

HYBRID WEFT-CATCHING SYSTEM FOR AIR-JET WEAVING MACHINES

Münkel A., **Gries T.**

Institut für Textiltechnik of RWTH Aachen University (ITA) Aachen, Aachen, Germany
ye-one.rhie@ita.rwth-aachen.de

ABSTRACT

With around 1,200 companies, the German textile and clothing industry is one of the largest branches of industry in Germany. One of the main characteristics of this branch of industry is the high number of small and medium-sized enterprises (75%). In 2014, German weaving mills alone achieved a turnover of € 1,577 million. There are 61 weaving companies in Germany with a total of approx. 8,600 employees. About 60 % of the companies (in about 40 companies) are located in the field of technical textiles, which produce high-quality goods.

A large part of the technical fabrics is produced using the air-weaving process, which is currently the most productive weaving process. The motivation for the development results from a problem on the part of the economy. During weft insertion, the stretch nozzle on air-jet weaving machines does not reliably capture and stretch the weft thread. This misconduct leads to mistakes. 60 - 80 % of machine downtimes during the processing of staple fibres and up to 90 % for filaments are due to weft faults. It is also possible that weft faults can only be detected after coating. In order to eliminate such weft faults, a longer blowing time, which is not necessary for the process, is currently being accepted. In addition, the length of the selvage is increased so that the thread can be reliably gripped.

In order to avoid errors, a new type of catching system is being developed in the project which reliably tightens the weft yarn and does not require any additional stabilization. A hybrid catch and draw system for weft yarns is planned, consisting of a pneumatic and a mechanical component adapted to the fluid flow. As soon as the pneumatic component has caught the yarn and positioned it in the reed channel, the mechanical component is activated. The mechanical component holds the yarn securely and thus prevents backward movements of the yarn. By securely holding the yarn, the relay nozzles can be deactivated at an early stage, thus counteracting the high energy consumption of air-jet weaving machines.