

Disposable Wipes

Materials, Chemicals, and Environmental Impacts

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Executive Summary

Disposable wipes are widely used for infant care, personal hygiene, makeup removal, household cleaning, travel, elder care, and other routine tasks. Their convenience, however, can come with human health and environmental concerns related to the materials used to make the wipe, the chemical ingredients in the formulation, and disposal practices. Many wipes contain plastic-based substrates such as polyethylene terephthalate (PET) or polypropylene that persist in the environment and can contribute to microplastic pollution. Certain chemical ingredients may also present concerns depending on the specific substance and exposure, including contaminants associated with ethoxylated ingredients, some cyclic siloxanes, and undisclosed fragrance ingredients. In addition, most wipes should not be flushed because they can contribute to sewer blockages and wastewater-system problems.

Purpose and Scope

This report examines key human health and environmental considerations associated with disposable wipes, with a focus on the materials used to manufacture wipes, chemical ingredients used in wipe formulations, environmental persistence and pollution, and impacts associated with disposal and flushability. It also considers how material selection, ingredient composition, and end-of-lifecycle practices can influence the overall health and environmental profile of a wipe product. This report is intended to support more informed evaluation of disposable wipes by outlining relevant areas of concern and providing practical guidance for assessing wipe materials, ingredient disclosures, product claims, and disposal practices.

Wipe Materials and Environmental Impact

Many disposable wipe substrates are made partly or entirely from plastic, most commonly PET and polypropylene (PP), or from cotton blended with plastic resins. These materials may feel textile-like, but plastic-based substrates generally do not readily biodegrade and can persist or degrade into smaller particles in the environment.^{1, 2}

Plastic Pollution and Microplastics

Plastic waste is persistent and only a small portion is recycled. The Organization for Economic Co-operation and Development (OECD) estimated that 9% of global plastic waste was ultimately recycled in 2019. Short-term uses, which include packaging, consumer products, and textiles, account for a large share of plastic waste. Plastic leakage can degrade into microplastics, and synthetic textiles may also shed microfibers.²

Microplastics have been detected across marine and freshwater environments and in drinking water. Aquatic organisms can ingest them, and transfer through food webs occurs. Human exposure occurs through food, water, and air, but the magnitude and clinical significance of health effects remain under active investigation.^{3, 4}

Plastic debris can also harm wildlife through entanglement or smothering. In addition, plastics may contain or carry chemical substances that can be released during weathering or digestion. Improperly managed land-based waste is a major source of plastic leakage, while marine activities and textile-fiber shedding also contribute.²

Polyethylene Terephthalate (PET)

PET, recycling code #1, is widely used in beverage bottles, polyester textiles, and wipe materials. It is persistent in the environment. Antimony compounds are commonly used as catalysts in PET production, and antimony has been measured in polyester textiles. The International Agency for Research on Cancer (IARC) now classifies trivalent antimony compounds as probably carcinogenic to humans (Group 2A). These hazard classifications do not establish that antimony migrates from wipes to skin at a harmful dose; wipe-specific migration data remains limited.^{5, 6}

Polypropylene (PP)

Polypropylene, recycling code #5, is used in packaging, diapers, feminine-care products, carpeting, and wipes. It is not readily biodegradable and can fragment into microplastics, including through environmental weathering and ultraviolet exposure.^{1, 2}

Cotton and Cotton-Plastic Blends

Cotton avoids the use of a plastic fiber when used as a 100% cotton substrate, but conventional cotton production can involve substantial water, pesticide, and other agricultural inputs. Although water use varies considerably by region and production method, estimates suggest that producing enough cotton for a single T-shirt can require roughly 700 gallons of water. Genetically engineered varieties are also common in US cotton production. The US Department of Agriculture (USDA) reports that more than 90% of US upland cotton is produced using genetically engineered varieties. Cotton-plastic blends carry considerations associated with both fiber types.^{1, 7}

Chemical Ingredients of Concern

Wipe formulations commonly contain water, humectants or moisturizers, preservatives, surfactants, emulsifiers, fragrance ingredients, and, in some products, antimicrobials. An evaluation should consider the specific substance, its concentration and function, how exposure may occur, and any relevant impurities, rather than treating all ingredients within a category the same.¹

Ethoxylated Ingredients and Polyethylene Glycol (PEG) Compounds

PEG compounds are commonly produced by ethoxylation. This manufacturing process can generate 1,4-dioxane as a byproduct. The US Food and Drug Administration (FDA) identifies PEG-, polyethylene-, polyoxyethylene-, and chemicals ending in “-eth-,” and “-oxynol-” as categories which carry the risk of 1,4-dioxane production. Residual ethylene oxide is also a serious concern for ethoxylated materials. This means that presence of a PEG indicates a manufacturing process associated with contamination risk and may result in harmful residual levels of 1,4-dioxane and ethylene oxide in the finished product.⁸

Siloxanes and Silanes

Siloxanes and silanes may be used in wipe formulations for functions such as conditioning, emollience, or improving spreadability and skin feel. Particular concern has focused on the cyclic siloxanes D4, D5, and D6 because of their environmental persistence and potential to bioaccumulate. Under EU criteria, D4 has been identified as persistent, bioaccumulative, and toxic (PBT) and very persistent and very bioaccumulative (vPvB), while D5 and D6 are identified as vPvB and may also

meet PBT criteria when they contain at least 0.1% D4.⁹ These properties raise concern about the potential for these substances to persist in the environment, bioaccumulate in organisms, and contribute to longer-term aquatic ecosystem impacts.

Fragrance Ingredients

Fragrance may be used to provide scent or mask odors. Under US cosmetic labeling rules, fragrance ingredients may be listed generally as “Fragrance” rather than individual ingredients.¹⁰ Because of this, it can be difficult to evaluate the hazards of each substance present. Different fragrance ingredients can have different toxicity and sensitization concerns, making lack of disclosure the primary issue rather than fragrance ingredients as a whole.

Parabens

Parabens are preservatives used to help prevent microbial growth in personal care products, including wipes. Some parabens have demonstrated estrogenic activity, raising concern about their potential to interfere with normal hormone signaling.¹¹ Although the strength of this activity varies among types of parabens, their endocrine-disrupting potential remains the primary reason for concern. For wipes used frequently or on sensitive areas of the body, paraben-free formulations can help reduce unnecessary exposure to these compounds.

Vitamin A Compounds

Certain Vitamin A compounds, particularly retinoids, are associated with developmental and reproductive toxicity concerns. Retinoids can interfere with normal fetal development, and excessive Vitamin A exposure has been linked to birth defects and other adverse developmental effects.¹²

Because wipes may be used frequently and on sensitive areas of the body, limiting unnecessary exposure to these compounds can help reduce potential risk.

Antibacterial Ingredients

Triclosan remains a relevant example of an antimicrobial ingredient of concern. The FDA has determined that it cannot be used in nonprescription consumer antiseptic wash products unless specifically approved. Silver ingredients can raise health and environmental concerns, and their risk can vary based on the form of silver, particle size, concentration, and route of exposure. In 2026, the Scientific Committee on Consumer Safety (SCCS) concluded that micron-sized particulate silver is safe for certain cosmetic uses at specified concentrations, although caution is still warranted, and consumers may wish to avoid silver-containing wipes when possible due to broader health and environmental concerns associated with silver compounds.^{13, 14}

Flushability and Wastewater Impacts

Wipes can create sewer blockages because many do not break down like toilet paper and can combine with fats, oils, and grease to form large obstructions. These failures can create substantial maintenance costs; in New York City between 2010 and 2015, more than \$18 million in wipe-related sewer costs was reported.¹ A wipe should only be flushed when it has been demonstrated to meet recognized flushability criteria, is labeled for toilet disposal, and is appropriate for the local wastewater or treatment system. Otherwise, it should be disposed of in the trash.¹⁵

Selection and Disposal Considerations

Topic	What to Look For	What to Avoid
Wipe material	Clearly identified fiber composition. Certified organic cotton is a good plastic-free option.	Assuming a soft, cloth-like wipe is plastic-free.
Plastic content	Wipes with no PET, polyester, polypropylene, or other plastic fibers.	Plastic-based wipes, which can persist in the environment and contribute to microplastic pollution.
Bamboo claims	Clear fiber terms such as viscose or lyocell from bamboo, or mechanically processed bamboo fiber.	Vague claims like “100% bamboo” when the actual fiber type is not identified.
Ingredients	Full ingredient and fragrance disclosure.	Relying only on claims such as “natural,” “clean,” or “non-toxic.”
Compostability	Wipes specifically labeled and verified for home composting.	Assuming “biodegradable” or “compostable” automatically means suitable for home composting. Wipes used on human or animal waste should not be home-composted.
Disposal	Follow product labeling and local wastewater guidance. When unsure, dispose of wipes in the trash.	Flushing wipes that have not met recognized flushability standards.

Table 1. Do's and don'ts of disposable wipe selection

Bamboo Labeling

Most textiles marketed as bamboo are actually rayon or viscose made from bamboo pulp. The Federal Trade Commission (FTC) notes that a product should only be described as bamboo fiber when it is made directly from mechanically processed bamboo.¹⁶

Composting

A “compostable” label does not necessarily mean that a wipe is appropriate for home composting.

The US Environmental Protection Agency (EPA) notes that disposal guidance depends on the product and how it was used, and some current EPA-approved wipe labels specifically direct consumers not to home-compost wipes used on human or animal waste.¹⁷

Visit MADEWORKS.com for disposable wipes without harmful chemicals.

MADEWORKS Intelligence (formerly MadeSafe.org) has been driving marketplace change since 2015.

We are building a bridge to a safer, more sustainable future for all. Using the MADE Ecosystem Approach, MADEWORKS Intelligence generates insights that support better product development and advance systemic change. By bringing together science, industry leadership, and informed consumer choice, we help turn meaningful information into action, transforming the marketplace for a healthier world.

MADEWORKS Intelligence is a project of Nontoxic Certified Inc., a registered 501(c)(3) nonprofit organization.

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