



Microfibre Shedding – Topic FAQ

1. What are microfibres?

The term ‘microfibre’ is currently used to describe fibres that are shed from clothing during production, consumer use, or end of life, and end up as pollution in the environment.

Microfibres can originate from all textiles and therefore can be comprised of both synthetic (plastic) and natural (cellulose/protein) materials.

However, synthetic microfibres are also a subset of microplastics (plastic particles less than 5mm in size) which can originate from many sources and so much of the conversation around microfibres assumes them to only be plastic in nature.

While there is no standard threshold for the size of microfibres, they are often defined as any fibres less than 5 mm.

It is important to avoid confusion around the term “microfibre,” which has historically been used to describe synthetic fibres finer than one denier or decitex/thread, having a diameter of less than ten micrometres, and a type of fabric made from these fibres, commonly used as cleaning cloths, but also seen in other applications.

2. What are the sources of microfibres?

All textile products and apparel shed microfibres (not just outdoor apparel):

- Fashion apparel
- Sport/outdoor apparel
- Industrial textiles, such as carpets
- Home textiles, such as bedding, furniture, window treatments, towels
- Automotive textiles
- Geotextiles
- Personal care products

Shedding can occur during, and be influenced by, all phases of the product life cycle, including the manufacturing process of products as well as in the consumer use, care, and disposal phases. This infographic be used to demonstrate the multiple factors that can affect shedding <http://bit.ly/TMCInfographic> .

Several of the main sources of microfibre shedding include:

- Transport via the water during washing – when the fabric is washed during the manufacturing process as well as when the consumer is washing the product.
- Transport via the air, again during the manufacturing process (such as when the fabric is cut into a garment pattern) as well as from abrasion during consumer use of the product.
- Shedding from textiles as they break down in landfills after consumer disposal.

3. Isn't this just an issue with synthetic fabrics and fibres, like polyester fleece?

No. ALL fabrics and fibres shed, whether natural or synthetic.

- Synthetic fibre shedding occurs not only with polyester, but also with nylon, acrylic, etc.
- Natural fibre shedding occurs as well – with fabrics like cotton, rayon, viscose, and wool.
- Blended fabrics are extremely commonplace (i.e. cotton/polyester blends.)
- In addition to the fibre itself, fabrics of any type, natural or synthetic, often include chemical coatings and finishes, which are then transported with the microfibres when they shed where they can also cause problems in the environment.

4. What is the problem with microfibres?

The concern with microfibres is around their potential impacts to human health, to marine life, and to the environment. Research does not yet exist to confirm these potential impacts, though a number of projects are currently in progress that will hopefully provide this crucial data.

5. Can biosynthetics/biodegradable/compostable fibres be seen as a potential solution to the microfibre issue?

- Both biodegradation and compostability depend on very specific environmental conditions in terms of temperature and moisture profiles, which may not be found in all environmental locations that microfibres end up. As such, while a fibre may be regarded as 'biodegradable' or 'compostable' this might not occur easily in certain environmental locations eg deep sea, extreme cold etc.
- Biosynthetics are fibres and fabrics made (either wholly or partly) from renewable resources such as corn, sugar cane, algae, and fungi. Although biosynthetics are from naturally occurring materials, not all biosynthetics are biodegradable. The biodegradability is based on the mechanical processing, material blend, and the fabrication dyeing and finishing. (Source: Textile Exchange)
- All materials, whether textiles or hardgoods, will degrade during their lifecycles. Biodegradable materials will break down or decompose through microbial action into basic elements found in nature, in a relatively quick time frame. Compostable materials

will break down quickly in a typical composting operation restoring nutrient-rich, soil-conditioning matter back into the environment.

- During any biodegradation or composting process, textile chemicals will be released into the environment, these can include, but are not limited to pigments and dyes (which may be synthetic), or coatings and finishes.

6. What is the key research currently being done?

Many research projects and initiatives are underway to address the key data gaps. For example:

- Outdoor brand Patagonia partnered with University of California Santa-Barbara in 2015 to conduct some of the first research specifically on microfibre shedding
- The Microfibre Consortium (TMC) facilitates the development of practical solutions for the textile industry to minimise microfibre release to the environment from textile manufacturing and product life cycle. To date, the work carried out by TMC has included the development of a standardised test method, and research concerning the shedding behaviours various production parameters <https://www.microfibreconsortium.com/>
- A number of European industry associations have formed a Cross Industry Agreement (CIA) to, amongst other points, contribute to the development of international standardised test methods to identify and quantify microfibres present in water and the environment, which has brought together the work of TMC and AATCC. <https://www.euratex.eu/cia/>
- Outdoor brands MEC, REI, Patagonia, and Arc'Teryx are currently partnering with Vancouver Aquarium on a research study to better understand where microfibres come from and how to track them in the environment. <https://research.ocean.org/program/plastics-lab#plastics-lab>
- A standardised test method for microfibre shedding is also being developed through the U.S.-based American Association of Textile Chemists and Colorists (AATCC), and being globally aligned through the work of the TMC and CIA.

Note: this is intended as an example of a few initiatives and not a complete list of all projects in progress, please contact responsibility@europeanoutdoorgroup.com for more information on other projects

7. What do we know contributes to increased microfibre shedding?

- Age of garment: in a study, jackets shed 60% more fibres after undergoing an ageing treatment. (http://www.esm.ucsb.edu/research/2016Group_Projects/documents/PataPlastFinalReport.pdf)
- Type of washing machine: in a study, jackets washed in top-load washing machines shed 170% more fibre mass than jackets washed in front-load washing machines. (http://www.esm.ucsb.edu/research/2016Group_Projects/documents/PataPlastFinalReport.pdf)

- While more research is needed to make definitive conclusions, other factors could include fibre type, fabric construction, finishing process (wet vs. dry), washing method, and detergent used.

8. Why does the industry continue to use fabrics that are thought to shed microplastic fibres?

All textile materials shed over time, whether natural or synthetic. The industry is currently researching the shedding rates of various textile types via various projects; however, at this point, it is unclear which fibres have the highest release rate or overall impact.

All materials have impacts. Natural fabrics and fibres are not without their challenges as well, some of which include:

- Cotton is one of the largest crop users of water globally – a serious issue in places where water scarcity is a daily challenge. Conventionally grown cotton (that is not grown under a responsibility program such as certified organic or Better Cotton Initiative) is also a heavy user of pesticides and insecticides.
- Rayon and viscose come from wood pulp, which can be linked to deforestation (unless grown under a responsibility program such as Canopy.)
- Traditional rayon/viscose and bamboo fabrics are often produced through a highly intensive chemical process.
- Animal-based fabrics such as wool, down, and leather bring their own challenges that must be managed properly, including animal welfare guidelines; grazing practices; and chemical treatments.

Every fabric in the marketplace today has benefits and disadvantages, in terms of performance as well as impacts. The outdoor industry will continue to utilise a range of both natural and synthetic fabrics for a wide variety of applications.

Synthetic fabrics can provide unparalleled performance in specific applications, including outerwear, activewear, packs and bags, and camping tents. Polyester and nylon, most common to the outdoor industry, are ideal for sports and activities where function and performance matter, particularly in cases where extreme weather conditions also play a factor.

Polyester is considered an ideal material for technical outdoor apparel and gear because it is lightweight yet warm, fast drying, and resistant to mildew, stretching, and shrinking. Nylon is very strong, resilient, abrasion resistant, and can have a cooling effect next to the skin. Both are able to absorb a high amount of sweat and are easy to care for.

9. What is the outdoor industry and its brands doing to address this issue, and what are the next steps?

- Leading the development of standardised test methods to measure shed rates of fabrics and fibres in a consistent way.
- Research and innovation around new fabric development (this will be accelerated once the standardised test methods for shed rates are in place.)
- Collaborating with academic and research institutions, as well as with their industry peers, to drive needed scientific studies and impact research that will allow them to make informed decisions about fabric/fibre choices.
- Policy engagement, educating legislators about the issue from an industry perspective.
- Developing shared communications tools to promote accurate, consistent information.
- Driving and cataloguing good practice efforts already happening in the supply chain, including microfibre recovery practices at apparel manufacturing facilities as well as fabric cutting methods for reduction of microfibre shedding.
- Continuing to drive general good practices, including ensuring product durability and gathering life cycle analysis data.
- Collaborating with other brands in the industry – often competitors - to address this issue via the key outdoor industry trade associations: the Outdoor Industry Association Sustainability Working Group in North America, and the European Outdoor Group in Europe and the U.K.

10. What do we know now about the choices consumers can make to help reduce the impacts of microfibre shedding?

Until standardised test methods are in place, there is no way to determine which fabrics or fibres are “better” or “worse” in terms of shed rates. Until that time, consumers are encouraged to do the following:

- Wash your clothes and home textiles less.
- Wash clothing in cold water and use a lower spin cycle.
- Utilise front-load washing machines where possible.
- Line-dry instead of using a mechanical dryer.
- Invest in a microfibre catch product; some examples are listed below. Important note: these are NOT ultimate solutions, as the fibres caught go into your bin, then into the landfill and potentially into groundwater or the air from there. However, they are helpful tools to begin to understand the microfibres you and your household may be producing.
 - Guppy Friend
 - Cora Ball
 - Lint LuvR
 - Planet care filter

- Consider quality and traceability when purchasing a new garment or textile. What fabric was used, where did it come from, and how was it produced?