Environmental Compatibility – Recent Developments

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Introduction

Important criterias for the use of synthetic turf areas are

- Appropriate **material and technical properties** to ensure the required safety and sportfunctions
- The **environmental compatilibity** during and also after the use

Environmental and health aspects

- The possible contamination of **soil and groundwater** by leaching of soluble pollutants out of the synthetic turf areas
- Health hazard for **residents and users of sport areas** because of the release of gases and dangerous particles
- The possible release of pollutants during **disposal**, e.g. during incineration

Requirements for environmental compatibility

- A basic requirement is **legal compliance** with **national and international** laws during and after the intended use of the synthetic turf.

- On top of it **no negative impact** on soil, groundwater and air should be given at all.

National requirements

- In Austria the following directives have to be met:
  - Grundwasserschwellenwertverordnung BGBl 213/1997 (Ground Water Treshold Value Directive)
  - BGBl. 613/1992: Verordnung zur Begrenzung betreffend Sickerwasseremissionen aus Abfalldeponien (Directive for Limitation of Percolating Water Emissions from Landfills)
  - BGBl. 186/1996: Allgemeine Begrenzung von Abwasseremissionen in Fließgewässern und öffentliche Kanalisation (General Limitation of Waste Water Emmission to Stream and Public Sewers).

Technical guidelines

For the assessment of possible environmental impacts in Germany, Switzerland and Austria the following technical guidelines have been established within the last years:

- **DIN V 18035-7**: “Sports grounds – Part 7: Synthetic turf areas”, 06:2002
- **ESSM Guideline** “Sport grounds, Guideline for Environmental Compatibility of Elastics Synthetic Coverings on open air Sports Grounds”, 1997:03
- **OISS Guideline** Requirements on Synthetic turf areas, actual version 2005:01

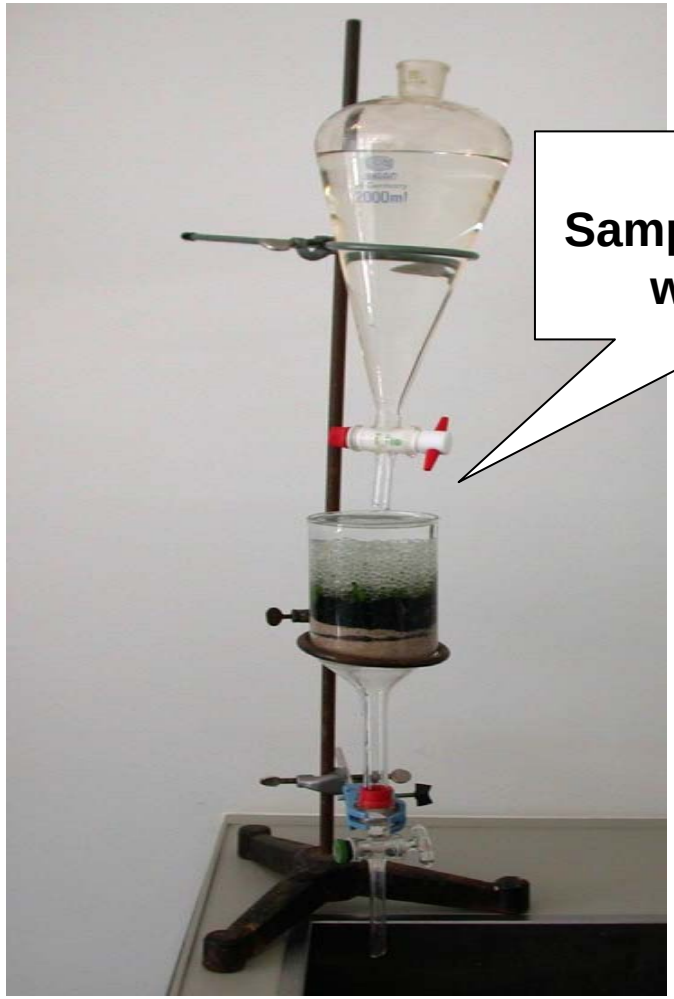
Technical guidelines

All guidelines include the analysis of **extracts from the individual system compounds**.

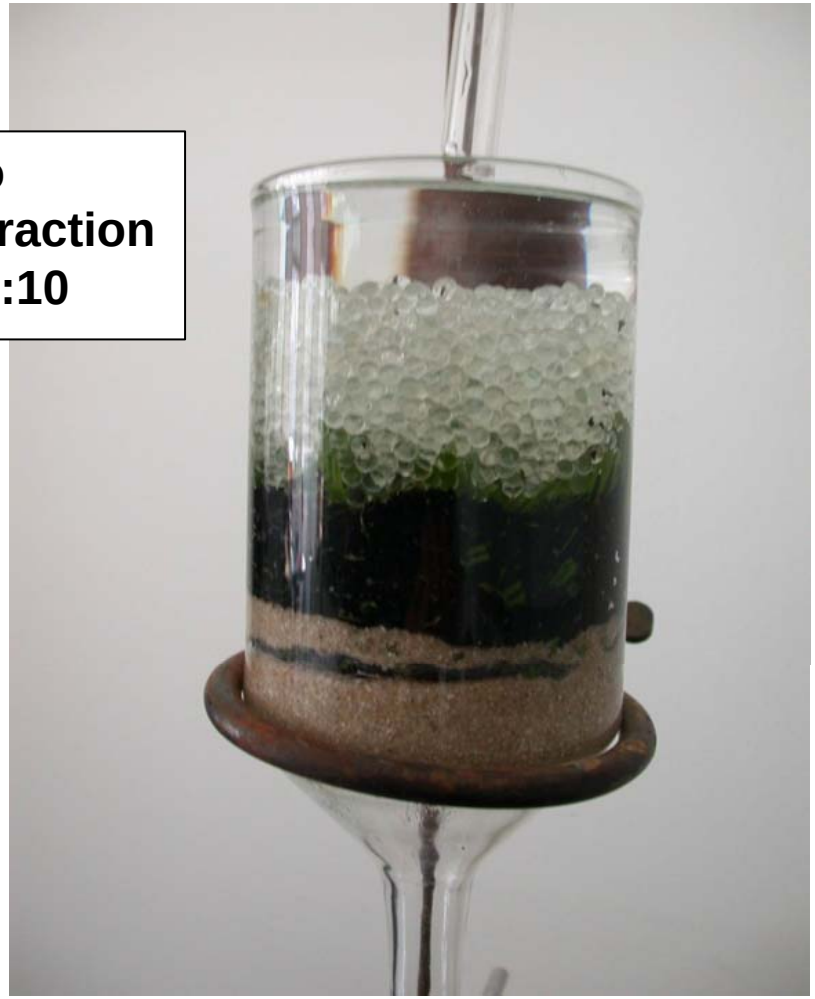
The given treshold values have to be applied to **the 2nd 24 hour extract** of the questioned material.

According to the Austrian ÖISS guideline an examination of the **whole synthetic turf system** is also permittable (**Austrian percolating test**). It may be performed alternatively if the indiviual system compounds fail the criterias.
In the case of the percolation test the extraction period is only 2 times 12 hours.

Austrian percolating test



Ratio Sample:Extraction water=1:10



Comparison of requirements

Parameter	DIN	ESSM:1997	OISS
DOC	≤ 20 mg/l	≤ 15 mg/l	≤ 20 mg/l
EOX	≤ 100 mg/l		≤ 100 mg/l
PAH			≤ 0,002 mg/l
Lead	≤ 0,04 mg/l	≤ 0,05 mg/l	≤ 0,03 mg/l
Cadmium	≤ 0,005 mg/l	≤ 0,005 mg/l	≤ 0,003 mg/l
Chrom total	≤ 0,05 mg/l	≤ 0,05 mg/l	≤ 0,03 mg/l
Chrom VI	≤ 0,008 mg/l		≤ 0,008 mg/l
Mercury	≤ 0,001 mg/l	≤ 1 mg/kg	≤ 0,001 mg/l
Zinc	≤ 3,0 /≤ 0,5 mg/l	≤ 0,2 mg/l	≤ 0,5 mg/l
Tin	≤ 0,05 mg/l	≤ 0,5 mg/l	≤ 0,05 mg/l
Toxicity	≤50% resp. Non	≤50% (80%Eluat)	LID (G_L) ≤ 4
Biological degrad.	If necessary		If necessary
Odor	descripton		description
External nature	descripton		description
Surface Tension		>55 dyn/cm	

Recent discussion points

The German; Swiss and Austrian requirements are quite similar but also **differ in some important points**:

- **Heavy metals** e**xtraction method** : carbondioxide saturated water versus the use of normal water (water quality)
- **Toxicity tests:** DIN and ESSM allow an inhibition of nitrification of maximum 50%, excepting elastic fillers in Germany (no regulations!). The ÖISS guideline requires the determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent Bacteria test). The LID (lowest ineffective dilution) is not allowed to be higher than 4 (equals 25% v/v).

Recent discussion points

- Use of **recycling material** for elastic infillers with high variation in quality. ÖISS permits the use of these materials, but measures for quality assurance have to be proven. The conformity of the actually used materials to the requirements of the initial laboratory performance test has to be proven.
- How **suitable** are the existing test procedures ?
- What are the **real environmental impacts** of synthetic turf areas during their use?
- Recycling aspects