Sächsisches Textilforschungsinstitut e.V.

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WektroBio – Material dependence of electret charges in biopolymers

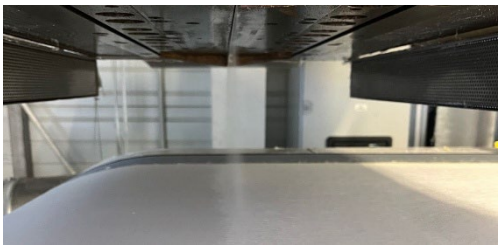
Objective

The completed research project aimed to address the increasing use of new biopolymers for electret charging filter applications in the meltblown nonwoven fabric. It was necessary to develop the lack of knowledge about the use of additives other than materials in meltblown nonwovens for electret stabilization as well as the functionality of newly produced additives bonded to biopolymers. The additives used to stabilize the electret charges have a direct influence on the filtering effect of the filter nonwoven fabric, which results in significantly worse filtering performance of small and micro particles. The solution approach thus contributes to the protection of the mask carrier, but at the same time also enables more effective product use of a wide variety of filter nonwovens for technical applications.

Approach and results

Project results demonstrate a feasibility of electret stabilisation of the biopolymer nonwovens with newly developed additive. The nonwoven fabric thus produced shows a uniform white color, without any discoloration or optical inhomogeneities. This was because the additive had fully integrated into the PLA matrix due to the material-like base. There was no phase separation as typically observed in PLA/PP mixtures. As a result, the melting process remains stable, and fiber formation also occurred in a controlled and uniform manner. The developed meltblown layers show good feel, uniform electret properties and air permeability without defects in the nonwoven fabric. Even at different temperatures and hole throughputs, no errors in the meltblown could be detected, which indicates a constant processing property.

Production of a meltblown layer at the STFI



Spray characteristics of the newly developed additive

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The final report on this project is available on request.

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