



Outdoor Industry Association Priority Issues Brief:
Microfibers
Updated March 2018

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1. Overview

Plastics of various sizes are being discovered in waterways and marine life, at levels and in places not previously realized. The presence of plastic debris poses dramatic changes and risk to the marine ecosystems; for example, small plastic particles and fibers can be ingested by aquatic life, not only harming the animals themselves, but passing the plastic through the food chain.

A relatively new and emerging sub-category of marine plastic study is microfibers – tiny fibers (both synthetic and natural materials) thought to be released into waterways when apparel products are washed by consumers. The outdoor industry is being looked to as a potential source of microfibers due in large part to the fleece garments that are made by many outdoor companies.

2. History

In June 2010, a workshop was held by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in Paris to discuss 'new and emerging issues' in relation to the state of the marine environment.

Research conducted in 2011 indicated that microfibers are prevalent contaminants at coastline sites on six continents, from the poles to the equator.¹

In 2014 and 2015, several news articles from prominent sources called attention to the issue of microfibers and the outdoor industry as a potential contributor, including The Guardian and Outside Magazine.

In December 2015, the Microbead-Free Waters Act of 2015 was passed into U.S. Federal law, banning rinse-off cosmetics that contain intentionally-added plastic microbeads beginning on January 1, 2018, and banning manufacturing of these cosmetics beginning on July 1, 2017.

¹ Browne, M. A., Crump, P., Niven, S. J., Teuten, E., Tonkin, A., Galloway, T. & Thompson, R. 2011 Accumulation of Microplastic on Shorelines Worldwide: Sources and Sinks. *Environmental Science & Technology* **45**, 9175-9179.

3. Key Facts and Context

Marine debris, including **ocean plastics**, is litter that ends up in oceans, seas, and other waterways.

Microplastics, a subset of ocean plastics, are small plastic particles that often can't be seen by the naked eye, with a size generally between less than 5 millimeters. Microplastics come from three principal sources:

- i) Direct release of small particles. For example, release of microbeads from personal care products, or plastics used for shot blasting.
- ii) Plastic fragments arising from the structural deterioration and disintegration of plastic objects, mainly litter, which can include: packaging, household items such as toothbrushes and razors, building materials, lost or discarded fishing and aquaculture gear, and other items. Such disintegration occurs in the environment.
- iii) Small particles that are released from apparel and textiles during their use.

Microfibers (also called microplastic fibers) are a subset of microplastics – they are typically fractions of a millimeter in diameter and are less than 5 millimeters long. A source of microfibers is suspected to be textile based products - articles of clothing and household textiles, particularly those that require regular laundering. Present data suggests that microfibers can readily enter waterways when textiles are washed, as both home laundering machines as well as existing municipal wastewater treatment systems currently have limitations in filtering out this very small size of particle.

ALL fabrics and fibers shed, whether natural or synthetic:

- Synthetic fiber shedding occurs not only with polyester, but also with nylon, acrylic, etc.
- Natural fiber shedding occurs as well - fabrics like cotton, rayon, viscose, and wool
- Blended fabrics are commonplace (i.e. cotton/polyester blends)
- Fabrics of any type often include chemical coatings and finishes, which are then transported into oceans and waterways via the microfibers

MANY types of products are shedding, in both the manufacturing process as well as in the consumer use/cleaning/disposal stages - not just outdoor fleece garments:

- Fashion apparel
- Sport/outdoor apparel
- Industrial textiles, i.e. carpets
- Home textiles, i.e. bedding, furniture, window treatments, towels
- Tires

Fiber shedding from textiles may occur through all stages of the production process (spinning, fabric making, dyeing, and tier 1 garment making), as well as at the consumer use/wash phase. Shed rates can be affected by a number of factors, including but not limited to:

- Fabric cutting method (machine vs. hand cutting)
- Age of garment being washed
- Type of washing method (front-load vs. top-load washing machine vs. hand washing)

4. What OIA and its members are doing

Data clearly shows that microfibers exist as a source of contamination in waterways and marine life. However, there is a significant lack of data currently to indicate the exact sources and

mechanisms of microfiber pollution. The outdoor industry needs this data in order to have a clear understanding of the role it might play, to drive thoughtful investments and partnerships to most effectively and efficiently address the issue; to pull the most impactful levers; and understand where this sits in the broader landscape of supply chain priorities that need resources and support from the industry.

Open questions for the industry, which we are actively seeking to address, include (but are not limited to):

- Is there a difference in shedding rates among garments and fabrics?
 - What are the standardized test protocols that should be used?
- Is there a difference in shedding rates based on the material type or material construction used within a garment?
 - What are the standardized test protocols that should be used?
- What is the potential contribution of the broader apparel industry - beyond the outdoor sector - to this issue?
- What is the potential contribution of the industrial textile sector to this issue?
- What is the potential contribution of the tire and automotive industry to this issue?
- What is the potential contribution of the appliance/washing machine industry to this issue?
 - What are the relative effects of appliance constructions and laundry cycles?
 - Is the appliance industry looking into potential solutions on their end?
- What is the potential role of municipal water treatment facilities in this issue?
 - Is there a realistic technical and economic potential to remove fibers in wastewater treatment plants globally, and what would be the collateral effects?

Since 2007, the OIA Sustainability Working Group has worked proactively and collaboratively to implement best practices in the supply chain. The topic of Microfibers and Ocean Plastics is addressed via the Microfibers Task Force, an initiative created in 2015 within the OIA Sustainability Working Group. The Microfibers Task Force is committed to building outdoor industry knowledge and understanding of the issue and supporting creation and adoption of best practices.

Vision of Success for the OIA Sustainability Working Group Microfibers Task Force:

- Gain a clear, data-driven understanding of the sources of microfiber shedding, including the outdoor industry's contribution as well as the contribution of other industries and sectors; and,
- Using that data, make informed decisions, as quickly as possible, about the industry's most efficient and effective next steps, resources, and partnerships toward reduction or elimination of microfiber shedding.

In October 2017, OIA in partnership with Ocean Conservancy, the University of California Santa Barbara Bren School of Environmental Science & Management, and the consultancy Future 500 co-organized the first cross-sector Microfiber Leadership Summit. Attendees included participants from outdoor apparel, fashion apparel, home appliances/ white goods, chemicals manufacturers, academia and researchers, wastewater treatment plants, textile standards bodies, industry associations, consumer solution providers, and government representatives.

We emerged from this summit with a clear roadmap of next steps for all industries and sectors to follow. The intent is for all industries, initiatives, and researchers globally to use this map as a common reference point to ensure coordination of efforts and eliminate duplication wherever possible:

Global Action Roadmap on Microfiber Pollution – High-Level Next Steps

October 2017

Research/Academic Community:

1. Conduct a “Material Flow Analysis” – identify sources, emissions, and transport of microfibers across the system
2. Conduct a risk assessment – identify actual impacts of microfibers (both the particles themselves as well as the chemicals/coatings that may be transported by the particles) on the environment, human health, and marine life

Industry Community (outdoor apparel, fashion apparel, carpets/industrial textiles, home appliances, wastewater treatment plants):

1. Develop the necessary test methodologies - allow assessment of shed rates of textiles and finished garments in a consistent manner, to ultimately identify the “worst offenders” and drive innovation
 - a. “Wet” test method, looking at washing techniques and their potential impacts – via AATCC – happening now, draft method should be available for piloting in November 2017
 - b. “Dry” test method, looking at potential abrasion-related impacts – via ASTM (using existing Martindale Test as a stop-gap test) – starting work now, draft method should be available for piloting in about 1 year
 - c. Potential test method for shedding from dryers – TBD – would likely be developed through AATCC / laundering process
2. In the meantime – work to identify best practices at the manufacturing, use, and disposal stages
 - a. Engage in shared supplier projects to gather data on shed rates/leakage points at various stages of production (spinning, fabric making, dyeing, tier 1 garment making)
3. External communication about industry workplans and next steps – why standardized test methods are important, what consumers can do now, etc.

Global Cross-Industry Microfiber Shedding Workplan – download the graphic here:

<https://outdoorindustry.box.com/s/uv0ysihhuzxoxs11h2tcfcd61b1cf1u>

OIA and its members are committed to pursuing these objectives in partnership with the diverse group of stakeholders who share our desire to adopt global environmental and social best practices to benefit the operations and communities in which we conduct our business.

5. Key Resources:

Global Cross-Industry Microfiber Shedding Workplan – October 2017

<https://outdoorindustry.box.com/s/uv0ysihhuzxoxs11h2tcfcd61b1cf1u>

Microfiber Shedding System Map (credit: Joel Mertens, MEC)

<https://outdoorindustry.box.com/s/iit93mea4qyp0eexqjrgjciw62y47i2>

Microfiber Shedding Research Gap Analysis

<https://outdoorindustry.box.com/s/lwi08x950knhplitor10rlnjpv8lorik>

OIA Microfiber Pollution Resource Library

<https://outdoorindustry.box.com/s/lj5mim3ln5oh19k39hkxp9km2j8ksg5p>

OIA Blog Posts:

Microplastics, Microfibers, Pollution, and... the Outdoor Industry – July 2, 2015

<https://outdoorindustry.org/article/microplastics-microfibers-pollution-and-the-outdoor-industry/#articles,supply-chain,sustainability>

Microfibers and the Outdoor Industry: Issue Update – February 1, 2017

<https://outdoorindustry.org/article/microfibers-and-the-outdoor-industry-issue-update/#articles,sustainability>

6. Contacts:

For issue-related inquiries, please contact:

Beth Jensen
Senior Director of Sustainable Business Innovation
Outdoor Industry Association
bjensen@outdoorindustry.org

For policy-related inquiries, please contact:

Andrew Pappas
Policy Manager
Outdoor Industry Association
apappas@outdoorindustry.org