

PROPHAX

Publieke samenvatting / Public summary

Aanleiding

Current use of plastic materials and products directly contributes to climate change due to fossil feedstock dependency and to (microplastic) pollution of land and sea. Nevertheless, the low production costs, high versatility and lightweight nature of plastic materials have progressed human welfare extensively. This shows that there is a need for a transition towards plastic products that do not accumulate in the natural environment. These new biobased and biodegradable materials are especially required in applications that are used in direct contact with soil and remain in this environment once they have fulfilled their primary function. A prominent example of such a product are prefabricated vertical drains (PVDs) that are used to consolidate the moisture levels in land that is being prepared for construction. As buildings are being built on top of these PVDs there is no opportunity to remove and subsequently recycle them after use. This means they will persist for the full lifetime of the building and during this time might emit (micro)plastic fragments into the soil. Replacing these products with a biobased and biodegradable alternative is therefore the main project driver.

Doelstelling

The goal of this project is to study the technical feasibility and applicability of PHA-X for PVDs that are processed via profile extrusion. The project will develop different types of PHA-X which will be analysed on its processing potential and modified via polymer compounding to make it suitable for profile extrusion processes. As a final step in the

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Algemene informatie / General information

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Stichting Wageningen Research

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project, a first pilot production trial will be executed to test the applicability and functionality of PHA-X for PVDs. This project contributes to the goals of EKOOP D3 Biobased sub-theme 3.1 that covers the application and circular development of biobased polyesters at a multi kilogram scale using industrial production processes. In this project, biobased PHA-X based materials will be used to develop PVDs that are used to accelerate the consolidation of soil with high moisture contents. This is an essential procedure to allow for the effective building and construction at these locations. The project will establish the most optimal material formulation for this product category and then develop the first demonstrator products made from PHA-X within the facilities of Wicks at 200 kg scale.

Korte omschrijving

In this project Wageningen Food & Biobased Research (WFBR) teams up with Paques Biomaterials (PBM) and Wicks BV. PBM will be responsible for the production and pretreatment of PHA-X using different feedstocks and process parameters. They will supply different types of PHA-X for further material development and optimization. WFBR will use the supplied PHA-X for the formulation and production of new materials and compounds and will perform the analysis and optimization of their processing and functional properties. WFBR will perform lab scale profile extrusion trials and facilitate the scale-up of the compound development to allow for enough test material for product development trials. These trials will be performed at one of the industrial production locations of Wicks BV at a 200kg scale. Developed test PVD products will be tested on their functionality at an industrial testing site by Wicks. In parallel, monitoring of the biodegradation of these test products will be performed by WFBR. All partners will actively contribute to dissemination of project results in the public domain.

Resultaat

The results of this project will be: • Generation of new knowledge on how PHA-X with different functional properties can be prepared via mixed

culture fermentation processes • Knowledge and validation of newly developed PHA-X based compounds and materials suitable for profile extrusion • A first demonstration PVD product that is tested in outdoor environments • Public dissemination of the most important project results via a minimum 1 research paper, 1 article in a popular scientific journal and 2 presentations at national or international conferences relevant to the field

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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