Micro plastics

Plastics are synthetic hydrocarbon polymers made from petroleum. The most used plastics polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), polyurethane (PU), polyethylene terephthalate (PET), and polystyrene (PS). Synthetic rubber (including SBR rubber granulate) also falls under this definition.

What are micro plastics?

Micro plastics are defined as synthetic, solid particles that are insoluble in water, with a size range of 1 µm to 5 mm. Micro plastics can be classified as primary or secondary plastics. This is based on whether the microscopic particles are manufactured (primary) or whether they are the result of fragmentation or decay processes (secondary).

Micro plastic in the environment

Micro plastics are poorly degradable in the environment. In addition, plastic accumulates in certain places because of rain, wind, or sea currents. It is estimated that about 3% of the produced plastic each year leaks into the environment. Due to their nature and appearance, micro plastics are difficult to remove from the environment. A lot of research is being done into the effect of micro plastics. However, the effect of micro plastics on humans and the environment is not yet clear. It is complex to research, as micro plastics are a varied group of particles whose properties can change.

Policy and legislation

The policy surrounding micro plastics focuses on decreasing the use of plastics, encouraging plastic recycling and preventing its spread in the environment. The European Chemical Agency (ECHA) has proposed to the European Commission in early 2019 to prevent the deliberate addition of micro plastics to cosmetics, detergents, paints, agricultural and industrial products.

In a new directive, the European Union prohibits member states from selling certain plastic products from 2021. These are products that are often found in the environment and for which environmentally friendly alternatives are offered on the market. In 2021, a NEN committee has started with the aim of drawing up a uniform sampling protocol, measurement method, and guidelines.

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Decision soil quality

The current policy is aimed to further prevent the spread of macro- and micro plastics in the environment. Foreign material, such as plastics, may only be present sporadically.

Analysis options Eurofins

Within Eurofins, there are various options for analyzing micro plastics. The analyses can be performed on the matrices soil, water, and compost. The possibilities differ per matrix.

Below, the available methods are explained in more detail. Additionally, the next page contains a clear table of practical information.

Pyrolysis GCMS

Pyrolysis – gas chromatography – mass spectrometry is a method is a method in which a sample is heated by pyrolysis to such an extent that a particle breaks down into small molecules. Specific degradation products are quantified by gas chromatography and mass spectrometry and traced back to the type of plastic material.

- Reporting in µg/kg ds (or µg/L) of 8 individual polymers and the summation of these polymers: ABS, PE, PP, PS, PVC, PET, PC, PMMA, PA66 and PA6.
- Rubber particles >27 um can also be determined in µg/kg ds. Here, the polymers Polybutadiene, Polyisoprene and Styrene-butadiene rubber are analysed.

TED-GCMS

In Thermal Extraction and Desorption – gas chromatography – mass spectrometry, plastic particles are also thermally broken down at high temperature.

The degradation products are adsorbed on adsorbent material and subsequently thermally released in a controlled manner for quantification of gas chromatography and mass spectrometry. Based on the specific degradation products, plastic types are identified.

- Report in µg/kg dw (or µg/L) of 8 individual polymers and the summation of these polymers: PE, PP, PS, PVC, PET, PU, PAN, PA6.

About Eurofins Environment Testing

Eurofins Environment Testing Netherlands is part of Eurofins Scientific and your partner for environmental testing. Our goal is to help you achieve your objectives. With efficient and qualitative analysis techniques we support your business processes. Our customer service is at your disposal with specialized knowledge and extensive experience. You can make use of our own packaging and logistics service. Our reliable couriers take care of sample transfer on site and transport the samples to the relevant laboratory the same day.

Eurofins Environment Testing Netherlands is committed to protecting the environment. With our products and services, we support the responsible use and minimization of substances harmful to humans and the planet. Examples include hormones, pesticides, dioxins and heavy metals. By reducing the usage of water, raw materials and energy, we contribute to sustainability. Our laboratories have developed special programs to minimize environmental risks, such a safe use of chemicals and waste disposal.

FTIR

To use the FTIR method, soil and water samples must first be filtered and pretreated. Microplastic particles are then identified using FTIR spectroscopy via their vibrational spectrum. This spectrum is unique to each type of polymer and is used to create a viualization of the distribution of the microplastics.

More information

Eurofins can assist with the analysis of micro plastics in various matrices. For additional information regarding analyses, (example) reports, rates, delivery times, service and more, please contact the designated contact person or send a mail to info-env@eurofins.com.

Practical information

Method	Matrix	Packaging	Amount of material	Partical size	Report	Delivery time
FTIR	Water	Bottle (065) aluminum foil covering under the cap	1 - 5 L	10-5000 µm	- 30 polymers - number of particles - particle size-distribution	21 working days
	Ground	Jar (053) aluminum foil covering under the cap	200 - 400 gr	10-5000 µm	- 30 polymers - number of particles - particle size-distribution	21 working days
Pyrolysis GCMS	Soil	Jar (053)	100 - 500 gr	27 µm - 1000* µm	10 polymers in µg/L Optional: 3 rubbers	21 - 28 working days
	Groundwater	Bottle (065)	2 L	10 µm - 1000* µm	10 polymers in µg/L Optional: 3 rubbers	21 working days
	Wastewater	Bottle (065)	2 L	10 µm - 1000* µm	10 polymers in µg/L Optional: 3 rubbers	28 working days

* In consultation, values between 1000* µm and 5000* µm can be included in the analysis.