

# Kurzstudie

## Analyse von Kunststoffgranulat aus Altreifen (SBR) für die Verwendung als Einstreumaterial auf Kunstrasenfeldern

**Auftraggeber:**

KIAS Recycling GmbH  
Unterthalham Straße 2  
A-4694 Ohlsdorf



**Vorgelegt von:**

Univ.-Prof. Dipl.-Ing. Dr.mont. Roland Pomberger  
Dipl.-Ing. Tudor Dobra

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## Executive Summary

### Introduction

Artificial turf fields have a lot of advantages in comparison to natural grass fields. This includes a higher usage capacity (hours per year), less water use, better weather resistance and a lower need for maintenance. These characteristics allow the installation of artificial turf fields in nearly all regions, regardless of climate conditions, soil/underground and surroundings. Therefore, such fields increase the opportunities for people to be active. An important component of artificial turf fields is the so called infill material. The company KIAS Recycling produces SBR-granulate from EOL-tyres, which is subsequently used for this purpose. Over the last years several negative reports have been published in relation to SBR-granulate. This study aims at presenting existing information on the topics PAH/health and microplastics.

### PAH/Health

Currently in Austria 20 mg PAH per kg SBR-granulate is the guideline value according to the ÖISS-guideline "Kunststoffrasenbeläge: Eigenschaften, Aufbau, Prüfung". In 2018 the Netherlands have submitted a restriction proposal which would introduce 17 mg/kg as an EU-wide limit value. Every batch of granulate produced by KIAS Recycling is subjected to tests regarding the PAH concentration by the Austrian Federal Environment Agency. All samples that have been submitted, have been below both of the limit values (20 and 17 mg/kg). The mean value (in the timeframe April 2017 to June 2019) has been 8.09 mg/kg.

Besides PAHs, several other ingredients of the SBR-granulate have been identified as a potential health risk. This includes metals (e.g. Cadmium), phthalates, phenols and PCBs. On the basis of multiple studies on this topic, the following statements regarding health risk in relation to SBR-granulate can be made:

- The risk of cancer for players and workers is very low when a maximum concentration of 20 mg/kg PAHs is not exceeded.
- The risk for players and workers which is caused by metals in SBR-granulate is negligible.
- All other studied ingredients do not cause a health risk for players and workers.

### Microplastics

In the restriction proposal published in March 2019 by the European Chemical Agency (ECHA), microplastics are defined as materials containing more than one weight percent of particles in the size range of 1 nm to 5 mm. This proposal stipulates a ban on intentionally added microplastics – this also includes infill material for artificial turf fields. The main argument for this is the transfer of those particles into the environment (water bodies and agricultural land). These processes are however varying a lot on a regional level and are dependent of the existing infrastructure, the climate conditions as well as the topographic

situation. The existing data in this field is currently not complete and subject to high uncertainties. Therefore, it has to be critically questioned.

For the assessment of the transfer of microplastics into the environment, it is important to study the actual transport paths and mechanisms. The mere occurrence of material classified as microplastics in a system (e.g. SBG-granulate in an artificial turf field) is not detrimental to the environment per se. The actual amount that is released to the environment through different channels should be seen as the basis for evaluations in this regard. The loss of granulate per field is usually not measured directly, but rather extrapolated from the amount of infill material that is used every year for refilling purposes. Austrian stakeholders report an amount of about 1 tonne per year. Several European studies set this value at 1 to 4 % of the whole infill material. A certain amount of this apparently lost material is in fact however not really lost but has been subjected to compaction on the field itself. Regarding the amount that actually leaves the field, only a small amount reaches water bodies. The rest stays in surrounding areas, is transferred into the waste management system or is retained in sewage treatment plants. There are no precise numbers available for Austria regarding this topic. First estimations put the amount of granulate transferred into water bodies at 1.125 to 16.36 kg per year for each field. This corresponds to 0.11 – 1.64 % in relation to the yearly refill amount. Several technical/structural measures are available for the retention of granulate on the field and the surrounding areas. ECHA is currently investigating whether such measures could be an alternative to a total ban.

The comparison with other sources of microplastics show that nearly all references name tyre abrasion as the main source. Also important are loss of pellets (during polymer production), fibre abrasion of clothes during washing, abrasion of road markings and losses during waste treatment. In general it would be important to garner reliable data regarding microplastics and their transport into the environment. This would allow the fair comparison between the different sources and therefore also the identification of areas with the highest need for action.

### **Alternative Infills**

Alternatives to SBR-granulate are available on the market. A distinction between polymer-based solutions (TPE, EPDM, Nike Grind) and natural materials (silica sand, organic materials) can be made. The first group would also be included in the planned ban on microplastics. In general all materials have certain positive aspects as well as several drawbacks. Especially the missing long time experience (regarding the technical aspects) as well as uncertainties regarding the availability of the alternative materials lead to the conclusion that there is no adequate substitution available which could replace SBR-granulate on a large scale.