Edwin Tafelmeier,
Laboratory Manager

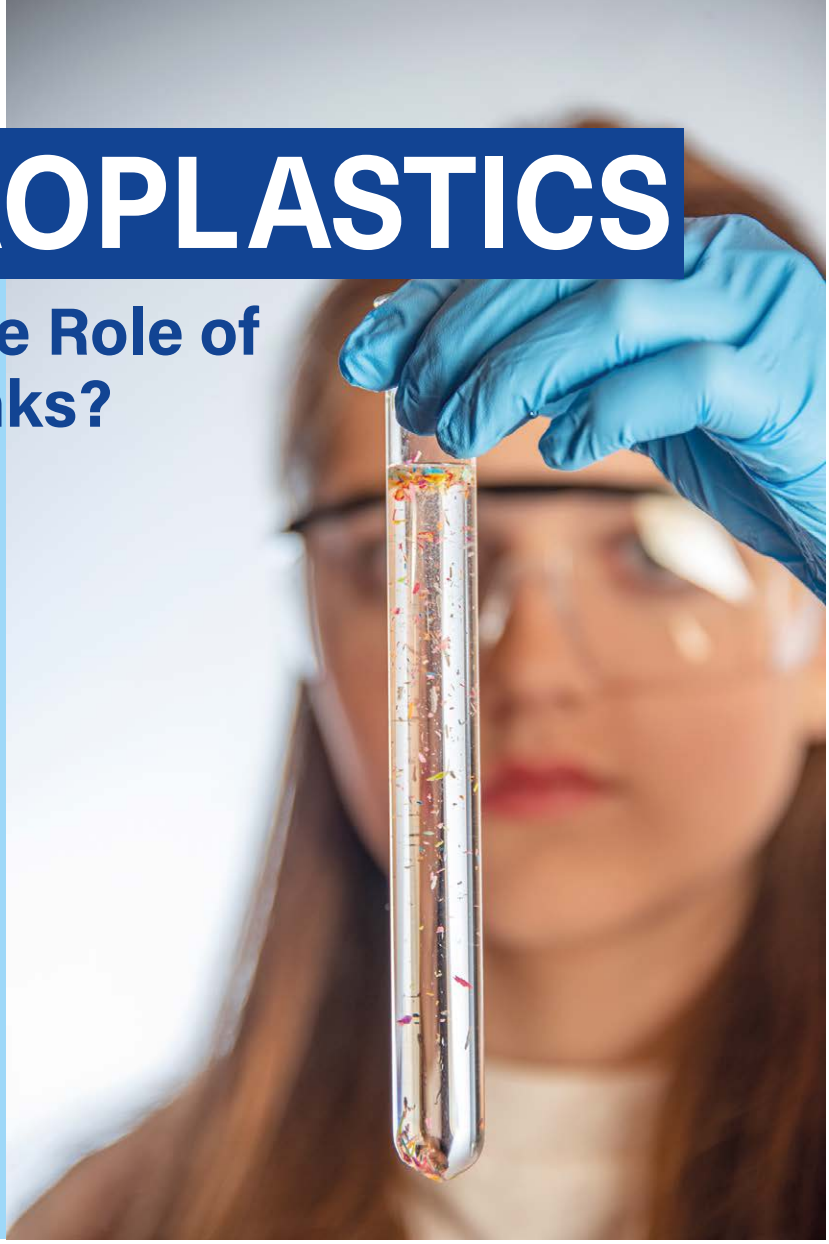
# MICROPLASTICS

## What is the Role of Printing Inks?

**The term microplastics also applies to polymers used in the production of printing inks and varnishes.**

**Our inks and varnishes are liquid products containing binders which form a solid ink film after drying or curing. Even if the formulation contains micronized polymers this ink film will not meet any criteria to be classified as microplastics.**

**Pigments, fillers, or any additive in powder form are completely integrated in the ink film matrix and form a solid, homogenous layer.**



Laboratory examination of microplastics – test tube with water sample

In the inks industry deliberately produced primary microplastics are used as raw material. If handled properly and carefully it is extremely unlikely that these microplastics are unintentionally released to the environment.

However, during the lifetime of plastic parts microplastics are produced by mechanical wear and tear. This cannot be avoided completely, though it is quite possible to reduce this effect.

Secondary microplastics are created by weathering and fragmentation of plastic waste, depending on definition also by mechanical abrasion (or grinding).
Plastic waste has no business at all in our environment! Proper disposal of plastic waste is important to avoid potential environmental problems.

### INKS AND VARNISHES ONLY PLAY A MINOR ROLE IN THE RELEASE OF MICROPLASTICS

According to various studies in 2018, each year an estimated amount of 330,000 tons (or considerably more) of microplastics are released into the environment in Germany. The main sources for that release are abrasion of tires, washing of synthetic textiles, pellet losses and drifts from artificial lawns.
Release of microplastics from paints, inks and varnishes as a whole is on eleventh place. The share coming from printing inks most likely only accounts for a small fraction.

The binders from paints, inks and varnishes subjected to outdoor weathering are partially chemically decomposed to carbon dioxide, water, or nitrogen by photochemical and hydrolytic processes. Then pigments and fillers are no longer completely integrated in the film

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matrix so that the particles released by weathering will end up in the environment or sewer system when it rains.

Wastewater treatment plants in Germany are quite effective, up to 99% of the microplastics contained in wastewater are bound in sewage sludge. This aspect would also be interesting, for example, in the discussion of microplastics in cosmetics. As the above examples show, compared to other sources, screen and pad printing inks, as well as the objects printed with them, are unlikely to have any significant potential for releasing microplastics into the environment. However, it is essential that all printed items are disposed of properly at the end of their service life.

## ARE MICROPLASTICS HARMFUL TO HEALTH?

You cannot exclude a small amount of abrasion in form of microplastics during the daily use of plastics and printed objects. The magazine „Wir sind Farbe“, published by VdL *), 18th edition published in October 2022, summarizes this issue as follows:

"Risk assessments by international scientific institutions, albeit based on limited data, have concluded that human exposure to microplastics or chemicals associated with microplastics is not harmful to health (WHO, 2019)".

Accordingly, currently there is no clear evidence that microplastics are harmful to health, but on the other hand, it is quite clear that further research is required. We will continue to monitor any developments. Should any new results come up we will take measures to minimise the risks if necessary.

## HOW CAN THE EMISSION OF SECONDARY MICROPLASTICS BE REDUCED?

The starting material for microplastics is plastics in general. If these micronized polymers are present in solid particle form, are neither water-soluble nor biodegradable, they meet the ECHA definition of microplastics. If they are released to the environment, they usually bind to other particles through aggregation, and are therefore no longer micro- or nanoparticles.

These aggregates can ultimately find their way to living organisms by ingestion or the food chain in general. There they either accumulate, metabolize or ideally, they are completely excreted. At present plastics can only partially be recycled. Processes such as pyrolytic conversion into fuels are available to make use of the remaining plastic waste.

Once plastic waste is considered to be a valuable raw material, there is little likelihood of such waste intentionally ending up in our environment.

Technologies are available, they just need to be applied. In our modern world, plastics are an indispensable material.
Progress means to take better and more responsible advantage of feasible technical possibilities in the future.

Sea sand contaminated with microplastic waste