Co-financed by Greece and the European Union

Development of a textile with Silica coating for environmental friendly control of insects in agricultural production

Deliverable [14]:

[Batches of coated textiles]

[P&S]

This project is co-financed by the European Union and Greek national funds through the bilateral Greece-Germany S & T Cooperation Program, Competitiveness, Entrepreneurship & Innovation (EPANEK) (project code: T2DGE-0120).

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Project Details:

Programme: **Bilateral Greece-Germany S&T Cooperation Program, Competitiveness, Entrepreneurship & Innovation**

Call topic: **Agrofood**

Project Title: **Development of a textile with Silica coating for environmental friendly control of insects in agricultural production**

Project Acronym: **AgriTexSil**

Proposal Number: **T2DGE-0120**

Time Frame: **29/05/2018 – 28/04/2021**

Deliverable Details

WP: [5 Development of a textile coating process]

Task(s): [5.2 & 5.3]: [Plasma coating & Comparative tests with alternative melting methods]

Deliverable Title: [Batches of coated textiles]

Lead beneficiary: [P&S]

Involved Partners: [ThraceNG]

Deadline for delivery: month [17], [30/4/2020]

Date of delivery: [00/00/2019]

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1. Summary

In this deliverable, is described the P&S coated mesh 50 fabrics with different diameters of silica particles. The grades Syloid ED3 (average particle size 5.8 microns) and Syloid ED5 (average particle size 9.0 microns) are used as alternative to the S200 (average particle size 3.0 microns)
The specified plasma and delivery parameters were adjusted to the requirements of the mesh 50 fabric, provided by ThraceNG.
For the coating of fabrics, various strategies have been tested. Polypropylene PP is difficult to activate and melt with the plasma jet. The window between suitable plasticization and mechanical damage of the filament is small. Only with sufficient plasticization, enough material adheres to the filament. The P&S pursued two approaches to improve the deposition. Repetition and support with a swelling agent. The filaments were repeatedly (up to three times) coated and measured by the ITA. The filaments show an increased stiffness, presumably due to the temperature-induced changes in the polymeric structure of the filament.
Due to the limited deposition speed of the plasma based system alternative ways to fix the particles on the fabrics were investigated. With alternative energy sources we tested the necessary melting of the polymer of the fabric to fix the silica particles. The glue in this case is the polymer itself. Based on the adhesive effect of the swelling agent the use of a spray adhesive was tested.
ThraceNG was responsible for using the silica particles in hot melt lamination process in conjunction with hot melt glue in order to check their applicability in the process. These efforts were not successful primarily because of the structure of the fabric, which is a net. Lamination process requires that the used fabric has a dense, close structure, otherwise the hot melt glue is going to escape from the substrate. Exactly that was the reason of the inability to use a net in the lamination process. Experiments were realized manually with the aid of a brush, but again, there was no success due to the rapid solidification of the melt glue. Relative photos are provided below.

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The deliverable is available upon request

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