An Initiative of the German Federal Ministry of Education and Research

Plastics in the Environment

sources • sinks • solutions

Cigarette filters in wastewater

Plastic pollution in the environment – causes and solutions

Carelessly discarded cigarette filters in a storm drain. The filters enter the environment through storm drains and wind drift.

Photo: © FiW

„Carelessly discarded cigarette filters are an environmental problem. The existing legal framework is not sufficient in preventing it."

Dr.-Ing. Marco Breitbarth, University of Kassel

In Germany, an estimated **11 billion cigarette filters**[1] are released into the environment every year. They are mostly made of cellulose acetate, a type of plastic. Cigarette filters also contain numerous other toxins.

The European Union has therefore included cigarette filters in the Single-Use Plastics Directive. In doing so, it is placing its trust in the responsibility of manufacturers with regard to education, waste prevention and cleaning. From the scientific point of view, however, more comprehensive measures are needed.

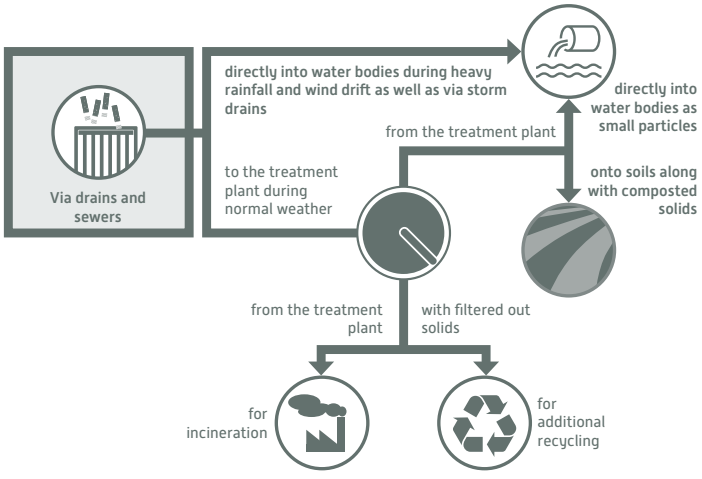
How do cigarette filters enter the environment via wastewater?

Cigarette filters are frequently disposed of outdoors where they either pollute the environment directly or end up in storm drains. From the storm drains, they are either swept directly into bodies of water along with the wastewater or into the sewage treatment plants. The wastewater treatment plant in Aachen alone receives **8 million filters** per year!

From the sewage treatment plants, filter fibers can enter water bodies directly via the effluent and can also enter fields via sewage sludge. Another problem is the direct discharge into water bodies via storm drains and, in the case of heavy rainfall, via rain overflows into retention basins past the wastewater treatment plants.

Various aspects must be taken into account when taking measures against pollution:

1. Cigarette filters are disposed of everywhere in public spaces and pollute water and soil.
2. It is not feasible to completely eliminate cigarette filters from the environment.



Improperly discarded cigarette filters can enter water bodies and soils via several pathways through wastewater.

Graphic: © Maria Daskalakis/pixabay.com

1 References: https://de.statista.com/infografik/13999/verbrauch-von-verschiedenen-plastikprodukten/

Research on the prevention of plastics entering wastewater

The interdisciplinary project „Environmental Policy Instruments to Reduce Plastic Pollution of Inland Waters via Drainage Systems“ examines and classifies the occurrence of plastic pieces of at least 1 mm in size in wastewater treatment plants and street drainage systems in the municipalities of Aachen, Roetgen, Simmerath and Stollberg. Surveys and a laboratory experiment support the analyses. Based on these findings, proposals for environmental policy instruments to prevent these plastic waste inputs are being developed.

3. Since it is usually impossible to determine who disposes of the cigarette filters in the environment, direct countermeasures are ruled out.
4. Experience shows: Providing public information to promote correct behavior, as stipulated in the Single-Use Plastics Directive, as well as financial incentives, only have a limited effect.

Effective measures against cigarette filters in the environment are necessary

The most effective approach is to switch to plastic-free cigarette filters. For this to succeed, for example, the single-use plastic directive would have to be extended to include a ban on filters containing plastics. However, this is not enough to stop the general environmental pollution caused by plastic products. What is needed is a comprehensive plastics strategy that addresses all the players involved.

Legislators	• Expanding the Single-Use Plastics Directive • Developing a program on the basic handling of plastic materials • Motivating people to refrain from smoking
Smokers	• Buying plastic-free cigarettes • Disposing correctly • Refraining from smoking
Retail	• Offering plastic-free cigarettes
Manufacturers	• Producing plastic-free cigarettes and putting them on the market • Assuming responsibility
Public Sector	• Promoting correct disposal • Preventing wastewater from entering water bodies and soils

Many players are needed to prevent environmental pollution caused by cigarette filters. Legislators must lay the groundwork.
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Ban
on cigarette filters containing plastics

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Promoting innovation and market penetration based on life cycle analysis
for plastic-free train cigarette filters

Supported by:

Monitoring the success of measures as well as damages during changeover phase.

Producer responsibility
for products, preventive measures, damage and pollution

Expanding existing regulations on information, labeling and awareness and promoting abstinence from smoking on the basis of behavioral science findings concerning in-formation processing and motivation.

Recommendations for measures against plastic pollution from cigarette filters.
Graphic: © Maria Daskalakis

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Authors
Daskalakis, Maria*; Kollmorgen, Florian*; Breitbarth, Marco*; Kerger, Sebastian**; Hentschel, Anja***; Kaser, Simon***

Institution
University of Kassel, Working Group Environmental Policy*; Research Institute for Water and Waste Management at RWTH Aachen University (FiW) e.V.**; Darmstadt University of Applied Sciences, Department of Environmental and Energy Law***.

Contact
daskalakis@uni-kassel.de

Design
Noreen Matthes, Ecologic Institute; Tanja Dohr, FiW Aachen

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