

## Revolving creel – developing an active thread rocker to feed rotating panels without crossing the yarn

### Objective

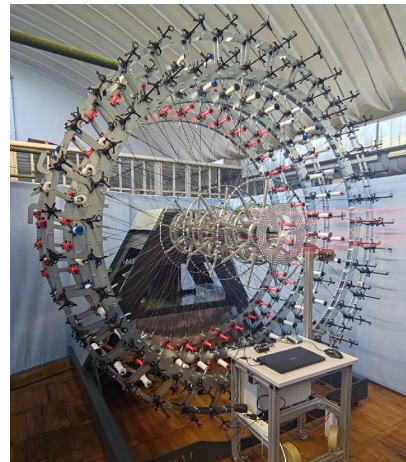
The Sächsisches Textilforschungsinstitut e.V. (STFI) uses a highly sophisticated diagonal laying technique for the production of multi-axial mats made from glass or carbon fibres. This allows the fibres to be processed in the correct mesh without puncturing or damaging them. However, current enquiries from industry show an increasing demand for the processing of special fibres, such as hollow filament membranes. These are much more sensitive than glass or carbon rovings and therefore require a more advanced processing. The diagonal laying technique practicable at STFI is in principle suitable for such applications, but the high thread tensions of the existing technology lead to problems in the non-destructive processing of hollow filaments.

The aim of the project was the optimisation and further development of the diagonal laying technique in order to be able to process even sensitive thread materials gently and without damaging them.

### Approach and results

The diagonal laying technique practicable at STFI is generally suitable for processing sensitive materials. In order to further minimise the stress on the yarn material from the creel to the knitting point, an actively driven thread tension rocker has been developed. This stepper motor-driven thread tension rocker imitates the compensating movement of a conventional thread rocker by evaluating a separate measuring thread movement and generating an optimised movement curve for the drive axes in order to dampen the thread vibrations. Furthermore, it should also rotate the diagonal threads with the help of a chain of tubes to prevent the threads from crisscrossing.

Another focus of the project was the development of a rotating, revolver-like creel that is specially designed to minimise thread take-up tensions.



Revolving creel with coils at STFI

This revolving creel has a capacity of 216 coils with a maximum coil weight of six kilograms. Special bobbin bearings and eyelets adapted to hollow filament material enable a maximum thread tension of less than one Newton despite radial bobbin unwinding. The creel consists of three segmented rings attached to a central shaft by textile spokes. These creel rings can be moved axially, which makes them easier to fit.

### Acknowledgement

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The final report on this project is available on request.

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