- ✓ Slip-resistant and shock-absorbent
- ✓ Free forms for interior design and furniture
- ✓ Inexpensive raw material (agricultural by-product)
- ✓ Manufacturing process based on proven methods used in the plastics processing industry



BIOFLEXI

Figure: Flexibility and coatability of the bio-based fibreboard Bioflexi® [image source H. Dahy, Uni Stuttgart].

Technology transfer

TLB GmbH manages inventions until they are marketable and offers companies opportunities for license and collaboration agreements.

Patent portfolio

EP2965882 B1 and validated in DE, FR, GB and NL; US10,137,596 B2 granted; patent pending in Malaysia.

Contact

Anne Böse, Business Development
boese@tlb.de
 Technologie-Lizenz-Büro (TLB)
 der Baden-Württembergischen Hochschulen GmbH
 Ettlinger Straße 25, D-76137 Karlsruhe
 Tel. 0721 79004-0, Fax 0721 79004-79
www.tlb.de

Reference number: 14/001TLB