

Press release - September 29, 2020

Pilot plant for the production of uniquely degradable bioplastic has started
Parties sign cooperation agreement

Five water boards, STOWA knowledge center, technology company Paques and sustainable waste and energy company HVC have signed an agreement to build a pilot plant in Dordrecht for the production of PHBV, a fully biodegradable and sustainable bioplastic. PHBV is made from organic waste streams such as sewage sludge, industrial waste water and food waste. With this pilot plant, the cooperation partners want to build a bridge to commercial production of PHBV.



Bacteria produce completely biodegradable bioplastic

In 2016, the five water boards - Brabantse Delta, De Dommel, Hollandse Delta, Scheldestromen and Wetterskip Fryslân - made the bioplastic PHBV in the pilot project "PHARIO" (PHA from RIOolwater) with the help of bacteria that purify wastewater. PHBV is a high quality natural polyester. This is completely degradable under natural conditions in soil and composting plants as well as in fresh and salt water.

The operation is as follows. Wastewater contains a lot of fatty acids and the sludge contains bacteria. Those bacteria "eat up" with the fatty acids. Like humans store fat in the body, these bacteria store PHBV. This PHBV is taken out, after which a powder remains. That powder can be used in various applications.

Applications

PHBV can be used in agriculture and horticulture, among other things. For example, biodegradable pots for the agricultural sector are tested in the pilot plant. As a result, it is no longer necessary to pot the crops during cultivation because the pot is naturally broken down. Another example is the application of PHBV in self-healing concrete for cellars and tunnels, for example. By adding it, cracks in the concrete are automatically closed again. An additional advantage is that in self-healing concrete in many cases less (shrinkage) reinforcement has to be used, which in turn contributes to cost reduction and less environmental impact.

Market development

After the PHARIO pilot project, it was investigated whether the product could be further developed by the market, but this turned out to be a little too early. The market for this type of plastic is currently developing and that is very promising. The plastics industry, which now often works with fossil plastics from petroleum, first wants to have sufficient material to test the processing and use. The pilot plant in Dordrecht will supply the material for this. Various partners are now going to test the material.

Operational at the end of 2021

The experience from the PHARIO project is combined in the pilot plant with the knowledge of partner company Paques. Together with Delft University of Technology, it is developing a technology to also extract PHBV from industrial wastewater. The pilot plant will be located at HVC's sludge processing plant in Dordrecht. It is expected to open at the end of 2021. In the meantime, a further inventory is being made of potential suppliers of fatty acids (the raw material for making PHBV) and organizations are being sought for other applications of PHBV.

Partners

Wastewater is an important source of energy and raw materials for water boards. Since 2007, the water boards have been working more intensively with each other and other partners to recover valuable substances such as biogas, cellulose, phosphate, alginate, biomass and thus also this sustainable bioplastic.

The project is being developed and realized by a partnership of the Energy and Raw Materials Factory (consisting of the water boards Brabantse Delta, De Dommel, Hollandse Delta, Scheldestromen and Wetterskip Fryslân), knowledge center STOWA, technology company Paques and sustainable waste and energy company HVC. Sludge Processing Noord-Brabant (SNB), AquaMinerals, TU Delft and Wetsus (knowledge center for sustainable water technology) support the initiative with further knowledge development



For the editors

Photo

The cooperation partners from left to right. Theo Schots (Brabant Delta), Leo Stehouwer (Dutch Delta), Gert van Kralingen (Scheldestromen), Paul Koemans (De Dommel) (replaced Jan Verhoeven), Otto van der Galiën (Wetterkip Fryslân), Stephan Bocken (Paques), Joost Buntsma (STOWA), Ronald Hopman (HVC).

The cooperation partners are standing on top of the active bacteria of the wastewater treatment, which will produce the bioplastic. The bioplastic pilot plant will be located at HVC's sludge processing plant in Dordrecht, visible in the background.

Photographer: Rob Kamminga

More information

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