

Projekttitel: BioTurf - Neuartige nachhaltige Kunstrasensysteme aus biobasierten Polymeren

Partner: TFI - Institut für Bodensysteme an der RWTH Aachen e. V., MET - Morton Extrusionstechnik GmbH

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Mission Statement

With the aim of saving maintenance costs, artificial turf systems are increasingly being used in the construction of new sports surfaces. Compared to natural grass, these offer a low-maintenance, weed-free and weather-independent surface that does not need to be watered or fertilised. By 2020, it is estimated that there will be over 90,000 (approx. 260 million m²) artificial turf pitches in Europe, most of which will be used for football. A artificial turf field is a multi-layered structure made up of various components. The sub-base (subsoil, base layer without binder, possibly asphalt layer) is followed by an elastic layer or a bonded elastic base layer. This is followed by a stabilising backing layer. On top of this is the actual artificial turf. This consists of filament yarns tufted into a textile carrier. The fibre layer is often additionally filled with sand and rubber granulate.

The different raw materials and polymers in the pile and carrier layers as well as the infill make material recycling difficult. With regard to the elastic filler, a loss and thus a refill requirement of 70 g/m² (500 kg/field) is expected per year. This also corresponds to the amount that is potentially introduced into the environment as microplastics.

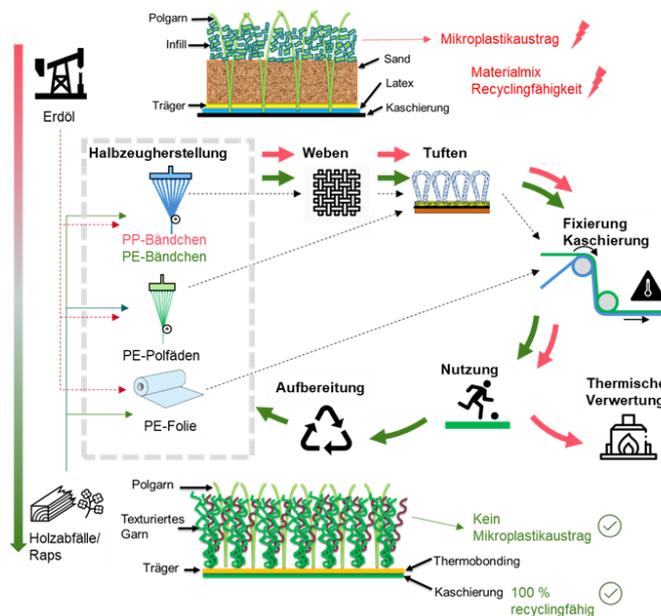
The aim of the "BioTurf" project is therefore to develop an artificial turf structure made of bio-polyethylene (PE) as a polymer raw material. The mono-material structure creates the possibility for high-quality material recycling with regard to a closed-loop economy. In addition, the artificial turf should manage without the addition of infill granulate, i.e. it should have a so-called non-infill structure and thus minimise the input of microplastics into the environment (currently approx. 500 kg/pitch and year).

Approach

The various layers of artificial turf are replaced by Bio-PE. The following steps are necessary for this:

- Development of monofilaments for the pile wear layer made of bio-based PE.
- Production of film tapes from bio-based PE
- Production of carrier fabric structures from the film tapes
- Development of novel tufting structures
- Thermobonding/coating from 100% recycled PE

Bio-PE is the ideal raw material for this purpose, as it differs little chemically from crude oil-based PE. Due to the mono-material concept and the omission of infill granulate, the recyclability is drastically increased in contrast to the previous thermal recycling. In the course of the project, two playable large-scale demonstrators will be manufactured for test purposes as real labs, designed and exemplarily recycled after use in order to run through the process chain in the sense of the circular economy



Acknowledgment



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