



# TextileMission – An Initiative against Microplastics from Textiles

## Plastics in the Environment – Sources · Sinks · Solutions

Textiles made of synthetic fibers such as polyester can lose tiny particles during production and washing, which enter rivers, lakes and seas via wastewater and might accumulate in the food chain. Fleece materials used for functional clothing are of particular concern. Synthetic fiber particles with a diameter of less than 5 millimetres are only partially filtered out by modern wastewater treatment plants. The partners of the joint research project TextileMission have taken on the task of reducing this environmental impact.

### Improving Processes and Wastewater Treatment

Current studies assume that 250,000 microplastic particles are washed out of a garment during laundry. For 100,000 fleece jackets, this corresponds to the amount of 11,900 plastic bags per year. The project partners of TextileMission are taking a multidisciplinary approach to this important entry point of microplastics into the environment: On the one hand, through research into textiles and improved production processes, they intend to develop fleece materials that release significantly fewer microplastic fibers than today. The textile research partners and the sportswear manufacturers involved are also testing bioplastics as an environmentally friendly alternative. On the other hand, the project participants are investigating the fate of microplastic fibers in the environment. To this end, they are examining material flows and developing wastewater treatment technologies for more effective removal of microplastics from wastewater. Such processes could also help to reduce the input of microparticles from non-textile sources.



Textiles made of synthetic fibers, such as polyester, emit microplastic particles during household washing: This applies to fleece fabrics in particular.

### Determining the Status Quo

First, the researchers systematically collect data in laundry washing tests to determine the volumes of microplastic particles washed out of various textiles. In addition, textiles available on the market and fleece garments newly developed by the project partners – including textiles made of bioplastics – are separated into different washes according to composition and colour. These are then laundered several times with equal temperature, duration and revolutions. Researchers collect the emitted microplastic particles in special filters and determine their number and size. The laundry washing tests are intended to identify materials, processing and finishing methods that release as little microplastic particles as possible. The technical factors of household laundry should be optimized in such a way that significantly fewer microplastic is released from the fabrics.

In order to learn more about the material flows, the research partners are following the course of microparticles released into the environment; their retention and persistence is investigated at different purification stages of a laboratory wastewater treatment plant. This provides important information for enhancing wastewater treatment processes. The research partners then determine the short- and long-term effects of non-retaining synthetic and biopolymer fibers on aquatic organisms. In addition, they are testing the biological degradation of fleece made of bioplastics under various (environmental) conditions. These findings are incorporated into the development of new materials.

## Strengthen Germany as a Production Location

The results of the joint research project TextileMission could contribute to strengthening Germany as a location for the development and manufacture of environmentally friendly products in various sectors: sports goods industry, household appliances and washing detergents as well as water technology. Furthermore, operators of wastewater treatment plants receive detailed knowledge about the retention of synthetic and biopolymer fibers in their facilities and thus indications for the further development of treatment technologies.



Washing tests are carried out to measure the extent of textile microplastic emissions. The picture shows the filter system and washing machines at the Niederrhein University of Applied Sciences.

### Research Focus

Plastics in the Environment – Sources • Sinks • Solutions

### Project Title

Microplastics of Textile Origin – A Holistic Approach: Optimised Processes and Materials, Material Flows and Environmental Behaviour (TextileMission)

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