



European Synthetic
Turf Organisation

Minimising the risk of micro-plastic pollution
ESTO Guidance Document

Minimising the risk of synthetic turf surfacing being a source of micro-plastic pollution

Synthetic turf surfaces used for sports, recreational or landscaping applications provide an attractive, hard-wearing, low maintenance surfacing solution for many situations where natural turf alternatives are not cost-effective, feasible or sustainable.

But, as with any man-made product, a synthetic turf surface needs to be installed, maintained and finally disposed of in a way that minimises its impact on the environment. The synthetic turf industry is committing significant resources to developing sustainable surfaces that will enable a cradle to cradle approach to the manufacturing and recycling of the surfaces. During the use of the surfaces, however, it is the owner or operator of the synthetic turf surface that has a key role to play in ensuring the surfaces do not adversely affect the environment.

Media and public attention has rightly highlighted the terrible damage irresponsibly discarded plastics, and especially micro-plastics, can have on the planet and more specifically the pollution of the marine environment. Some have suggested that the rubber infill used in some forms of synthetic turf surfaces may be a potential source of such pollution, others have suggested fibre wear from the pile of the synthetic turf carpets might also be another possible source of environmental pollution.

There is a wide range of synthetic turf surfaces, some have an infill within the pile of the surface, others do not. The infill may comprise natural materials such as sand or cork or be a made from rubber or other forms of polymer. ESTO and its members recognise that they have a responsibility

to ensure the products they supply are used and maintained responsibly so their impact on the environment are negligible.

Most synthetic turf football and rugby surfaces (often described as third-generation synthetic turf sports surfaces) contain granular rubber infill within the pile of the synthetic turf carpet; it is a key component of the surface and allows it to perform in a way that the players desire. The infill is designed to be retained within the pile of the carpet, but some localised movement within the field and potentially onto the surrounds can be expected. Experience shows a combination of good infra-structure design and suitable routine maintenance can minimise the effects of such infill movement.





The depth of the infill within the synthetic turf carpet pile is carefully determined by the manufacturer of the sports surface. This normally allows about 15 - 20mm of the carpet pile to protrude above the infill. In this condition most of the infill will be contained by the pile and movement and migration is minimal. During prolonged use, with inadequate maintenance, the infill can, however, be dispersed from higher use areas of a field to the margins and it is very important, (not least to ensure good sports performance and player safety is maintained) that this dispersed infill is regularly returned to the higher use areas of the field. This is easily achieved through regular brushing and drag matting of the field.

Unfortunately, inadequate knowledge or poor maintenance can sometimes result in surfaces being over-filled, especially as they become older. This is often done in an attempt to extend the life of the surface. Overfilling will increase the potential of infill migration and is not something ESTO advocates.

The risk of some infill migrating to the areas surrounding a 3G field cannot be discounted, but there are design solutions that can be used to minimise the risk and ESTO recommends their inclusion in all new fields; noting that the selection of synthetic turf and infill solutions needs to still ensure a field satisfies the sports performance requirements of the players and venue operators. Examples of good practice are given below, but there are other suitable solutions available on the market that are also worthy of consideration:

- Use of raised perimeter edge details
- Use of entrance mats and metal foot-grills to capture infill be walked off a field
- Use of slit traps or special filter areas in the drainage devices around the boundaries of fields and in changing rooms, etc.
- Use of synthetic turf systems that either have a lower potential for infill movement through the use of yarn profiles and stitch rates that are designed to restrict infill movement and or the use of synthetic turf systems that require less infill
- Use of infills that are less prone to movement and migration

Possibly the biggest source of infill dispersion is when fields are cleared of snow. Ideally the snow layer should be cleared so around 5 – 10mm remains and is allowed to thaw naturally, but in many colder climates this is not possible, so all the snow is removed, and this will inevitably result in some infill also being removed. ESTO recommends that snow removed from 3G pitches should be stored alongside the run-offs to the pitch or on suitable hard paving adjacent to the field, that is designed to ensure that snow-melt drains in a controlled manner to drains that have suitable silt traps to capture any infill being washed away.

¹ 3G or third generation is the term that has adopted within the synthetic turf industry to describe long pile synthetic turf sports surfaces that have a granular infill. It is used to distinguish these surfaces from the short pile non-filled and sand filled surfaces, that preceded the development of 3G surfaces.



Figure 2 - snow being stored on the side of a synthetic turf field to ensure infill does not contaminate the surrounding environment.

As the snow melts most of the infill will be deposited on the storage area and it should be collected, filtered to clean if needed, and then reintroduced into the synthetic turf surface to ensure the infill levels remain at the design depth. ESTO believe that under no circumstances should snow removed from a synthetic turf field be deposited into water courses as this can lead to aquatic pollution and advises that snow really should also not be deposited on soft landscaping where containment by the infill cannot be controlled.

Although fibre wear has not been shown to be a source of micro-plastic pollution ESTO wishes to ensure it does not become one. Improvements in yarn technology mean that the piles of good quality synthetic turf surfaces are now very durable and fibre splitting and loss is much less than seen on earlier forms. All synthetic turf fields

should be brushed regularly to retain optimum playing conditions and remove detritus. Ideally such brushing will be undertaken by a specialist brush that ensures any detritus is captured, allowing it to be safely collected and disposed of in a responsible manner.



Figure 3 - brushing of a synthetic turf field with specialist equipment that captures any debris or detritus found on the field.

For further information on anything to do with synthetic turf surfaces please visit the ESTO website at www.theesto.com or contact ESTO at info@theesto.com.

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