



General information	
PPP-number	AF-17037
Title	Koolhydraat gebaseerde schuimen als duurzame vervanger voor Expanded Polystyreen ALTERNATIVE TITLE: Carbohydrate based foam as new sustainable thick-walled packaging material
Theme	Biobased Economy
Implementing institute	Wageningen Food & Biobased Research
Project leader research (name + e-mail address)	Fresia Alvarado Chacon Fresia.alvaradochacon@wur.nl
Coordinator (on behalf of private partners)	Mark Geerts geertsm@paperfoam.com
Project-website address	https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksprojecten-LNV/Expertisegebieden/kennisonline/Koolhydraat-gebaseerde-schuimen-als-duurzame-vervanger-voor-Expanded-Polystyreen.htm
Start date	January 1 st 2018
Final date	June 30 th 2020

Approval by the coordinator of the consortium	
The annual report must be discussed with the coordinator of the consortium. The "TKI's" appreciate additional comments concerning the annual report.	
Assessment of the report by the coordinator on behalf of the consortium:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not approved
Additional comments concerning the annual report:	Worldwide governments and the general public has become aware of the need to replace plastic packaging by more sustainable products. For table ware this has already resulted in legal bans. For light weight products a real shift to paper based packaging materials has taken place. For heavier products there is not yet an alternative, although some cities have already banned polystyrene. The thick walled packaging material from this project can help in this transition. And compared to paper based solutions, the environmental footprint is expected to be much better.

Summary of the project	
Problem definition	In the market of heavier electronic devices, housekeeping appliances or packaging of e.g. garden furniture, there is the need for a thick bio-based material with an acceptable price that can replace commonly used oil based plastic foams.
Project goals	In this project, the partners aim to develop (a new technology for the production of) thick-walled starch based packaging materials suitable for heavy products. This new material will be a green alternative for current oil based materials.

Results

Planned results 2019	<ul style="list-style-type: none"> • Analysis of feasibility and properties of each combination technique/raw material for the three chosen routes to produce thick walled starch based foamed packaging materials. • Trials to produce enough materials and compare the three routes will be done • Testing of materials produced via three routes • Reporting results • Decision on <i>one route</i> to be continued.
Achieved results 2019	Three different routes to produce thick walled, starch based foamed products have been explored. <u>2 cm thick products</u> could be obtained with <i>two of the explored techniques</i> in potentially up-scalable processes. Two of the techniques are promising and it was decided to continue explorative research in both directions. 1) Batch-wise process, relatively fast implementation. 2) Innovative continuous process, with a longer time to market. In both directions reproducible and stable processes were designed and realised.
Planned results 2020	<ol style="list-style-type: none"> 1) Optimization and testing of different formulations for both routes 2) Empirical translation of the mechanical testing properties to possible application requirements 3) Proof of principle of production of plane shaped products in continuous process 4) Report

Deliverables/products in 2019 (provide the titles and /or a brief description of the products/deliverables or a link to a website.)
<u>Scientific articles:</u> --
<u>External reports:</u> --
<u>Articles in professional journals/magazines:</u> --
<u>(Poster) presentations at workshops, seminars, or symposia.</u> --
<u>TV/ radio / social media / newspaper:</u> --
<u>Remaining deliverables (techniques, devices, methods, etc.):</u> Since there are possibilities of filing a patent, external communication is limited and postponed till patent is filed. Two important techniques have been developed within this project: <ul style="list-style-type: none"> - Compression test methods for foamed samples produced under different conditions and with different forms. - Imaging techniques to determine bubble size distribution of starch based foams.

<https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksprojecten-LNV/Expertisegebieden/kennisonline/Koolhydraat-gebaseerde-schuimen-als-duurzame-ervanger-voor-Expanded-Polystyreen.htm>

<https://topsectoragrifood.nl/project/af-17037-koolhydraat-gebaseerde-schuimen-als-duurzame-ervanger-voor-expanded-polystyreen/>