

Microplastic detection and identification

Generally, microplastics refers to small, usually microscopic, solid particles made of a synthetic polymer. They are associated with long-term persistence in the environment, if released, as they are very resistant to (bio)degradation.

Proposal for a regulatory definition of a microplastic under REACH

On 30 August 2022, the **European Commission published its proposal to restrict** the placing on the market of microplastics, increasing the size of particles covered and allowing a transition period of up to 12 years for certain products. The restriction **will be adopted under the REACH Regulation**, which establishes the EU chemicals framework.

The European Commission has published its long-awaited proposal with some changes and clarifications to ECHA's original proposal. The **main points proposed** are:

- redefinition of the size of microplastics: increase from 1 nm to 0.1 µm for particles, and from 3 nm to 0.3 µm for fibre-like particles;
- definition of different transition periods to the application of the restriction between 4 and 12 years depending on the product;
- exclusion from the restriction definition of microplastics in certain products, such as medicines, fertilisers, food additives and in vitro diagnostic devices;
- introduction of mandatory information requirements - e.g. on labels or packaging - for products containing microplastics;
- introduction of criteria for permitted test methods to identify degradable particles in order to exclude them from the application of the restriction.

Primary microplastics intentionally added

are industrially manufactured for specific purposes in the form of synthetically based granulates and pellets. Different plastics such as polyethylene (PE), polypropylene (PP), polystyrene (PS), polyethylene terephthalate (PET), polyvinyl chloride (PVC), polyamide (nylon) and ethylene vinyl acetate (EVA) are used.

Secondary microplastics unintentionally added

occur through chemical and physical ageing and degradation processes of products such as plastic bags, plastic bottles or tyre wear particles. As far as we know, the microplastics found in the environment mainly consist of secondary microplastics.

Regulatory items

In line with REACH procedures for restricting substances that pose a risk to the environment or human health, the 20th March 2019 the Commission **requested ECHA** to assess the scientific evidence for taking regulatory action at EU level on microplastics that are intentionally added to products of any kind.

If adopted, this restriction could reduce the amount of microplastics released to the environment in the EU by about 400 thousand tonnes over 20 years.

The vast array of different plastic types available on today's consumer market makes the qualitative or quantitative analysis of microplastics extremely challenging and there are currently no officially recognized methods available.

Thanks to the long standing experience of ECSIN laboratories (European Center for the Sustainable Impact of Nanotechnology), it has been possible to develop and validate specific methods that can be applied to diverse matrix types including detergents, cosmetics, drinking water, milk, beverages, mineral salts, fish products and environmental matrices.

Our capabilities for microplastic detection and identification

Microplastics identification requires:

- Particle size determination (<5 mm)
- Chemical identification (i.e. Plastic composition)

Microplastics detection methods:


- Fluorescence microscopy
- FT-IR microscopy
- RAMAN microscopy
- SEM/TEM-EDX


The procedure for microplastic detection and identification


1. **Sample preparation:** degradation of the organic matrix in order to isolate microplastics
2. **Filtration** in cleanroom ISO 7 class
3. **µFTIR / chemical imaging: visual image of components distribution** from simultaneous chemical identification and particle size detection

Validated procedures for

Detergents 

Cosmetics 

Waste water
Fresh water
Sea water
Sludge
Soils 
Digestate

Salt 
Drinking Water
Milk
Soft drinks
Mollusks
Fish
Grocery and/or
consumer goods

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BASED IN ITALY, ECSIN LAB - PART OF MÉRIEUX NUTRISCIENCES GROUP - IS AN INNOVATION LAB THAT COMBINES THE ATTENTION TOWARD THE EFFICACY OF THE PROPOSED SOLUTIONS WITH THE PARTICIPATION IN INTERNATIONAL SCIENTIFIC STRATEGIC PROJECTS FOR THE FUTURE.



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