



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 [11]: *[Coated woven fabric]*

Version 1.0: first version delivered on 29/03/2019

*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).*

### Project Details:

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

**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:** [4 Textile prototyping]

**Task(s):** [4.1 & 4.2]: [Weaving of coated fibres for production of nets & Evaluation of coated woven nets]

**Deliverable Title:** [Coated woven fabric]

**Deliverable type:** Demonstrator, Confidential, only for members of the consortium (including the Commission Services)

**Lead beneficiary:** [Thrace NG]

**Involved Partners:** [Thrace NG]

**Deadline for delivery:** month [10], [29/3/2019]

**Date of delivery:** [26/3/2019]

Del [11]: [Coated woven fabric]



2

Co-financed by Greece and the European Union

## Table of Contents

---

1. Summary.....	3
-----------------	---

Del [11]: [Coated woven fabric]



UNIVERSITY OF THESSALY



Institut für Textiltechnik und Lehrstuhl für Textilmaschinenbau



## 1. Summary

---

In this deliverable the production of woven nets by coated fibers should be described. Initially, several trials performed in order to weave the coated fibers produced during Task 3.3, into a net. Unfortunately, these efforts didn't lead to the expected result for two main reasons: i) the weaving process in industrial scale is a severe process which harass the fibers. So, it was observed that during weaving the major quantity of silica particles was detached from fibers' surface due to abrasion in the weaving machine. ii) the silica particles detached from fibers' surface were dispersed in the air like aerosol, thus creating a very unhealthy working environment for the workers which couldn't be permitted. At that point it was realized that weaving of coated fibers couldn't be performed. These findings were communicated to all project participants and after discussion was decided to move on to the production (weaving) of the fabrics and their subsequent coating with the silica particles (which is actually D14).

Moving on, two types of uncoated yarns (multifilament and monofilament) were produced so as to be subsequently used for the construction of woven insect nets. After conducting weaving trials, only monofilament yarns were found to be suitable for the production of insect nets. Therefore, monofilament yarns were used for the production of three different types of woven nets. Specifically, 25, 40 and 50 mesh woven nets were produced in flat shuttle looms. The differences in the construction of the nets resulted in nets with different opening sizes and ventilation properties. The silica coated woven nets were produced with pilot plasma coating unit. In this process, the polymer is plasticized by a cold plasma jet. The silica particles are injected with a special distribution pump into the plasma jet and melted on the surface of the polymer. Therefore, no additional adhesive is needed, which could destroy the (nano)structure of the silica particles.

Del [11]: [Coated woven fabric]



Co-financed by Greece and the European Union

The deliverable is available upon request

Please send e-mail to the project coordinator: nkatsoul@uth.gr

Del [11]: [Coated woven fabric]

