

# PROCESSING OF HIGH-MODULE FIBRES ON STITCH-BONDING MACHINES

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Authority responsible for the project:	BMW i - Gewiplan	
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## Initial situation

Industrial textiles containing high-module fibres are gaining importance both in textile industry and textile machine engineering. More and more fields of application are opened up and technologies developed. The number of usable fibrous materials is rising permanently.

## Research target

The research target was to find solutions for the optimal processing of these fibrous materials with due consideration of special properties within the technological process. Special attention was paid to the highly productive MALIMO stitch-bonding technique.

## Research result

The components investigated were the weft supply equipment including weft yarn creel, weft yarn brake, weft yarn clamping device and yarn guide elements at the weft thread carriage. The aim to ensure defined minimum radii by using wire bending elements was achieved for various thread guiding elements. In this way, a more gentle treatment of the thread was reached. In addition, the conditions for the coating of the thread guiding surfaces were improved. Various coating technologies were applied. Furthermore, two different types of weft thread separators for separating easily breaking carbon-, glass- and Aramid fibres were investigated. Importance was attached to a simple structure of these separators on the one hand and to a longer service life to be achieved by the use of hard metal on the other hand.

Design possibilities for a fabric take-down device for the processing of non-elastic foundation textures with gentle treatment of both fabric and needles as well as large stitches were investigated. Owing to its complexity, this subject could only be considered theoretically and should be treated in more detail within the framework of a more comprehensive investigation.

Wear on critical machine elements was investigated. At present, industrial tests are being carried out to confirm the improvements achieved in short-time tests.

The possibilities of the free programmability of the two driving axles by means of servomotors were utilized to prepare software solutions with the aid of which the load on the threads could be reduced. On the basis of a certain law of motion (sinusoidal curve with optimal-moment slope line) it is possible to reduce the maximum laying speed to 71 % of the present value.

A novel type of thread feed at weft-thread layer level was tested on a test stand. This solution enables operator-friendly feeding of the weft threads in a harmonic sequence of motions. Measurements of thread tension carried out under different feeding conditions and with different yarn brakes confirmed the positive influence of the conditions of motion on thread tension.

Another measure consisted in the presentation of various products made by using high-module fibres on MALIMO stitch-bonding machines. Attempts were made to interlace coated carbon and silicon fibres on a double-needle bed raschel machine. As a result it was found that the stitch-bonding elements in their present design as well the yarn feeding conditions are not suitable for processing products of satisfactory quality. Filament breakage occurred. This field requires further development.

The importance of a reduction in the waste of the usually very expensive fibrous materials was confirmed by profitability considerations.

## Application and economic advantages

A large portion of the findings gained in the course of the project were realized in series products of the partner in practice. These findings will also contribute to better chances of selling such products.

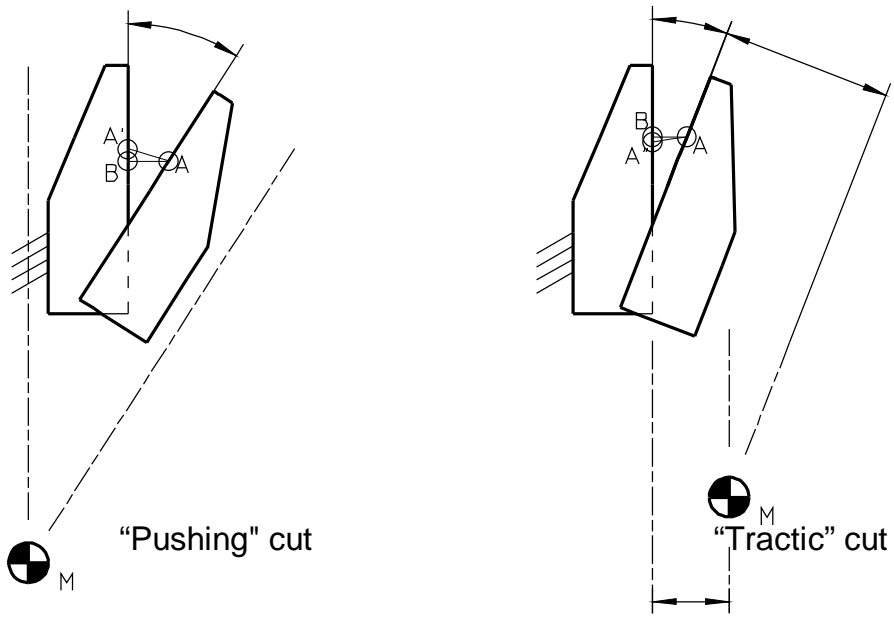


Fig. 1: "Pushing" and "tractive" cut

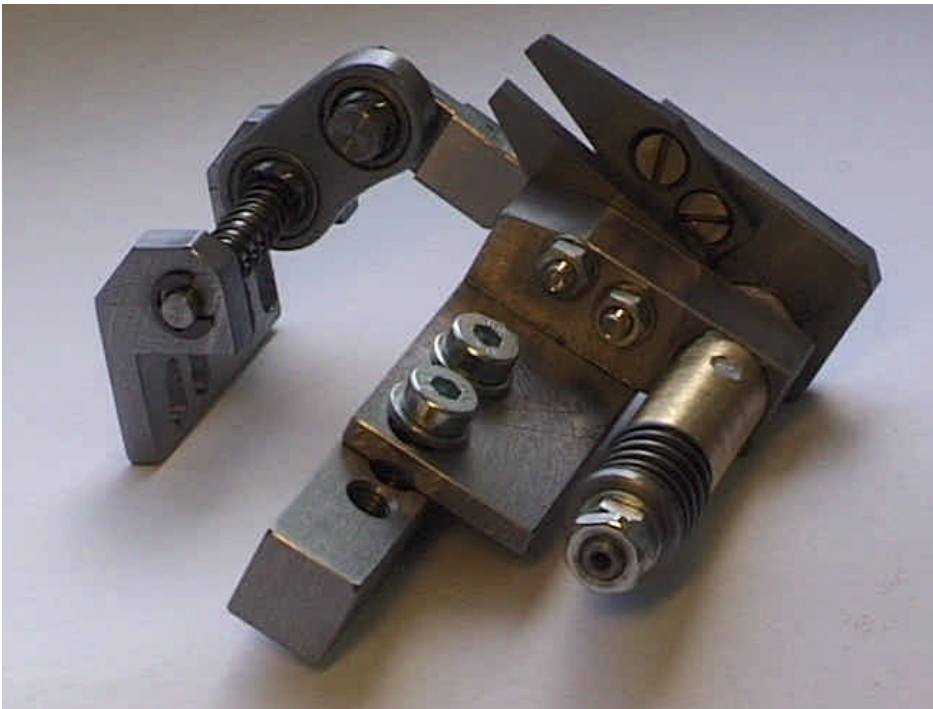


Fig. 2: Aramid cutter