

September 22, 2023

Thông Quách
Grade 10 Student
Aden Bowman Collegiate Institute
Saskatoon, Saskatchewan, Canada
0403677@spsd.sk.ca and thongq@outlook.com



RE: Policy Brief: Washing Machine Filters Reduce Microfiber Emissions to Ecosystems

Dear the House of Commons in Parliament assembled,

My name is Thông Quách and I am a youth scientist in grade 10 currently attending school at Aden Bowman Collegiate in Saskatoon, Saskatchewan, Canada. I was recently accepted as an ambassador for The 5 Gyres Institute. Our mission is empowering action against the global health crisis of plastic pollution through science, education, and advocacy. The 5 Gyres Institute is a 501(c)(3) nonprofit organization in special consultative status with the United Nations Economic and Social Council since 2017.

Microfibers are known to shed from textiles, including clothing. Clothes laundering is a major source of microfibers to the environment and washing machine filters are a known solution to the issue.

I am writing this letter to call upon all Members of Parliament to:

- Create legislation requiring built-in washing machine filters that capture microfibers that could include a microfiber emission cap or a minimum filter pore size set at a level that is most effective for catching microfibers (e.g., 100 μm).
- Provide tax credit to consumers that retrofit machines with after-market filters.
- Enact legislation for laundry filters to be required in industrial textile facilities, as well as commercial, public, and institutional laundry facilities.
- Provide funding for further research on other sources of microfibers (e.g., dryers) to the environment and mitigation strategies.

Please see the full policy brief below from The 5 Gyres Institute for more details.

Dr. Lisa Erdle, the Director of Science and Innovation at The 5 Gyres Institute has verified that all the information provided in the policy brief is accurate to the extent of her knowledge. Please do not hesitate contact us if you would like to obtain more information or further discuss this policy brief. On behalf of everyone at The 5 Gyres Institute, we thank you for your work towards a healthier environment and cleaner ecosystems here in Canada.

Sincerely,

Thông Quách

Thông Quách (0403677@spsd.sk.ca and thongq@outlook.com)
Grade 10 Student, Aden Bowman Collegiate, Ambassador for The 5 Gyres Institute

Lisa Erdle

Doctor Lisa Erdle, PhD (lisa@5gyres.org)
Director of Science and Innovation at The 5 Gyres Institute

Policy Brief



Washing Machine Filters Reduce Microfiber Emissions to Ecosystems

Prepared by **Thông Quách**, Grade 10 Student, Saskatoon, SK, Canada

To the House of Commons of Canada in Parliament assembled

Updated from a 2021 brief by Lisa Erdle, Dorsa Nouri Parto, David Sweetnam, Sam Athey, and Chelsea Rochman

Background Information

Microfibers, anthropogenic fibers (<5mm), are the most prevalent type of microplastic and other anthropogenic particle in the environment. Plastic, cotton, and other microfibers from textiles contaminate surface water¹, deep sea², freshwater and marine sediment³, wildlife⁴(including seafood⁵⁻⁶), and drinking water⁷. Laboratory studies show microfibers- including plastic (e.g., nylon and polyester) and natural (e.g., cotton and rayon) - can cause negative effects to animals⁸⁻¹⁰, and often contain harmful chemicals¹¹, some of which are known toxics¹².

Microfibers are known to shed from textiles, including clothing. Clothes laundering is a major source of microfibers to the environment and washing machine filters are a known solution to the issue.

Many studies show that hundreds of thousands (up to 18 million) microfibers are released during every wash cycle¹³⁻¹⁵. Once released, microfibers travel via wastewater to wastewater treatment plants, where microfibers can enter into the environment. An estimated 4.8 million tonnes of synthetic microfibers have entered water bodies and terrestrial environments since 1950¹⁶. Washing machine filters have been studied as a potential mitigation strategy¹⁷⁻¹⁸. Experiments show that washing machine filters are effective at capturing microfibers in laboratory experiments¹⁸ and in field studies¹⁹.

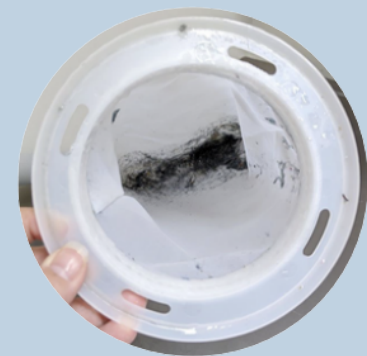
Other sources of microfibers include clothes dryers, carpets, upholstery, cigarette butts, and other woven materials (e.g., disposable masks, wet wipes, sanitary products). Currently, the relative contribution from these sources is unknown.

Highlights

Research shows that washing machine filters capture up to 89% of microfibers¹⁸.

Filters installed in washing machines leads to a significant reduction in microfibers at wastewater treatment plants²⁰.

Widespread deployment of washing machine filters into homes is an effective solution to prevent microfiber emissions.



Microfibers shed from washing machines captured in a 100 µm filter

Policy Recommendations

Legislation requiring built-in washing machine filters that capture microfibers that could include a microfiber emission cap or a minimum filter pore size set at a level that is most effective for catching microfibers (e.g., 100 µm).

Providing tax credit to consumers that retrofit machines with after-market filters. Legislation requiring laundry filters to be required in industrial textile facilities, as well as commercial, public, and institutional laundry facilities.

Provide funding for further research on other sources of microfibers (e.g., dryers) to the environment and mitigation strategies.

Current Progress

France passed 2020-105-Article 79 to require built-in washing machine filters by 2025.

Several jurisdictions have introduced filter bills (e.g., California AB 622, Ontario Bill 279, and US BreakFreeFromPlastic Bill). Connecticut Passed HB 5360 (Public Act 18-181) and established a working group to address synthetic microfiber pollution.

Microfiber shedding test method AATCC TM212-2021, for the textile industry to test microfiber shedding in laundering

US passed the Save Our Seas Act 2.0 establishing the first federal microfiber definition and the creation of standardized monitoring.

A single load of laundry can release 18 million microfibers, which contaminate our:



Oceans, rivers and other aquatic ecosystems



Land, farm fields and agriculture

Summary

Whereas, microfibers are ubiquitous pollution in the environment, and Whereas, there is scientific evidence suggesting microfibers cause harm, and

Whereas, to date, the largest documented source of environmental microfibers is washing machines, and

Whereas, findings indicate washing machine filters divert the majority of microfibers released during laundering and significantly reduce loadings to the environment, therefore,

Scientific evidence supports policy that implement filters, thereby reducing microfiber emissions to the environment.

(1) Kashiwabara, L. M. et al. Marine Pollution Bulletin 2021, 165, 112148. (2) Hamilton, B. et al. Mar. Ecol. Prog. Ser. 2021, 675, 23–33. (3) Ebrahim, A. et al. AJUR 2022, 19 (3), 27–35. (4) Michishita, S. et al. Environmental Pollution 2023, 316, 120548. (5) Baechler, B. R. et al. Limnology and Oceanography Letters 2020, 5 (1), 54–65. (6) Rochman, C. M. et al. Scientific Reports 2015, 5 (August), 1–10. (7) Danopoulos, E. et al. PLoS ONE 2020, 15 (7 July), 1–23. (8) Au, S. et al. Environmental Toxicology and Chemistry 2015, 34 (11), 2564–2572. (9) Watts, A. J. R. et al. Environmental Science and Technology 2015, 49 (24), 14597–14604. (10) Mateos-Cárdenas, A. et al. Science of the Total Environment 2021, 753. (11) Lacasse, K.; Baumann, W. Textile Chemicals; Springer-Verlag: Berlin/Heidelberg, 2004. (12) Schellenberger, S. et al. Environmental Science and Technology 2019, 53 (24), 14329–14339. (13) De Falco, F. et al. Environmental Science and Technology 2020, 54 (6), 3288–3296. (14) Galvão, A. et al. Environ Sci Pollut Res 2020, 27 (21), 26643–26649. (15) Napper, I. E. et al. Marine Pollution Bulletin 2016, 112 (1–2), 39–45. (16) Gavigan, J. et al. PLoS ONE 2020, 15 (9 September). (17) McIlwraith, H. K. et al. Marine Pollution Bulletin 2019, 139 (December 2018), 40–45. (18) Napper, I. E. et al. Science of the Total Environment 2020, 738. (19) Erdle, L. M. et al. Frontiers in Marine Science 2021.