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KALLE HEISKA
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From VTT: Bioplastic reinforced with natural fibres *Finland leads Europe in the development of renewing bioplastic*

VTT has made bioplastic durable due to reinforcement with natural fibres. This biocomposite, which is totally biodegradable, supports sustainable development. The waste costs for products made from this will be small, and in the future consumers will have an enhanced appreciation of biodegradability of materials.

VTT achieved this biocomposite using flax fibres to reinforce bioplastic. VTT also developed a method by which the properties of the completely biodegradable biocomposite can be tailored according to the projected use of the product. It is a further advantage that the new bioplastic products can be manufactured on the same machinery on which conventional plastic products which are only partially biodegradable are manufactured.



Tentative caption: Anders Södergaard, technology manager of the Dutch firm Hycail, is well up on the manufacture of durable entirely biodegradable plastic. Our picture is from the factory in Holland manufacturing lactic acid based raw material for bioplastic.

[High resolution image](#)

Photo: Hycail

The spearhead in the development of such flax reinforced completely biodegradable products has been in Finland, Sweden and the USA. VTT research succeeded in creating the desired mechanical strengths for bioplastic through an appropriate combination of bioplastic raw material and flax. The research also explored the resistance of the new biocomposite to heat, moisture and UV radiation, and further developed the manufacturing process.

Fibreglass has traditionally been used to reinforce plastics. This is difficult to recycle and there may be health hazards involved in handling it. In central Europe the car manufacturing industry especially uses flax fibres for reinforcement, but

mixed with non-biodegradable plastic raw material.

"Our company acquired knowledge suggesting that it would be good to continue working on product development and research in order to bring new, biodegradable

materials onto the markets. One year ago an EU norm was set for bioplastic, and in the next few years compostible packages are to come onto the markets of southern Europe. Finland is the leader in Europe for completely biodegradable bioplastic. Much of the credit is due to TEKES and its biopolymer programme," says **Anders Södergaard**, technology manager of the Dutch company Hycail and part-time professor of applied biomaterial sciences at the University of Turku.

The research work on biocomposites led by VTT was financed by TEKES, several companies and VTT. The companies specified the desired properties for bioplastic and the research work was accomplished chiefly by VTT, Tampere University of Technology, Åbo Akademi University and Hycail. Hycail has a pilot factory for lactic acid based bioplastic raw material producing 400 tons of raw material a year.

Further information



Photo: Katri Mäkinen

VTT Processes
Paula Haapanen,
research scientist
Tel. +358 3 316 3537
Tel. +358 40 527 7664
paula.haapanen@vtt.fi

Hycail b.v.
Anders Södergård,
technology manager
Tel. +31 6 2902 6000
sodergard@chem.rug.nl

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