Sächsisches Textilforschungsinstitut e.V.

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UV laser exposure

Objective

The focus of this research project was set on the targeted and digital dyeing of textile surfaces through exposure to UV laser radiation. For this purpose, a pre-treated textile was provided with a light-sensitive layer, which was previously applied manually and exposed on a small scale.

The aim of the project was to scale up this process in such a way that a continuous, repeat-free roll-to-semi-finished product process is created. In addition, the light-sensitive coating was to be further developed, particularly with regard to fixing the dye.

Approach and results

As part of the project, the exposure of textiles previously pre-treated with an emulsion of potassium hexacyanidoferrate(III) and ammonium iron(III) citrate was analysed.

This was carried out using UV laser radiation and a digital process for localised precise dyeing of textile surfaces.

A previously manual process of pre-treating the textile with a light-sensitive layer and exposing it to light was scaled up to such small dimensions that a repeat-free roll-to-half product process was created.

Textile pre-treated by means of UV laser radiation

A further aim was to optimise the light-sensitive coating of the textile, in particular to improve the fixation of the dye.

The shelf life of the emulsion-coated textiles was then analysed prior to the exposure process. The results showed that, under certain conditions, the textiles could be stored for a longer period of time before the next step in the process, exposure, was required.

In order to optimise the dyeing result, further tests were carried out with exposed samples. These included rinsing out the excess emulsion in water with the addition of vinegar, H_2O and distilled water as well as measures to fix the print.

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The final report on this project is available on request.

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