

Project titel: Dissolving on Demand
Partner: MJR PharmJet, Opti-Polymers
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Mission Statement:

Many industrially produced textile goods consist of different, firmly bonded materials. Products made of different materials combine the positive properties of the individual materials. Many disadvantages of the individual materials are compensated. At present, however, very few of these materials are recycled. The reason for this is that the composites cannot be separated technologically or that separation is not economical enough to return the pure components to the recycling process. Within the framework of a project funded by the Federal Ministry of Education and Research (BMBF), a research consortium has set itself the goal of reducing the quantities of non-recyclable mixed textile waste. Only in form of polyester-cotton blends, 15 million tonnes of waste are generated worldwide each year. At least a larger proportion of this mixed waste could be made available to the recycling industry when the new separation technology is successfully developed.

The basis for separating the composites is a new microcapsule system. The microcapsules are located in the area of the joint or in a sewing yarn. The polar capsules are activated by targeted microwave radiation at the recycler and thus destroy the multi-material textile joint.

Approach:

Within the project, the capsules are incorporated into a polyester sewing yarn with which the textiles from different materials are sewn together. First, suitable microcapsule systems will be produced by MJR PharmJet GmbH, Überherrn, with the patented MJR technology using a countercurrent process. The gentle incorporation of the

capsule systems into a synthetic masterbatch is carried out by Opti-Polymers GmbH from Rudolstadt. Optri-Polymers GmbH has expertise in the incorporation of shear- and temperature-sensitive additives. Subsequently, at the Institut für Textiltechnik of RWTH Aachen University (ITA), which is also the project coordinator, highly stretched multifilaments are spun in the melt spinning process. These filaments are the basis for the sewing thread. The development of the dissolvable sewing yarn is carried out iteratively and in close consultation between the project partners from laboratory scale to pilot scale to semi-industrial scale.

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