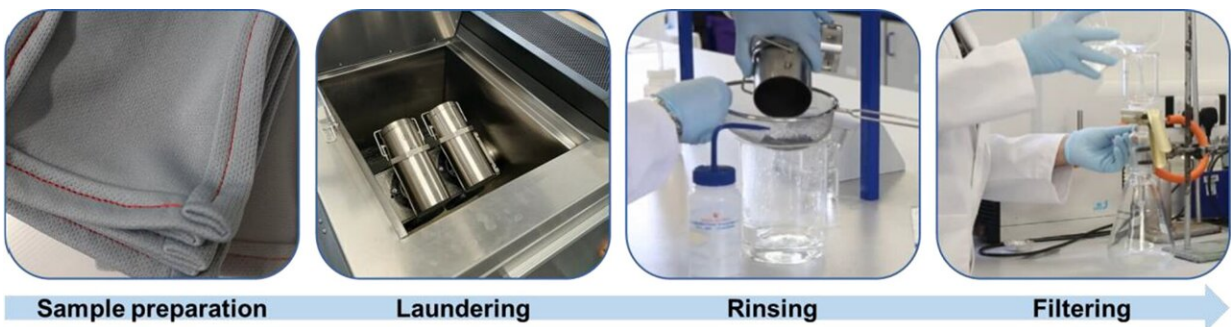


How much microfiber do we emit with our washing? The equivalent of up to 1,500 double-decker buses every year

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Laundering test method procedure. Credit: *Environmental Science and Pollution Research* (2023). DOI: 10.1007/s11356-023-25246-8

The U.K.'s laundry releases microfibers weighing the equivalent of up to 1,500 double-decker buses every year, according to new research.

The discovery was made by academics in Leeds' School of Design, who co-created a test to measure how different materials and washing conditions affect the amount of microfibers released into water.

Microfibers are tiny threads that enter the environment when garments are made, worn and washed. Although they are smaller than 5mm and invisible to the [naked eye](#), microfibers have a substantial impact as a

major source of water pollution.

The researchers estimated that annual microfiber release from the U.K.'s washing was between 6,860 and 17,847 tons. That's the equivalent of around 600 to 1,500 double-decker buses.

Postgraduate researcher and lead author Alice Hazlehurst said, "Quantifying microfiber release is an important step in understanding the scale of the problem, as well as the potential impacts of this form of pollution. There are already lots of estimates out there, but these vary dramatically and it's almost impossible to make meaningful comparisons.

"We used a reliable testing method to compare microfiber release from different fabrics and under different washing conditions in the lab. Based on our results we were able to estimate the quantity of microfiber release at a realistic scale."

Based on their estimate, the researchers argue that microfiber release is a relatively small problem in comparison to the fashion industry's waste problem, with 365,000 tons of clothing going to landfill every year from the U.K.

Laundry in the lab

In a collaborative project involving the University, EOG and a large network of stakeholders, TMC co-created and released a globally aligned, standard test to determine the level of microfibers shed from [fabric](#) during domestic laundering.

The TMC Test Method has already been adopted by EU and U.S. standard bodies due to its reliability. This will help clothing brands more accurately test their garments for microfiber release, inform washing machine manufacturers about filtering and give a clearer picture of the

scale of the problem.

To create a more reliable estimate of U.K. microfiber release, researchers used a Gyrowash—a device that replicates a domestic washing machine in lab conditions. They tested 16 common fabrics, including polyester, cotton, viscose and blended materials, and compared different yarn types and constructions (knitted or woven fabrics). They also measured the effects of washing conditions, including the size of the load and how much the machine shakes the clothes.

How do wash settings affect microfiber release?

More than twice as much microfiber material was released when the ratio of water to clothing was doubled. Filling up the washing machine drum with more clothes can reduce the amount of microfibers lost because less water moves through the clothes and dislodges loose material. However, overfilling a washing machine can be a safety concern, as well as potentially reducing the quality of the wash.

Agitation—the term for how much a washing machine shakes clothes around—also had a big impact, with higher agitations increasing microfiber loss significantly.

Microfiber loss reduced substantially after a brand-new fabric's first wash, but this effect leveled out after three washes. Other estimates have been based on the results of new fabrics being washed, so the findings suggested that less microfiber is being released than previously thought.

The testing showed that the fabric characteristics—yarn type, construction (knitted or woven), fiber type (eg polyester or cotton)—had more influence than washing conditions on how many microfibers were released. The worst offender for microfiber release was a chenille polyester fabric, whereas some fabrics that had been brushed or peached

lost less material.

Dr. Mark Sumner, Lecturer in the School of Design, said, "Ultimately, the research shows that fabric choice is complex and we shouldn't assume some fabrics are worse than others."

Dr. Kelly Sheridan, research director at TMC, said, "The microfiber Consortium has actively driven for a globally aligned test method that can be used by the textile industry to measure fiber fragmentation from finished fabrics.

"The TMC Test Method was the foundation for the development of an international ISO standard, which is testament to its accuracy and reliability. Consequently, microfiber loss data generated from this method can supersede that of previous quantification estimates that have used inconsistent test methodologies."

More information: Alice Hazlehurst et al, Quantification of microfibre release from textiles during domestic laundering, *Environmental Science and Pollution Research* (2023). [DOI: 10.1007/s11356-023-25246-8](https://doi.org/10.1007/s11356-023-25246-8)

Provided by University of Leeds

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