Because you care
about CONSUMERS' HEALTH

MERIEUX NutriSciences

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
Microplastics refers to a material consisting of solid polymer-containing particles, to which additives or other substances may have been added, and where ≥ 1% w/w of particles have (i) all dimensions 1nm ≤ x ≤ 5mm, or (ii), for fibres, a length of 3nm ≤ x ≤ 15mm and length to diameter ratio of >3. Polymers that occur in nature that have not been chemically modified (other than by hydrolysis) are excluded, as are polymers that are (bio)degradable.

In April 2019, a Group of Chief Scientific Advisors has published the document **Environmental and Health Risks of Microplastic Pollution** where microplastics are considered to **be solid synthetic-polymer-containing particles of no more than five millimetres in their longest dimension (i.e. Φ ≤ 5 mm) and which may contain additives or other substances**.

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

MÉRIEUX NUTRISCIENCES OFFERS ITS SCIENTIFIC EXCELLENCE IN PHARMACEUTICAL, CHEMICAL, BIOCIDE, COSMETIC AND FOOD PRODUCTS TESTING AND CONSULTING TO ENSURE SUPPORT, OPTIMAL REACTIVITY AND FLEXIBILITY TO ITS CUSTOMERS ALL OVER THE WORLD.

ECAMRICERT-ECSIN, A MÉRIEUX NUTRISCIENCES COMPANY, IS A RESEARCH CENTRE DEDICATED TO THE SUPPORT AND PROMOTION OF SUSTAINABLE DEVELOPMENT OF NANOTECHNOLOGIES. IT COMBINES THE ATTENTION TOWARD THE EFFICACY OF THE PROPOSED TECHNOLOGICAL SOLUTIONS WITH THE ATTENTION TO THEIR SAFETY TOWARD HUMAN AND ENVIRONMENTAL HEALTH. ECSIN REPRESENTS A UNIQUE COMPETENCE CENTRE SUPPORTING NATIONAL AND INTERNATIONAL INNOVATIVE INDUSTRIES.

Mérieux NutriSciences
Via Fratta 25, 31023 Resana (TV)
phone +39 0423 7177 e-mail gxp.italy@mxns.com
www.merieuxnutrisciences.com/eu

Follow us on Linkedin to be updated on our services and news
Follow us on Linkedin - Mérieux NutriSciences - Italia

BR2119_0_ENG / Photos: Shutterstock. Printed in Italy

MERIEUX NutriSciences

Ecam Ricert Innovation in research

ecsin european center for the sustainable impact of nanotechnology