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SAMT – An automatable, reproducible, and eco-friendly manufacturing process for embroidered membranes used in Air Motion Transformers

Problem / Motivation

- AMTs are typically used as tweeters in loudspeaker systems, operating in a frequency range of approximately 2 kHz to 25 kHz.
- The manufacturing of AMTs is very complex and largely based on manual, workshop-like processes.
- The core component of commercially available AMTs is a membrane made of thin Kapton® film.
- A complex laminating and etching process is required: thin, meandering aluminum conductor traces are applied.
- The Kapton® film is folded by hand into an accordion-like structure using special tools, which results in a significant error rate.

Solution

- Development of acoustically effective embroidery base materials for specialized folding and coating processes
- Development of patterns for embroidered magnetostatic loudspeaker membranes based on electrically conductive materials
- Textile technology development of planar textile structures with integrated functional areas for magnetostatic loudspeaker membranes
- Design of a process technology for forming and reshaping the planar textile structures
- Development of structural adaptations to enable sustainable and simplified recycling processes
- Development of recycling and reuse concepts for the membrane components

Project Launch

04/2025

INNO-KOM

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