APRIL 2026
FS: 26-04-C

FACT SHEET

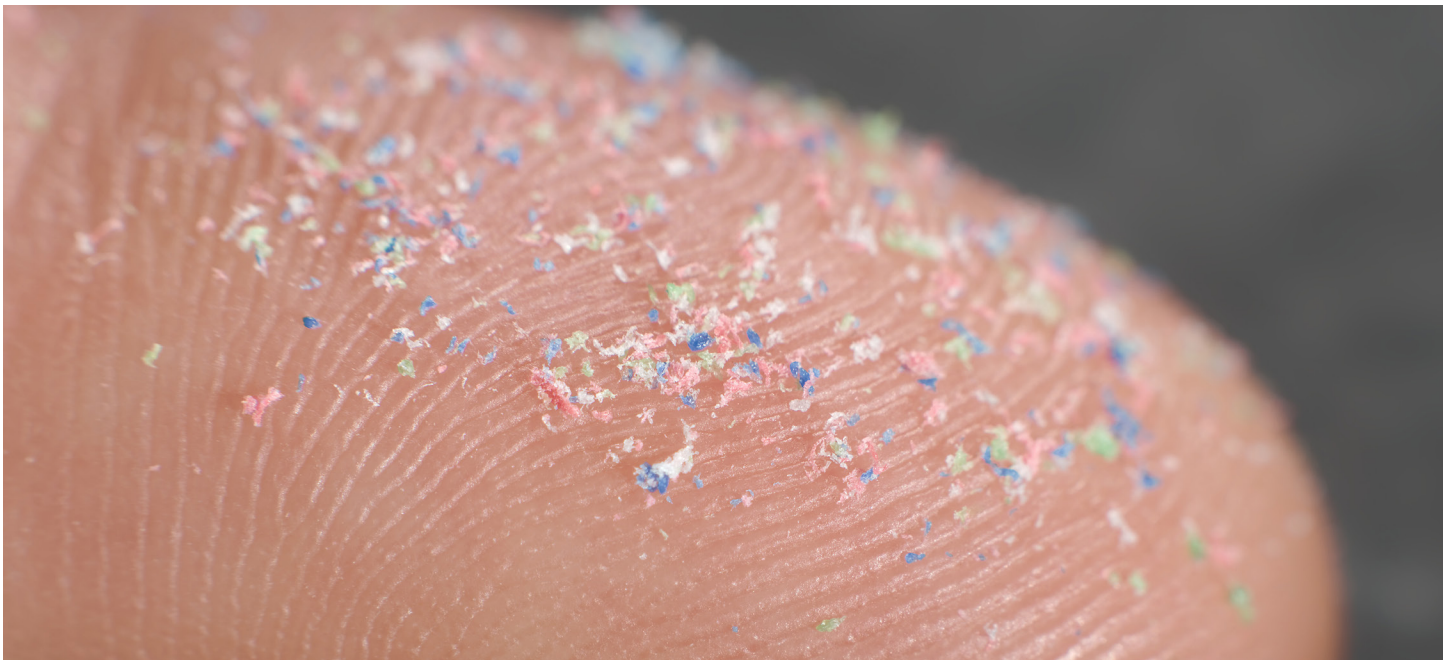
DOUBLE TROUBLE:
PFAS MICROPLASTICS ARE FOREVER

You thought PFAS, the "forever chemicals," were bad. You thought microplastics were bad. Did you know we also have PFAS microplastics—a particularly persistent and toxic form of microplastics? Yet, industry wants to continue producing and using PFAS plastics regardless of the costs to our health and the environment.

There's a lot of overlap in what makes PFAS (per- and polyfluoroalkyl substances) and microplastics dangerous: both **are toxic, can build up in living things, and can move quickly and last an incredibly long time in the environment.** Both PFAS and microplastics have already polluted the entire planet, being found in nearly everyone and practically everywhere, including in remote jungles and the deep ocean. PFAS stick around for so long in the environment that they have earned the nickname "forever chemicals."

PFAS plastics are widely used in consumer products including nonstick cookware, cosmetics, and textiles. Now scientists are finding PFAS-based microplastics from sources such as Teflon across the planet and in people, including in our blood, placenta, urine, lungs, and semen.[1] The continued use of PFAS plastics means that PFAS microplastics will continue to be created and released into the environment and our homes. Most of these uses of PFAS plastics are unnecessary, and safer alternatives are widely available.

Industry has been actively working to exempt PFAS plastics, such as Teflon, from regulations and legal phase outs, claiming that they're safe.[2] But no PFAS should get a free pass. We should phase out all unnecessary uses of PFAS, including PFAS plastics. This is a key step in stopping the spread of PFAS microplastics.



For more information, please contact:
Katie Pelch
kpelch@nrdc.org

www.nrdc.org
www.facebook.com/nrdc.org
www.twitter.com/NRDC

TOXIC TWINS

PFAS—the toxic "forever chemicals"

PFAS are a huge class of more than 14,000 man-made chemicals, many of which are toxic, persistent, and bioaccumulative.[3] PFAS are found nearly everywhere on the planet, including in the drinking water of more than 200 million Americans.[4] Alarmingly, PFAS have been detected in the breast milk, umbilical cord blood, or bloodstreams of virtually all Americans.[5]

Microplastics—the "micromonsters"[6]

Microplastics are tiny plastic particles now found virtually everywhere scientists look, from remote Arctic and Antarctic locations to our food and water and even within our own bodies.[7] They have been found in the human brain, heart, blood, lungs, veins, colon, liver, placenta, penis, testicles, and amniotic fluid.[8]

PFAS and microplastics are toxic and can be harmful at extremely low doses. PFAS have been linked to serious health effects such as cancer, hormone disruption, kidney and liver damage, developmental and reproductive harm, and damage to the immune system.[9] A growing body of evidence highlights how microplastics can harm our health, in particular our digestive, reproductive, and respiratory systems.[10] Smaller plastic particles, called nanoplastics, may be more harmful due to their increased ability to cross biological membranes.

PFAS and microplastics are extremely persistent in the environment. PFAS are called "forever chemicals" because they are so resistant to degradation that they will last in the environment for thousands of years.[11] Microplastics very slowly release their chemical monomers (chemical building blocks) and additives into the environment and break down into ever smaller micro- and nanoparticles over decades or longer.[12]

PFAS and microplastics are bioaccumulative, meaning they can build up in plants, animals, and even our bodies. The most well-studied PFAS stay in our bodies without breaking down for many years.[13] Microplastics are building up in the bodies of many animal species from tiny zooplankton and crustaceans to large fish, reptiles, birds, and even humans.[14]

PFAS and microplastics are highly mobile, able to move long distances through the air, ocean currents, rivers, and groundwater. PFAS are often found far away from the industrial or urban areas where they are made or used.[15] Microplastics have been found to travel through the atmosphere over 50 miles to remote mountain locations and have even been found deposited in Arctic snowfall.[16]

WHAT ARE PFAS PLASTICS AND PFAS MICROPLASTICS?

PFAS can be plastics—think "Teflon." Of the thousands of PFAS, some come in the form of plastics that are called fluoropolymers.[17] Fluoropolymers are billions of individual PFAS bound together to create a plastic material that can be used for everything from coating pans to making watch bands to industrial applications. "Teflon" is the well-known brand name of a widely used fluoropolymer called PTFE (polytetrafluoroethylene). Most of what we know about PFAS microplastics is based on research into PTFE-based microplastics.

PFAS plastics can break down into PFAS microplastics. Evidence is growing that PFAS plastics degrade into microplastics and nanoplastics under forces such as heat and physical wear and tear.[18] Cooking with non-stick coated materials made from fluoropolymers, for example, can produce millions of micro- and nanoplastics.[19] PFAS microplastics are also intentionally manufactured and can be added to consumer products, including cosmetics and coatings.[20]

Waste management is also a source of PFAS microplastics. Landfilling of products that contain PFAS plastics can release microplastics and lead to the contamination of nearby soil and groundwater.[21] Incineration of PFAS plastic creates toxic emissions, including PFAS microplastics, that can harm nearby communities and spread far beyond their source.[22] And wastewater treatment facilities are now known to directly release PFAS microplastics into water bodies.[23]

Just like PFAS and microplastics separately, PFAS microplastics are also a global contaminant. Today, PFAS microplastics are being found just about anywhere scientists look for them, such as:

- **People**—including our blood, placenta, and urine. PFAS microplastics are also one of the most common microplastics found in human lung tissue and semen.[24]
- **Wastewater treatment plant releases**, where they can be among the most predominant types of microplastics detected.[25]
- **Water sediments** of rivers, lakes, and oceans. PFAS microplastics can accumulate in these sediments because they are heavier than salt and fresh water.[26]
- **Aquatic species**, especially crabs and bottom-feeding species of fish that feed in the sediment where the PFAS microplastics are accumulating.[27]
- **Remote regions of the planet**, including the Arctic and Antarctic, which only underscores how capable they are of long-range atmospheric transport, similar to PFAS and microplastics in general.[28]

Research supports what already seems obvious: PFAS microplastics can be toxic to human health. Recent research highlights that PTFE microplastics were uniquely associated with reduced sperm counts in humans, in comparison to other microplastics.[29] Emerging research also reveals how the harmful effects of PFAS microplastics increase with smaller particle sizes and longer periods of exposure.[30]

PFAS PLASTICS ARE COMMON IN CONSUMER PRODUCTS

Despite clear health and environmental concerns, PFAS plastics have been widely used across the economy since the 1950s.[31] Commonly known uses of PFAS plastics in consumer products include nonstick cookware, personal care products and cosmetics, and textiles. However, since companies are typically not required to disclose their uses of PFAS, we do not know all the products and processes that contain or rely upon these forever chemicals. Phasing out the unnecessary use of these substances in common household consumer products is increasingly important and achievable.

© Shutterstock

Nonstick Cookware & Other Home Products

PFAS plastics are commonly found in our kitchens, where they are used in a broad range of nonstick cookware products including:

- Cookware and bakeware: pots, pans (roasting pans, frying pans, sauce pans, cake pans, loaf pans), muffin tins, and baking sheets[32]
- Cooking appliances: air fryers; rice cookers; griddles; electric skillets; sandwich presses; bread and popcorn machines; food processor blades; and snack, waffle and dog treat makers[33]

We know PFAS plastics are found in these products because manufacturers are now required by the states of California, Colorado, and Connecticut to disclose their use of PFAS in cookware products.[34]

Other examples of home products that may use a Teflon coating for nonstick applications include hair straighteners, curling irons and wands, hair crimpers, clothes irons, and manual razor blades.[35]

© BL via Unsplash

Cosmetics & Personal Care Products

PFAS plastics have been commonly used in cosmetics to enhance the spreadability of products and to give products more body or thickness.[36] There is already evidence that microplastics and PFAS can be absorbed through the skin, ingested, or inhaled, but the full extent to which PFAS microplastics enter the body from cosmetics and personal care products is not yet known.[37]

PTFE is the most widely used PFAS in cosmetics according to a December 2025 report from the U.S. Food and Drug Administration (FDA), which found PTFE listed as an ingredient in 28 percent of 1,744 products.[38] Cosmetics and personal care products with PTFE include:

- Eye makeup such as eye shadows, mascaras, eyelash and eyebrow adhesives, eyebrow pencils, eyeliners, and eye lotions. These products accounted for the greatest number of products containing PTFE, with mascara and eye shadows containing up to 13 percent PTFE by weight.
- Face makeup like blushes and rouges, face powders, foundations, lipsticks, and lip glosses.
- Hair products including shampoos, rinses, hair conditioners, and leave-on hair products.
- Skin care products for the face, neck, body, and hands, as well as other leave-on moisturizing products.

The use of PFAS plastics in cosmetics is declining in the United States, thanks to public pressure and regulations in California and other states.[39] But without further phase-outs, continued use of PFAS plastics in cosmetics will remain a concern.

Targeted phase-outs have been successful for other products. PFAS plastics used to be in dental floss, but there are many PFAS-free options and Minnesota and other states have now prohibited the sale of PFAS-based dental floss.[40] Even Oral-B, a company that has been resistant to acknowledging the harms of PFAS, has phased-out PTFE in its floss product Glide.[41] The passage of more state phase-outs would ensure that other companies do not continue or go back to using PTFE in their dental floss.


© Getty Images

Textiles

PFAS plastics have been commonly used to make textiles more water-, oil-, and stain-resistant. For example, durable water-repellent (DWR) finishes made with PFAS plastics can be applied to:

- Rainwear, including raincoats and hiking pants
- Sportswear, including hiking and running shoes
- Outdoor gear, including backpacks and tents
- Outdoor furniture, including cushions, upholstery, canopies, and pillows

Mandatory phase-outs of PFAS in textiles in places such as California, New York, and France, along with ecolabels such as OEKO-TEX, are driving brands to eliminate this unnecessary use of PFAS plastics.[42] Whether in response to new laws or to public concerns about these chemicals, REI, Patagonia, and The North Face have all eliminated PFAS plastics in their consumer products.[43] And Gore-Tex, a major manufacturer of DWR finishes for outdoor gear, is also transitioning away from PFAS.[44]

The sale of furniture containing PFAS plastics has been phased out in many states under the laws mentioned above. In addition, some retailers that sell outdoor furniture, including The Home Depot, IKEA, and Target have made commitments to eliminate all PFAS—including PFAS plastics—in outdoor furniture. However, other major retailers have yet to publicly commit to remove PFAS plastics from their products.[45]

URGENT ACTION IS NEEDED TO REDUCE PFAS MICROPLASTICS

The use of PFAS plastics in consumer products is largely unnecessary as there are already alternatives for many uses. Moreover, it is not worth the health and environmental risks. Consumers can take some actions to reduce their exposure to PFAS microplastics, but no one can buy their way out of the problem—we need comprehensive policy measures.

RECOMMENDATIONS FOR CONSUMERS

Look out for terms that may indicate the presence of PFAS plastics:

- "Water resistant/waterproof," "stain resistant/proof," "non-stick," "grease/oil -proof/-resistant," "easy clean," "easy glide," or "low friction" may indicate PFAS use.
- While looking for labels that say "PFAS-free" or "fluorine-free" may be helpful, be aware and vigilant that labels indicating a product is "PFOA-free" or "PFOS-free" are not the same as "PFAS-free." PFOA and PFOS are individual chemicals while PFAS is the entire class of chemicals.

Rethink product choices:

Cookware:

- Opt for safer alternatives like stainless steel, glass, carbon steel, ceramic non-stick, and cast iron.
- Use tools like the Clearya app to scan products and identify when PFAS use is disclosed.[46]
- Shoppers in Minnesota, Colorado, and Maine should feel more confident in their cookware purchases as these states have already enacted phase-outs of the sale and distribution of all cookware; Rhode Island, Connecticut and Vermont will join them in 2028.[47] California, Colorado, Rhode Island, and Connecticut require disclosure of PFAS in cookware, which can be found online.[48]

Cosmetic and personal care products:

- Prioritize purchasing from retailers that have committed to phasing out PFAS, such as Credo Beauty, Ulta Beauty, and Clean at Sephora.[49]
- Use tools like the Environmental Working Group's (EWG) Skin Deep or the Clearya app to scan products and identify when PFAS use is disclosed.[50]
- Check products for certifications such as Intertek PFAS-free and Environmental Working Group (EWG) Verified.[51]
- The sale and distribution of cosmetics and personal care products with PFAS is already prohibited in California, Colorado, Maine, Minnesota, and Vermont. It will be prohibited in Connecticut, Illinois, Oregon, and Rhode Island between 2027 and 2032.[52]

Apparel and Textiles:

- Select natural fibers like wool, untreated organic cotton, and wax-coated fabrics.
- Find and favor brands with public commitments to eliminate PFAS.[a]
- Check products for one of the following certifications: OEKO-TEX Standard 100, bluesign, or Global Organic Textile Standard (GOTS).[53]

a Brands with such commitments can be found here: https://pfascentral.org/pfas-free-products/.

- Laws prohibiting the sale and distribution of apparel with PFAS (and in some cases textiles more broadly) are already in effect in California, Minnesota, Maine, New York, Vermont. Similar laws will be coming into effect in Colorado, Connecticut, Rhode Island, and Washington between mid-2026 and 2028.[54]

RECOMMENDATIONS FOR POLICY MAKERS

First of all, PFAS are PFAS—do not exempt PFAS plastics or fluoropolymers like Teflon from the definition of PFAS or from the policy actions being taken to protect public health and the environment. Growing scientific evidence highlights that PFAS plastics are not safe and that they migrate and break down into microplastics.[55] The entire lifecycle of PFAS plastics is problematic and harmful.

A handful of states have phased out the use of PFAS plastics from specific product categories while others such as Minnesota and Maine are taking a more comprehensive approach to phasing out all unnecessary uses of PFAS.[56] But more states need to require phase-out to drive the national market entirely away from unnecessary uses of PFAS plastics. Ideally, national and international action prohibiting unnecessary uses of PFAS plastics would ensure that everyone is better protected from harm.

Policy makers should:

- Phase out unnecessary uses of PFAS plastics, including:
  - **Cookware and other home products.** It is important to include other nonstick/glide-related home products that may be made with PFAS plastics in future phase-outs, including hair straighteners, curling irons, clothes irons, and razor blades.
  - **Cosmetics and personal care products**. PFAS plastics are on the decline in cosmetics and other personal care products such as dental floss, but more action is needed to ensure the national market is PFAS-free.
  - **Textiles**. Ensure phase-outs include all textile products, including outdoor gear and outdoor furniture.
  - **Other product categories** including food packaging, cleaning products, ski wax, children's products, and paints.
- Avoid carve outs, especially those that exempt subgroups of PFAS, such as PFAS plastics/fluoropolymers. This is not scientifically supported, encourages manufacturers to simply transition into those exempted subgroups, and seriously undermines any protective action taken.
- Require disclosure of all PFAS, including PFAS plastics, in all consumer goods. Transparency is needed to ensure that companies are not slipping Teflon and other PFAS plastics into products we commonly use.

All unnecessary uses of PFAS plastics must stop now to reduce further harm to people and the planet.

We thank Mark Rossi for his contribution to this fact sheet.

Endnotes

1 Mohamed Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis: A Review," *Environmental Chemistry Letters* 24, no. 1 (2025): 27–59, https://doi.org/10.1007/s10311-025-01885-w; Chen Zhang et al., "Association of Mixed Exposure to Microplastics with Sperm Dysfunction: A Multi-Site Study in China," *eBioMedicine* 108 (October 2024): 105369, https://doi.org/10.1016/j.ebiom.2024.105369.

2 Katie Pelch, *The Definition Of PFAS Should Be Science Based*, February 20, 2024, https://www.nrdc.org/bio/katie-pelch/definition-pfas-should-be-science-based; Hiroko Tabuchi, "States Want to Ban 'Forever Chemicals' in Pans. These Chefs Say Don't Do It.," Climate, *The New York Times*, September 12, 2025, https://www.nytimes.com/2025/09/12/climate/rachael-ray-david-chang-pfas-forever-chemicals-cookware.html.

3 U.S. Environmental Protection Agency, "CompTox Chemicals Dashboard - Navigation Panel to PFAS Structure Lists," August 18, 2022, https://comptox.epa.gov/dashboard/chemical-lists/PFASSTRUCT; Safer States, "Why a Strong PFAS Definition Matters," March 2025, https://www.saferstates.org/wp-content/uploads/PFAS-Definition-Factsheet.pdf.

4 David Q. Andrews and Olga V. Naidenko, "Population-Wide Exposure to Per- and Polyfluoroalkyl Substances from Drinking Water in the United States," *Environmental Science & Technology Letters* 7, no. 12 (2020): 931–36, https://doi.org/10.1021/acs.estlett.0c00713.

5 Antonia M. Calafat et al., "Legacy and Alternative Per- and Polyfluoroalkyl Substances in the U.S. General Population: Paired Serum-Urine Data from the 2013-2014 National Health and Nutrition Examination Survey," *Environment International* 131 (October 2019): 105048, https://doi.org/10.1016/j.envint.2019.105048; Guomao Zheng et al., "Elevated Levels of Ultrashort- and Short-Chain Perfluoroalkyl Acids in US Homes and People," *Environmental Science & Technology* 57, no. 42 (2023): 15782–93, https://doi.org/10.1021/acs.est.2c06715; Julianne Cook Botelho et al., "Per- and Polyfluoroalkyl Substances (PFAS) Exposure in the U.S. Population: NHANES 1999–March 2020," *Environmental Research* 270 (April 2025): 120916, https://doi.org/10.1016/j.envres.2025.120916.

6 NRDC, "Microplastics Are Micromonsters," April 6, 2026, https://www.nrdc.org/stopmicromonsters.

7 Katie Pelch et al., "Microplastic Deluge: How These Small Plastic Particles Harm Our Health and the Environment," NRDC, June 2025, https://www.nrdc.org/sites/default/files/2025-06/microplastic_deluge_how_these_small_plastic_particles_harm_our_health_and_the_environment.pdf; Ilka Peeken et al., "Arctic Sea Ice Is an Important Temporal Sink and Means of Transport for Microplastic," *Nature Communications* 9, no. 1 (2018): 1505, https://doi.org/10.1038/s41467-018-03825-5; Kirstie Jones-Williams et al., "Microplastics in Antarctica - A Plastic Legacy in the Antarctic Snow?," *Science of The Total Environment* 966 (February 2025): 178543, https://doi.org/10.1016/j.scitotenv.2025.178543; Zhefan Ren et al., "Microplastics in the Soil-Groundwater Environment: Aging, Migration, and Co-Transport of Contaminants – A Critical Review," *Journal of Hazardous Materials* 419 (October 2021): 126455, https://doi.org/10.1016/j.jhazmat.2021.126455; Evangelos Danopoulos et al., "Microplastic Contamination of Drinking Water: A Systematic Review," *PLOS ONE* 15, no. 7 (2020): e0236838, https://doi.org/10.1371/journal.pone.0236838; Rebecca Talbot and Heejun Chang, "Microplastics in Freshwater: A Global Review of Factors Affecting Spatial and Temporal Variations," *Environmental Pollution* 292 (January 2022): 118393, https://doi.org/10.1016/j.envpol.2021.118393; Yize Wang et al., "Airborne Hydrophilic Microplastics in Cloud Water at High Altitudes and Their Role in Cloud Formation," *Environmental Chemistry Letters* 21, no. 6 (2023): 3055–62, https://doi.org/10.1007/s10311-023-01626-x; Qun Zhang et al., "A Review of Microplastics in Table Salt, Drinking Water, and Air: Direct Human Exposure," *Environmental Science & Technology* 54, no. 7 (2020): 3740–51, https://doi.org/10.1021/acs.est.9b04535; Stacey O'Brien et al., "There's Something in the Air: A Review of Sources, Prevalence and Behaviour of Microplastics in the Atmosphere," *Science of The Total Environment* 874 (May 2023): 162193, https://doi.org/10.1016/j.scitotenv.2023.162193; Alvise Vianello et al., "Simulating Human Exposure to Indoor Airborne Microplastics Using a Breathing Thermal Manikin," *Scientific Reports* 9, no. 1 (2019): 8670, https://doi.org/10.1038/s41598-019-45054-w; Gea Oliveri Conti et al., "Micro- and Nano-Plastics in Edible Fruit and Vegetables. The First Diet Risks Assessment for the General Population," *Environmental Research* 187 (August 2020): 109677, https://doi.org/10.1016/j.envres.2020.109677; Madeleine H. Milne et al., "Exposure of U.S. Adults to Microplastics from Commonly-Consumed Proteins," *Environmental Pollution* 343 (February 2024): 123233, https://doi.org/10.1016/j.envpol.2023.123233.

8 Luís Fernando Amato-Lourenço et al., "Microplastics in the Olfactory Bulb of the Human Brain," *JAMA Network Open* 7, no. 9 (2024): e2440018, https://doi.org/10.1001/jamanetworkopen.2024.40018; Yunxiao Yang et al., "Detection of Various Microplastics in Patients Undergoing Cardiac Surgery," *Environmental Science & Technology* 57, no. 30 (2023): 10911–18, https://doi.org/10.1021/acs.est.2c07179; Heather A. Leslie et al., "Discovery and Quantification of Plastic Particle Pollution in Human Blood," *Environment International* 163 (May 2022): 107199, https://doi.org/10.1016/j.envint.2022.107199; Lauren C. Jenner et al., "Detection of Microplastics in Human Lung Tissue Using μFTIR Spectroscopy," *Science of The Total Environment* 831 (July 2022): 154907, https://doi.org/10.1016/j.scitotenv.2022.154907; Jeanette M. Rotchell et al., "Detection of Microplastics in Human Saphenous Vein Tissue Using μFTIR: A Pilot Study," *PLOS ONE* 18, no. 2 (2023): e0280594, https://doi.org/10.1371/journal.pone.0280594; Yusof Shuaib Ibrahim et al., "Detection of Microplastics in Human Colectomy Specimens," *JGH Open* 5, no. 1 (2021): 116–21, https://doi.org/10.1002/jgh3.12457; Thomas Horvatits et al., "Microplastics Detected in Cirrhotic Liver Tissue," *eBioMedicine* 82 (August 2022): 104147, https://doi.org/10.1016/j.ebiom.2022.104147; Antonio Ragusa et al., "Plasticenta: First Evidence of Microplastics in Human Placenta," *Environment International* 146 (January 2021): 106274, https://doi.org/10.1016/j.envint.2020.106274; Jason Codrington et al., "Detection of Microplastics in the Human Penis," *International Journal of Impotence Research* (June 19, 2024): 1–7, https://doi.org/10.1038/s41443-024-00930-6; Qiancheng Zhao et al., "Detection and Characterization of Microplastics in the Human Testis and Semen," *Science of The Total Environment* 877 (June 2023): 162713, https://doi.org/10.1016/j.scitotenv.2023.162713; Jiyang Xue et al., "Microplastics in Maternal Amniotic Fluid and Their Associations with Gestational Age," *Science of The Total Environment* 920 (April 2024): 171044, https://doi.org/10.1016/j.scitotenv.2024.171044.

9 ATSDR, *Toxicological Profile for Perfluoroalkyls* (2021), https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf; Shelia Zahm et al., "Carcinogenicity of Perfluorooctanoic Acid and Perfluorooctanesulfonic Acid," *The Lancet Oncology* (November 2023): S1470204523006228, https://doi.org/10.1016/S1470-2045(23)00622-8; U.S. Environmental Protection Agency, *PFAS National Primary Drinking Water Regulation*, Federal Register 89 (2024), https://www.federalregister.gov/documents/2024/04/26/2024-07773/pfas-national-primary-drinking-water-regulation.

10 Nicholas Chartres et al., "Effects of Microplastic Exposure on Human Digestive, Reproductive, and Respiratory Health: A Rapid Systematic Review," *Environmental Science & Technology* 58, no. 52 (2024): 22843–64, https://doi.org/10.1021/acs.est.3c09524; European Commission, *Nanoplastics : State of Knowledge and Environmental and Human Health Impacts*, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2779/632649.

11 D. J. Ivy et al., "Global Emission Estimates and Radiative Impact of C_4F_{10}, C_5F_{12}, C_6F_{14}, C_7F_{16} and C_8F_{18}," *Atmospheric Chemistry and Physics* 12, no. 16 (2012): 7635–45, https://doi.org/10.5194/acp-12-7635-2012; Bridger J. Ruyle et al., "Centurial Persistence of Forever Chemicals at Military Fire Training Sites," *Environmental Science & Technology* 57, no. 21 (2023): 8096–106, https://doi.org/10.1021/acs.est.3c00675.

12 ECHA, *Annex to the Annex XV Restriction Report* (2019), https://echa.europa.eu/documents/10162/db081bde-ea3e-ab53-3135-8aaffe66d0cb; Grant Currin, "Researchers Discover Why Plastic Sheds Dangerous Fragments," Columbia Engineering, April 7, 2025, https://www.engineering.columbia.edu/about/news/researchers-discover-why-plastic-sheds-dangerous-fragments.

13 Isabella Rosato et al., "Estimation of Per- and Polyfluoroalkyl Substances (PFAS) Half-Lives in Human Studies: A Systematic Review and Meta-Analysis," *Environmental Research* 242 (February 2024): 117743, https://doi.org/10.1016/j.envres.2023.117743.

14 Xuemei Li et al., "Occurrence, Bioaccumulation, and Risk Assessment of Microplastics in the Aquatic Environment: A Review," *Water* 15, no. 9 (2023): 1768, https://doi.org/10.3390/w15091768; Michaela E. Miller et al., "Bioaccumulation and Biomagnification of Microplastics in Marine Organisms: A Review and Meta-Analysis of Current Data," *PLoS ONE* 15, no. 10 (2020): e0240792, https://doi.org/10.1371/journal.pone.0240792; Marco Parolini et al., "A Global Perspective on Microplastic Bioaccumulation in Marine Organisms," *Ecological Indicators* 149 (May 2023): 110179, https://doi.org/10.1016/j.ecolind.2023.110179; Alexander J. Nihart et al., "Bioaccumulation of Microplastics in Decedent Human Brains," *Nature Medicine* (February 3, 2025): 1–6, https://doi.org/10.1038/s41591-024-03453-1.

15 Anna J. Miller et al., "Global Inventory of Fluoropolymer Production Plants and Their Associated PFAS Environmental Contamination," *Environmental Science & Technology*, (April 8, 2026) https://doi.org/10.1021/acs.est.5c18001; Joost Dalmijn et al., "Emission Inventory of PFASs and Other Fluorinated Organic Substances for the Fluoropolymer Production Industry in Europe," *Environmental Science: Processes & Impacts* 26, no. 2 (2024): 269–87, https://doi.org/10.1039/D3EM00426K; Emma L. D'Ambro et al., "Characterizing the Air Emissions, Transport, and Deposition of per- and Polyfluoroalkyl Substances from a Fluoropolymer Manufacturing Facility," *International Journal of Environmental Science and Technology : IJEST* 55, no. 2 (2021): 862–70, https://doi.org/10.1021/acs.est.0c06580.

16 Janice Brahney et al., "Plastic Rain in Protected Areas of the United States," *Science* 368, no. 6496 (2020): 1257–60, https://doi.org/10.1126/science.aaz5819; Steve Allen et al., "Atmospheric Transport and Deposition of Microplastics in a Remote Mountain Catchment," *Nature Geoscience* 12, no. 5 (2019): 5, https://doi.org/10.1038/s41561-019-0335-5; Melanie Bergmann et al., "White and Wonderful? Microplastics Prevail in Snow from the Alps to the Arctic," *Science Advances* 5, no. 8 (2019): eaax1157, https://doi.org/10.1126/sciadv.aax1157.

17 Organisation for Economic Co-operation and Development (OECD), *Synthesis Report on Understanding Fluoropolymers and Their Life Cycle*, no. 73, OECD Series on Risk Management (November 14, 2025), https://doi.org/10.1787/35b035df-en; Teflon, "Teflon Products," Chemours, accessed February 8, 2026, https://www.teflon.com/en/products.

18 Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis"; OECD, *Fluoropolymers and Their Life Cycle*.

19 Yunlong Luo et al., "Raman Imaging for the Identification of Teflon Microplastics and Nanoplastics Released from Non-Stick Cookware," *Science of The Total Environment* 851 (December 2022): 158293, https://doi.org/10.1016/j.scitotenv.2022.158293; Matthew Cole et al., "Microplastic and PTFE Contamination of Food from Cookware," *Science of The Total Environment* 929 (June 2024): 172577, https://doi.org/10.1016/j.scitotenv.2024.172577.

20 OECD, *Fluoropolymers and Their Life Cycle*; Cosmetic Ingredient Review, "Safety Assessment of Polyfluorinated Polymers as Used in Cosmetics," 2018, https://www.cir-safety.org/sites/default/files/fluoro092018FR.pdf; Shandong Hengyi New Material Technology Co., "PTFE Micropowder In Coating," Hengy, July 24, 2024, https://www.chinafluoropolymer.com/news/ptfe-micropowder-in-coating-79276324.html.

21 Ana L. P. Silva et al., "Microplastics in Landfill Leachates: The Need for Reconnaissance Studies and Remediation Technologies," *Case Studies in Chemical and Environmental Engineering* 3 (June 2021): 100072, https://doi.org/10.1016/j.cscee.2020.100072; Ryan Moore, "PFAS-Impacted Groundwater an Emerging Issue for Landfills: Solving the Challenge with a New Approach," *Waste Advantage Magazine*, March 2, 2021, https://wasteadvantagemag.com/pfas-impacted-groundwater-an-emerging-issue-for-landfills-solving-the-challenge-with-a-new-approach/.

22 Rainer Lohmann et al., "Are Fluoropolymers Really of Low Concern for Human and Environmental Health and Separate from Other PFAS?," *Environmental Science & Technology* 54, no. 20 (2020): 12820–28, https://doi.org/10.1021/acs.est.0c03244.

23 OECD, *Fluoropolymers and Their Life Cycle*.

24 Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis"; Zhang et al., "Association of Mixed Exposure to Microplastics with Sperm Dysfunction."

25 Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis"; OECD, *Fluoropolymers and Their Life Cycle*.

26 Ibid.

27 Ibid.

28 Ibid.

29 Zhang et al., "Association of Mixed Exposure to Microplastics with Sperm Dysfunction."

30 Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis"; Pramod Bahadur K C et al., "Polytetrafluorethylene Microplastic Particles Mediated Oxidative Stress, Inflammation, and Intracellular Signaling Pathway Alteration in Human Derived Cell Lines," *Science of The Total Environment* 897 (November 2023): 165295, https://doi.org/10.1016/j.scitotenv.2023.165295.

31 Rebecca Altman, "How 20th-Century Synthetics Altered the Very Fabric of Us All," *Aeon*, February 2, 2019, https://aeon.co/essays/how-20th-century-synthetics-altered-the-very-fabric-of-us-all; Lauren Richter and Grace Poudrier, "PFAS Ubiquity as Corporate Accomplishment: Whiteness in Early Teflon Advertisements," *Geographical Research* 63, no. 4 (2025): 480–93, https://doi.org/10.1111/1745-5871.70036; OECD, *Fluoropolymers and Their Life Cycle*.

32 All-Clad, "About Our Nonstick," accessed January 25, 2026, https://www.all-clad.com/aboutnonstick?srsltid=AfmBOorCAMZSs5A6MtaZ4rxWFpQplb9DpsWT5JOiPhi-VBCcjhWY3wZz; Calphalon, "Product Material Disclosures," Calphalon, accessed January 18, 2026, https://www.calphalon.com/product-disclosures.html?srsltid=AfmBOorDIYBsQv074qKzLzOrMM23gDBJSPtNgB1EaH-WtGJ_VJ4LUjNk; Made In, "California Safer Food Packaging and Cookware Act (Ab 1200) Disclosure," Made In, accessed January 18, 2026, https://madeincookware.com/pages/ab-1200; Misen, "California Safer Food Packaging and Cookware Act (Ab-1200) and Colorado Hb22-1345 Disclosures," Misen, accessed January 25, 2026, https://misen.com/pages/disclosures; Viking, "Viking Product Disclosures," Viking, accessed January 18, 2026, https://www.vikingculinaryproducts.com/pages/disclosures.

33 Dash, "Cookware & Kitchen Electrics Chemicals Disclosure," Dash, accessed February 8, 2026, https://bydash.com/pages/ab1200?srsltid=AfmBOoqIRSXKkSxggFrVll8StHPWMTlml9ymZFRBGBOQU3-OAXg-Z5go&utm.

34 Plant-Based Food Packaging: Cookware: Hazardous Chemicals., AB 1200, CA State Legislature (2021), https://legiscan.com/CA/text/AB1200/id/2435956; Concerning Measures to Increase Protections from Perfluoroalkyl and Polyfluoroalkyl Chemicals., House Bill 22-1345, General Assembly of the State of Colorado, https://content.leg.colorado.gov/sites/default/files/2022a_1345_signed.pdf; An Act Concerning the Use of PFAS in Certain Products., Substitute Senate Bill No. 292, Senate and House of Representatives in the Connecticut General Assembly, https://www.cga.ct.gov/2024/ACT/PA/PDF/2024PA-00059-R00SB-00292-PA.PDF.

35 Oli, "Elegantly and Stylishly: How to Choose the Perfect Hair Straightener?," Glamot, June 16, 2023, https://www.glamot.com/blog/25270/elegantly-and-stylishly-how-to-choose-the-perfect-hair-straightener; "25 – 18 Curling Black," Evalectric, accessed February 8, 2026, https://evalectric.com/product/25-18-curling-black/; "Wilkinson Sword Men's Double Edge Razor Blade Refills, 5 Ct," Walmart, accessed February 8, 2026, https://www.walmart.com/ip/Wilkinson-Sword-Mens-Double-Edge-Razor-Blade-Refills-5-Ct/42865468; "Amazon Basics 1200W 10" Steam Iron, With Non-Stick Teflon Soleplate, 5 Fl Oz Water Tank (150 ML), Auto Shut-Off, Anti-Drip, Anti-Calcification, Thermostat, 6.5Ft Cord, Gray," Amazon, accessed April 2, 2026, https://www.amazon.com/Amazon-Basics-Teflon-Soleplate-1200-Watt/dp/B08CHGKHYG/ref=sr_1_1_ffob_sspa?dib=eyJ2IjoiMSJ9.esno5JN5MoGn1uSsBBjByEKqwg-SbnE3nMG_PAmyp-ai_x0jLQ1g755I0WIIChbja7cebIBXL8kODgEp7jglf55CnCIIRnhjkhQOnPb7oanIaXkU84ZwAck9TjqaPzq-Vj50Y1CyXs9fNFfNNhAUXrw6VJDvFJOrpKnAyuDuwvPupeDqA6awYK3O89kfVkiPAkL3KMYCyi4QK3TizYjJE0qbihA5kYrtW-_kI_sOHoI.dgqgUrhelDIFXd1rPjq5b4J678tZX2rLaNlyyRfU6VQ&dib_tag=se&keywords=Professional%2BTeflon%2BSole-plate%2BSteam%2BIron&qid=1775151970&sr=8-1-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&th=1.

36 U.S. Food and Drug Administration, "Report on the Use of PFAS in Cosmetic Products and Associated," December 2025, https://www.fda.gov/media/190319/download.

37 Anna Kukkola et al., "Beyond Microbeads: Examining the Role of Cosmetics in Microplastic Pollution and Spotlighting Unanswered Questions," *Journal of Hazardous Materials* 476 (September 2024): 135053, https://doi.org/10.1016/j.jhazmat.2024.135053; Ponnusamy Manogaran Gopinath et al., "Prospects on the Nano-Plastic Particles Internalization and Induction of Cellular Response in Human Keratinocytes," *Particle and Fibre Toxicology* 18, no. 1 (2021): 35, https://doi.org/10.1186/s12989-021-00428-9; Oddný Ragnarsdóttir et al., "Dermal Bioavailability of Perfluoroalkyl Substances Using *in Vitro* 3D Human Skin Equivalent Models," *Environment International* 188 (June 2024): 108772, https://doi.org/10.1016/j.envint.2024.108772; Ji-Seok Han et al., "Subacute Dermal Toxicity of Perfluoroalkyl Carboxylic Acids: Comparison with Different Carbon-Chain Lengths in Human Skin Equivalents and Systemic Effects of Perfluoroheptanoic Acid in Sprague Dawley Rats," *Archives of Toxicology* 94, no. 2 (2020): 523–39, https://doi.org/10.1007/s00204-019-02634-z.

38 U.S. Food and Drug Administration, Report on the Use of PFAS.

39 Ibid.

40 Douglas Fischer, "Tests Find PFAS Abundant in Some Dental Floss," *Environmental Health News*, September 14, 2022, https://www.ehn.org/pfas-floss; Sydney Cook, "How to Choose Dental Floss Without PFAS and Other Harmful Chemicals," Consumer Reports, January 18, 2025, https://www.consumerreports.org/toxic-chemicals-substances/dental-floss-without-pfas-and-other-harmful-chemicals-a9722832754/.

41 Oral-B, "Dental Floss Types," Oral-B, December 9, 2025, https://oralb.com/en-us/oral-health/why-oral-b/floss/dental-floss-types-the-pros-and-cons/; James R. Hood et al., "Oral-B Says It Has Removed PFAS-Linked Material from Glide Dental Floss," January 12, 2026, https://www.consumeraffairs.com/news/oral-b-says-it-has-removed-pfas-linked-material-from-glide-dental-floss-011226.html; Alan Dalewitz, on Behalf of Himself and All Others Similarly Situated, Plaintiff, v. The Procter & Gamble Company, One Procter & Gamble Plaza, Cincinnati, OH 45201, No. 22-7323 (United States District Court Southern District of New York August 2022), https://www.cmbg3.com/library/ProcterGambleFlossComplaint-8-22.pdf.

42 Product Safety: Textile Articles: Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), AB 1817 (2022): https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1817; Prohibition against the Use of Perfluoroalkyl and Polyfluoroalkyl Substances in Apparel and Outdoor Apparel for Severe Wet Conditions, SECTION 37-0121 (2024): https://www.nysenate.gov/legislation/laws/ENV/37-0121; Decree No. 2025-1376 of 28 December 2025 Relating to the Prevention of Risks Resulting from Exposure to Perfluoroalkyl and Polyfluoroalkyl Substances (2025), https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000053201526; Hohenstein, "OEKO-TEX® General Ban on PFAS," Hohenstein Americas, accessed February 6, 2026, https://www.hohenstein.us/en-us/oeko-tex/restrictions-and-testing/pfas.

43 Katie Oram and Ella Hall, "REI Co-Op Trailmade Rain Jacket Sustainability Report," Better Trail, May 7, 2025, https://bettertrail.com/sustainability/rei-co-op-trailmade-rain-jacket-report; Patagonia, "Made Without PFAS," Patagonia, accessed February 7, 2026, https://www.patagonia.com/our-footprint/pfas.html; The North Face, "PFAS," The North Face, accessed February 7, 2026, https://www.tnftrainingacademy.com/manual/key-product-technology/pfas.html.

44 GORE-TEX, "Responsible Performance, Science-Led Innovation," GORE-TEX Brand, accessed February 7, 2026, https://www.gore-tex.com/sustainability/science-led-innovation.

45 The Home Depot, "Our Commitment," Eco Actions: The Home Depot, accessed February 7, 2026, https://ecoactions.homedepot.com/our-commitment/; IKEA, "Our View on Chemicals," IKEA, accessed February 7, 2026, https://www.ikea.com/global/en/our-business/our-view-on/chemicals/; Target, "Chemicals," Target, accessed February 7, 2026, https://corporate.target.com/sustainability-governance/responsible-resource-use/chemicals; Toxic-Free Future, "2024 Retailer Report Card: Key Findings," 2024, https://toxicfreefuture.org/retailer-report-card/2024/key-findings/.

46 Clearya, "Nontoxic Shopping Made Easy," Clearya, accessed February 8, 2026, https://www.clearya.com/.

47 Environment, Natural Resources, Climate, and Energy Finance and Policy Bill., HF 2310 (2023), https://www.revisor.mn.gov/bills/93/2023/0/HF/2310/versions/4/; Perfluoroalkyl And Polyfluoroalkyl Chemicals, Nos. SB24-081 (2024), https://leg.colorado.gov/bills/sb24-081; An Act to Amend the Laws Relating to the Prevention of Perfluoroalkyl and Polyfluoroalkyl Substances Pollution and to Provide Additional Funding, LD 1537 (2024), https://legiscan.com/ME/text/LD1537/id/2982292; Relating to Health and Safety--Consumer PFAS Ban Act of 2024, SB 2152 (2024), https://webserver.rilegislature.gov/BillText/BillText24/SenateText24/S2152Aaa.pdf; An Act Concerning the Use of PFAS in Certain Products, SB 292 (2024). https://legiscan.com/CT/bill/SB00292/2024; An Act Relating to the Phaseout of Consumer Products Containing Added Perfluoroalkyl and Polyfluoroalkyl Substances, H 238 (2025). https://legislature.vermont.gov/Documents/2026/Docs/ACTS/ACT054/ACT054%20As%20Enacted.pdf.

48 CA AB1200; CO HB 22-1345; CT 24-59; RI S2152.

49 Credo Beauty, "The Dirty List," Credo Beauty, accessed April 17, 2026, https://credobeauty.com/pages/the-dirty-list-1; Ulta Beauty, "Made Without List," accessed February 8, 2026, https://www.ulta.com/discover/conscious-beauty/clean-ingredients/made-without; Sephora, "Inspiring More Responsible Beauty," Sephora, accessed February 8, 2026, https://www.sephora.com/beauty/clean-planet-aware.

50 Environmental Working Group, "Your Guide to Safer Personal Care Products," EWG's Skin Deep, accessed February 8, 2026, https://www.ewg.org/skindeep; Clearya, "Nontoxic Shopping Made Easy," Clearya, accessed February 8, 2026, https://www.clearya.com/.

51 Intertek, "PFAS Free Product Certification," Intertek, accessed February 7, 2026, https://www.intertek.com/sustainability/certification/pfas-free/; Environmental Working Group, "A Mark You Can Trust," EWG Verified, accessed February 7, 2026, https://www.ewg.org/ewgverified/.

52 The laws in California, Connecticut, Vermont, and Washington also prohibit the manufacture of cosmetics and personal care products in the state. See Safer States, "Safer States: Bill Tracker" for effective dates in different states; Cosmetic Products: Safety., AB 2771, Health and Safety Code (2022): https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2771; Perfluoroalkyl And Polyfluoroalkyl Chemicals, Nos. HB22-1345 (2022): https://leg.colorado.gov/bills/hb22-1345; An Act to Amend the Laws Relating to the Prevention of Perfluoroalkyl and Polyfluoroalkyl Substances Pollution and to Provide Additional Funding, LD 1537 (2024): https://legislature.maine.gov/LawMakerWeb/summary.asp?ID=280088380; An Act Relating to Regulating Consumer Products Containing Perfluoroalkyl and Polyfluoroalkyl Substances or Other Chemicals., S.25, Act 131, (2024): https://legislature.vermont.gov/bill/status/2024/S.25; An Act Concerning the Use of PFAS in Certain Products, SB 292 (2024): https://www.cga.ct.gov/2024/ACT/PA/PDF/2024PA-00059-R00SB-00292-PA.PDF; Public Act 104-0231, HB2516 (2025): https://ilga.gov/legislation/PublicActs/View/104-0231; Relating to Chemicals Used in Cosmetic Products., SB 546 (2023): https://olis.oregonlegislature.gov/liz/2023R1/Downloads/MeasureDocument/SB546; Relating to Health and Safety--Consumer PFAS Ban Act of 2024, SB 2152 (2024): https://webserver.rilegislature.gov/BillText/BillText24/SenateText24/S2152Aaa.pdf.

53 Bluesign, "The Fashion Industry's Shift to PFAS-Free Clothing," Bluesign, March 25, 2025, https://www.bluesign.com/en/pfas-in-clothing/; Global Organic Textile Standard, "GOTS Version 7.0 Released: Major Leap Forward for the Sustainable All-Inclusive Solution for Organic Fibre Processing," Global Organic Textile Standard, 2026, https://global-standard.org/news/gots-annual-pr-2023; Hohenstein, "OEKO-TEX® General Ban on PFAS."

54 The laws in California, Connecticut, Rhode Island, Vermont, and Washington also prohibit the manufacture of these products with PFAS. See Safer States, "Safer States: Bill Tracker" for effective dates in states; CA AB 1817 (2022): https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1817; Environment, Natural Resources, Climate, and Energy Finance and Policy Bill., HF 2310 (2023): https://www.revisor.mn.gov/bills/93/2023/0/HF/2310/versions/4/; An Act to Amend the Laws Relating to the Prevention of Perfluoroalkyl and Polyfluoroalkyl Substances Pollution and to Provide Additional Funding, LD 1537 (2024): https://legiscan.com/ME/text/LD1537/id/2982292; NY Section 37-0121 (2024): https://www.nysenate.gov/legislation/laws/ENV/37-0121; An Act Relating to Regulating Consumer Products Containing Perfluoroalkyl and Polyfluoroalkyl Substances or Other Chemicals., S.25, Act 131, (2024): https://legislature.vermont.gov/bill/status/2024/S.25; Perfluoroalkyl And Polyfluoroalkyl Chemicals, Nos. SB24-081 (2024): https://leg.colorado.gov/bills/sb24-081; An Act Concerning the Use of PFAS in Certain Products, SB 292 (2024): https://www.cga.ct.gov/2024/ACT/PA/PDF/2024PA-00059-R00SB-00292-PA.PDF; Relating to Health and Safety—Consumer PFAS Ban Act of 2024, SB 2152 (2024): https://webserver.rilegislature.gov/BillText/BillText24/SenateText24/S2152Aaa.pdf; Safer Products Restrictions and Reporting, Chapter 173–337 WACLast Update: November 20, 2025: https://app.leg.wa.gov/WAC/default.aspx?cite=173-337&full=true&pdf=true.

55 Alaraby et al., "Polytetrafluoroethylene Microplastic Properties, Pollution, Toxicity and Analysis"; OECD, *Fluoropolymers and Their Life Cycle*.

56 Maine Department of Environmental Protection, "PFAS in Products"; Minnesota Pollution Control Agency, "2025 PFAS Prohibitions."