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Assessment and adjustment of the aging and degradation behavior of plastics

Everything under control!

Agricultural film - typical example of a plastic in the environment

How do plastics degrade in soil, water or air? What needs to be considered when designing products made from biodegradable plastics? We provide the answers by investigating and evaluating the changes in properties of plastics during aging due to environmental influences.

Plastics enter the environment either in a planned manner, as in the case of agricultural films or geotextiles, or unplanned, as in the case of littering. As consumers become increasingly aware of the environmental impact of plastics and their accumulation in ecosystems, there is a growing interest in biodegradable plastics. But how do these plastics behave in the environment?

During their life cycle a biodegradable plastic product goes through various phases. Beginning with the use phase, when the product is fully functional, the physicochemical properties of the plastic are reduced by biological and chemical processes that lead to visible fragmentation and ultimately to the metabolization of the plastic.

Industries

- Plastics processing industry
- Textile industry
- Agriculture and forestry
- Gardening and landscaping
- Construction industry

Left: PLA test bars in compost
Middle: Aged mulch film
Right: Sample holder in fresh-water test rig

Technological specifications

Fragmentation of products such as films, injection molded components or (textile) filaments is simulated in our laboratory under controlled conditions, whereby the conditions are set as close to the application as possible:

- different substrates (compost, soil, fresh water)
- temperature range 20 to 60 °C
- controlled soil moisture
- use of UV radiation for investigating of the influence of sunlight

Various analytical methods are used to assess aging, such as the documentation of optical changes by means of microscope images or the determination of physical and chemical properties of the polymer.

In addition to degradation and aging we conduct standardized biodegradability tests according to DIN EN 13432, DIN EN 14995 and ASTM 6400 as part of our certified test laboratory.

Our service

- Carrying out degradation and aging tests
- Studies on the biodegradability of materials
- Simulation of realistic environmental conditions
- Testing of different materials and sample geometries
- Accompanying analysis
- Material optimization to adjust biodegradability
- Approved testing laboratory of the Bundesgütegemeinschaft Kompost
- Approved testing laboratory of DIN CERTCO and BPI for studies on the composability of materials

Your benefit

For plastic products that are placed into the environment, it is important to know how environmental influences affect the material properties and what degradation processes can be expected over time. You can use this knowledge to optimize your plastic formulations for specific applications and to adapt them to the intended life cycle.

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