European Chemicals Agency
Annankatu 18
P.O. Box 400
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FINLAND

17th May 2019

Dear Sirs

Public consultation on Annex XV restriction report - proposal for a restriction on intentionally added microplastics

ESTC is the EMEA Synthetic Turf Council, a non-profit trade association representing European, Middle East and African based companies manufacturing synthetic turf surfaces and the components used to form the surfaces and also companies that install and maintain synthetic turf surfaces. Members also include sports federations that use synthetic turf surfaces. At present ESTC has over 80 members and further details may be found at https://www.estc.info. ESTC works closely with the Synthetic Turf Council (STC) a trade body that undertake a similar role to ESTC in the North American market. This letter, prepared by ESTC, is endorsed by the STC.

This letter details ESTC's initial response to the *Annex XV restriction report - proposal for a restriction on intentionally added microplastics*. In conjunction with our members we are currently collecting further information and propose to make a further submission to ECHA during the consultation period.

Synthetic turf surfaces used for sports, recreational or landscaping applications provide an attractive, hard-wearing, safe, low maintenance surfacing solution for many situations where natural turf alternatives are not cost-effective, feasible or sustainable. ESTC recognises that 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. We agree that the potential effect of intentionally added microplastics on the environment poses a legitimate concern and call for control measures that have a clear scope, based on the latest scientific evidence on the hazards and risks associated with infills used in synthetic turf surfaces and brings the most benefit to environmental protection.

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. Figure 1 shows a cross section of a typical third-generation synthetic turf surface.

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. ESTC and its members are actively developing means of minimising the potential for infill to be carried outside the boundaries of the field.

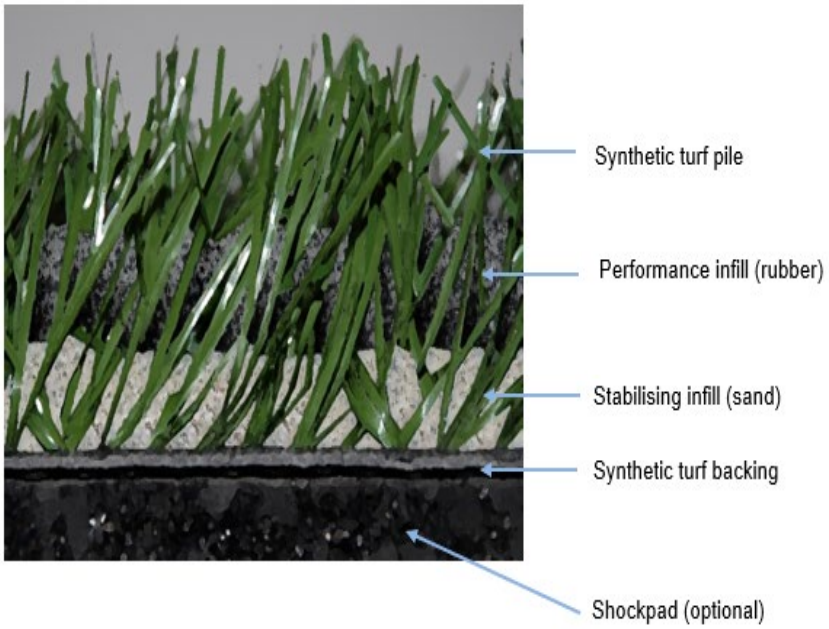

Figure 1 cross section of 3rd generation synthetic turf surface

The performance infill provides comfort and protection to players as they run and fall on the surface. It also helps control the way the ball interacts with the surface, allowing characteristics similar to natural grass to be provided.

There are a number of different infill materials used within the pile of a synthetic turf sports surface. These include natural materials such as sand or cork or infills made from rubber or other forms of polymer. Most polymeric infills are in the particle range 0.5 – 2.5mm.

The development of third generation synthetic turf sports fields has revolutionised the availability of good quality football and rugby fields that can sustain high levels of use irrespective of climate or location. This allows hundreds of thousands of people to participate in sport every week. This has a direct, positive benefit on society through social inclusion, improved health, less obesity etc. The levels of use placed on a synthetic turf pitch will differ, with many in high population urban areas being used for up to 80 hours per week. A more moderate estimate shows that for a full-size football or rugby pitch, use may be:

Assume evening use (5pm – 10pm) = 5 hrs per day for 5 days a week
Assume weekend use (9am to 4pm) = 7 hours / day
Therefore: 5 days @ 5hrs = 25hrs, 2 days @ 7hrs = 14hrs **Total use = 39hrs**
50 weeks @ 39 hours per week = 1950 hrs/year/pitch

Assume average of 30 players per pitch (11 v 11 plus substitutes and match officials or 4 No. 5 v 5 matches, or more for training sessions during evenings, etc.)

30 people per pitch = 58,500 hours of physical activity/ year/full size pitch

Many synthetic turf pitches are located in schools and colleges and are used for a combination of curriculum and community use, but this has been excluded from the calculation shown.

Many European countries do not keep or publish records of the number of synthetic turf fields in their region. However, ESTC understands that in countries where records are maintained the following indicates the number of facilities currently installed.

Country	Fields (full sized)	Country	Fields (full sized)
Belgium	400	Netherlands	2300
Denmark	325[1]	Norway	1750[1]
England	1300[2]	Scotland	350
France	2800	Spain	2500
Germany	3500	Sweden	1336[1]
Ireland	100	Wales	50
Italy	1000	**Total**	**17771**

17771 fields across Europe, each being typically used for 58,500 playing hours per year equate to over 1000,000,000 playing hours or over 33,000,000 people participating and benefiting in sport played on synthetic turf fields.

AMI report[3] that the annual market for synthetic turf for all applications in Europe has grown from 38.8 million metres square in 2011 to 66.7 million metres square in 2017 and is predicted to rise to 115.1 million metres square in 2021. AMI also report that contact sports such as football and rugby are the largest end-use applications and that these primarily use longer pile synthetic turfs with infill. AMI report in 2017 these surfaces equated to 47% of total global synthetic turf sales. With a typical synthetic turf football pitch having an area of 7420m^2 47% of 66.7 million metres square equates to approximately 4200 new fields being built in Europe in 2017.

Social and economic benefits of synthetic turf football pitches

Grassroots sport brings diverse communities together. For example, 40% of community football clubs in England are in the top 20% most deprived communities[4] and players report significantly higher levels of happiness, general health, confidence and trust compared to those who play no sport[5].

[1] Report for the purchasing group of The Swedish Association of Local Authorities (SKL) Market analysis artificial turf 2018-08-31
[2] 1150 fields register on the English FA Register of 3G pitches and 150 rugby pitches registered with Rugby football Union
[3] AMI Artificial Grass – The Global Market 2018
[4] FA Participation Data, Sport England, 2018
[5] English FA Social Impact Study, 2018

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UEFA's GROW SROI-model[6] show significant positive effects and positive economic values on football in Sweden:

- Economy - 3157m SEK: economic value by consuming football, employments and return on infrastructure projects;
- Social effects – 6742m SEK: activity increases, less crime, better educational results;
- Health - 12 900m SEK: healthier people, decreased risks for diabetes and a variety of diseases.

ESTC believes the benefits identified in England and Sweden can be considered representative for other European countries using synthetic turf football fields.

Types of infill used in synthetic turf fields and alternative solutions

The vast majority of long pile synthetic turf fields built across Europe have some form of polymeric infill. The type and quantity used varies country to country, sport to sport.

Infill sourced from End of Life Tyre granulate is by far the most commonly used infill but infills produced from virgin grade EPDMs and TPEs are also used, extensively in some markets.

Polymeric infills have been proved to be hard wearing and able to provide the levels of sports performance and most importantly, athlete protection, that users and sports governing bodies require.

A small percentage of new fields are now being built using organic infills such as cork, timber granulate coconut fibre. Industry still has limited long-term experience of these infills and there are questions about their long-term sustainability, with at least one life cycle[7] analysis reporting that organic infills in some climates needing to be replaced every four years or so during the life of the pitch. Organic infills generally float and their suitability as infill material in climates that experience prolonged heavy downpours of rain, is being questioned in the market. Some forms of organic infill require water to keep them moist. These forms cannot be used where the ability to keep the fields moist is financially or environmentally unachievable. Additionally, some forms hold moisture and are not suitable for regions that experience cold conditions. The surface freezes and is unplayable.

The ability of organic infills to replace polymeric infills is also very questionable. The availability of adequate supplies of organic infill is considered very unlikely. There is already limited availability of cork, the grades being used as infill effectively being the surplus waste material being produced from more high-end markets for cork.

Some limited trials and installation of biodegradable infill has taken place, but their longevity and performance is still unclear. Additionally, the supply chain currently also appears to be limited.

[6] SROI – ett business case för att visa samhällsnyttan med breddfotboll – för att säkra hållbara investeringar och strategiska partnerskap inom fotbollen.

[7] Kristin Johansson, Ragn-Sells Däckåtervinning AB, Life cycle assessment of two end-of-life tyre applications: artificial turfs and asphalt rubber, 2018

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Non-filled long-pile synthetic turf surfaces have been developed and introduced to the market, but to date, none have been found to satisfy the sports performance and player welfare requirements of FIFA and World Rugby. This primarily relates to problems with low foot grip, resulting in players slipping and falling and the potential for players to suffer carpet burns when they slide on the surface; which historically has always been a concern to players using synthetic turf surfaces.

Although football and rugby originated, and is still played on natural grass, the levels of use a natural grass sports pitch can sustain will depend very much on the local climate and level of maintenance that can be undertaken. KPMG report[8] that natural turf pitches typically can be used for up to 5 hours play per week, with up to 10 hours being possible if field operators are willing to increase. Sport England[9] state that the highest quality natural turf pitches can sustain four to six hours use through the playing season (typically 40 weeks). Importantly, in some conditions natural grass cannot be used at all (too wet, or too cold) and even in less harsh conditions, even minimal use can result in significant damage requiring extensive downtime for repair and reestablishment of the playing surface.

Typically, it is stated that you require between three and six natural grass pitches to sustain the use accommodated by one synthetic turf pitch. To replace over 17,000 synthetic turf fields with an adequate number of natural grass fields would require approximately 85,000 new fields, each of 7,400m^2; an area of land that is just not available in many urban environments

KMPG report that the maintenance costs for a natural turf pitch can be up to 2.5 times higher than maintaining a synthetic turf pitch. With at least three and, more typically, five natural grass pitches being required to replace each synthetic turf field, this would increase maintenance budgets ten-fold. With KMPG reporting that the maintenance costs (in 2012) of a grass pitch are typically over €20,000, this would be a major financial burden for municipalities, etc to absorb.

Implications for existing fields of any ban on polymeric infills

A major concern to those operating and using fields today that contain polymeric infills, is what any restriction on the production and supply of such materials will mean for existing fields.

A synthetic turf sports surface is designed to provide the sport's performance and player welfare characteristics considered necessary to allow sports to be played satisfactorily and safely. It is the combination of synthetic turf carpet, infill and possibly an underlying shockpad that provide these properties. If any one component is changed the playing surface will not perform as designed and intended.

It is also important to consider that you cannot simply remove a polymeric infill and replace it with an organic infill. Many fields with polymeric infills, satisfy the sports performance and player welfare regulations due to the elastic properties of the infill. Organic infills provide limited or no impact attenuation properties so such a system needs to include an impact absorbing shockpad that is laid beneath the synthetic turf carpet. This

[8] KPMG Sports Advisory Practice. Synthetic Turf Study in Europe, 2012
[9] Sport England Design Guidance Note – Natural Turf for Sport, 2011

means existing fields would have to be fully resurfaced, not just have the infill changed. Typically, this could be expected to cost at least €200,000 per field.

A synthetic turf playing surface is normally expected to last between eight and ten years. Through this period top-dressing of the surface with additional infill, to compensate for infill compaction etc is required. If polymeric infills are no longer available on the market the performance of fields will deteriorate more rapidly than field owners envisaged, and they will be faced with having to either replace the synthetic turf surface sooner than budgeted or close fields due to them becoming unsuitable for use. Failure to be able to top-dress fields will also invalidate many manufacturer's warranties.

Significant time would be required to enable the infrastructure changes required to meet any enforced replacement of polymeric infills and this would greatly compound the availability concerns around organic infills due to the higher frequency need to replace / top-dress fields with organic infill.

The amount of infill released to the environment

A number of studies have been made into this topic, but many appear to be based on assumptions, resulting in conclusions that the volume of infill that is applied as periodic topdressing of a field equates to the quantity being lost to the environment. Reality shows there are a number of different pathways and only limited amounts are released to the environment. Examples from Sweden, The Netherlands and Denmark repeat the real loss is much lower.

Swedish study

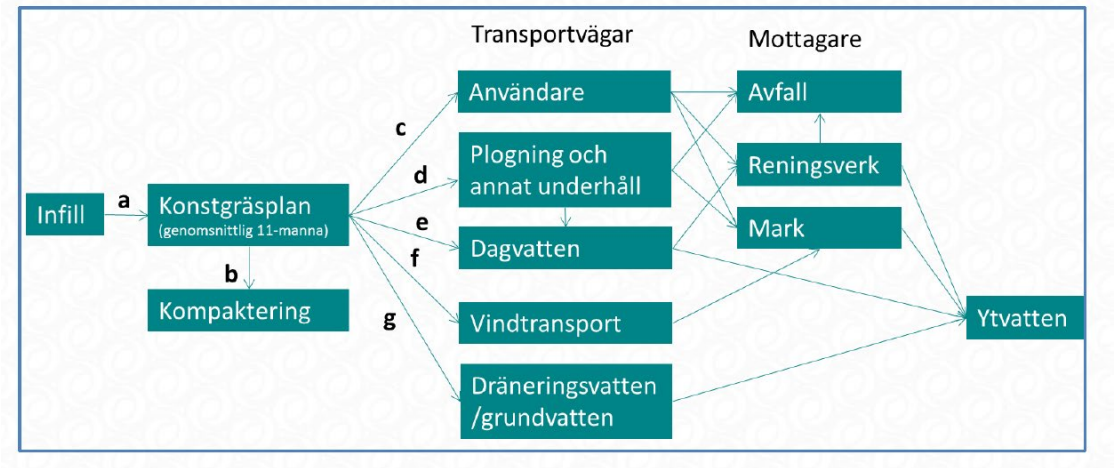
The main routes for spreading of infill are summarised in the figure below[10]. Estimated data compiled by IVL the Swedish Environmental Research Institute, show the main transport routes for infills:

- Quantity infill added within first 2 months of field operation: 1-2 ton
- Compacting effect[11]: 0.2 - 1 ton/year or more
- Users[12]: 0,04 ton/year
- Ploughing of snow and other maintenance: 0.5 ton/year (snow removal is considered to be a major source of infill migration, but is only routinely undertaken in Scandinavia)
- Water; draining water and ground water: up to 34kg/year, depending on form of field drainage
- Wind dispersion: probably non-existent due to the weight of polymeric infills.

[10] Sammanställning av kunskap och åtgärdsförslag för att minska spridning av mikroplast från konstgräsplaner och andra utomhusanläggningar för idrott och lek. 2019-04-29

[11] Fleming et al., 2014. Understanding the effects of decompaction maintenance on the infill state and play performance of third-generation artificial grass pitches

[12] Forskningskampanjen 2017 - «Sjekk kunstgressbanen»! , 2017.



Summary of the main routes of spread of infill from a synthetic turf. Reference from IVL, the Swedish Environmental Research Institute, report C359, 2019.

Dutch study[13]

Between 250 to 325 kg per field is lost directly to the surrounding area's (grass and pavements) up to 2m around the field and to a depth of 15 cm deep. In the surrounding borders infill is accumulated but not dispersed further. During the renovation of a field this can easily be removed, preventive measures and best practice introduced to minimise this contamination.

Tabel 5.1: Resultaten (afgerond) verliesstromen per veld

VELD	SOKKEN EN SCHOENEN	VEGEN	AFVALWATER	OPPER-VLAKTE-WATER	GRASBERM	VERHARDING
	KG/JAAR	KG/JAAR	KG/JAAR	KG/JAAR	KG/JAAR	KG/JAAR
Rotterdam SBR	12	20	0,9	0	260	1
Amsterdam SBR	12	9		10	240	60
Hoogeveen SBR	12	0	0,3	6	240	40
Utrecht TPE	12	5		100	15	2
Den Haag kurk	12	40		0	4	3

[13] Quantitative study by BSNC: Rapportage-Verspreiding-van-infill-en-indicatieve-massabalans, 2017

Danish study[14]

The Danish Technological Institute (DTI) has made a critical assessment of the mass migration balance of rubber granulate from synthetic turf pitches, with a focus on loss to the environment with a focus on discharges to the aquatic environment.

The DTI report includes date from a study in Norway[15], where more than 12,000 players were monitored to determine how much infill they do really take out of the pitch. The average annual loss per pitch was reported at 40kg/ year.

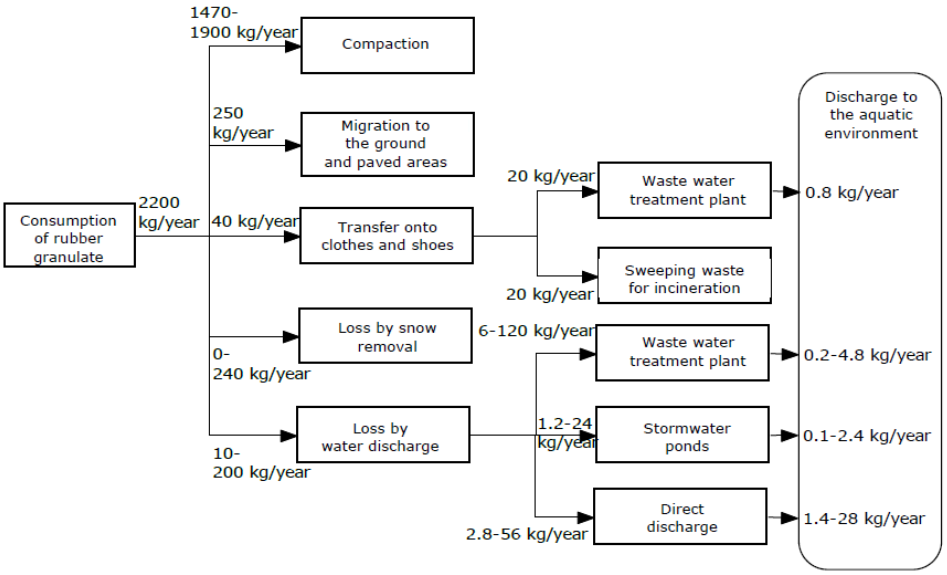


Figure 2. Division of mass balance for rubber granulate according to the newest literature. Numbers are based on the best estimate based on measurements and assessments, but the uncertainty of these numbers is high. To reach reliable results, additional measurements must be carried out.

Based on these studies ESTC conclude that the loss to the environment is limited and the main reason for the periodic top-dressing of a field is to compensate for compaction of the infill within the synthetic turf surface.

Potential risk of infill migration into the environment

Guidance on the ways of controlling infill migration was published by ESTC in 2017[16]. This guidance is currently being reviewed and enhanced, an updated guide being ready for publication by the autumn of this year. By adopting a range of simple design features to ensure infill remains within the footprint of the

[14] Teknologisk Institut – Massebalancer af gummigranulat fra kunstgaesbaner_2018
[15] Rapport Forskningskampanjen_2017
[16] ESTO, Minimising the risk of synthetic turf surfacing being a source of micro-plastic pollution

synthetic turf pitch and ensuring fields are correctly maintained (something the industry has been advocating for many years), ESTC believes the risk of risk of infill migration can be significantly reduced and or eliminated in many cases. This approach is already implemented in a number of countries and advocated by various organisations[17].

Examples of infill containment and entrapment are shown below.

<table>
<tr><td colspan="2">   </td></tr>
<tr><td colspan="2">Catchment gates and grids at pitch entrances[18,19]</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Combined field edge detail and infill migration barrier[20]</td><td>Fence barrier to contain infill within the field area [19]</td></tr>
</table>

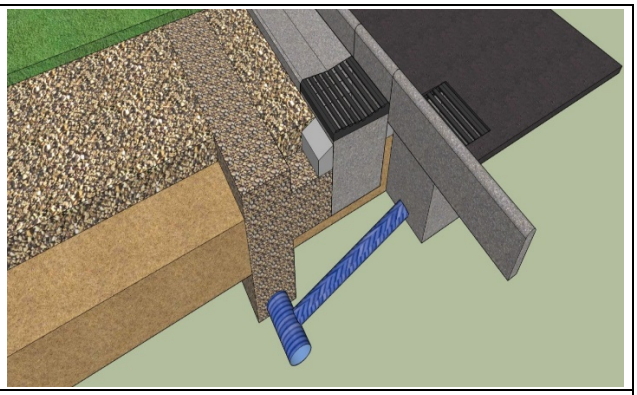
[17] Fidra: Pitch-In to Reduce Micro-plastic Loss from Artificial Pitches: Guidelines for Designers and Procurement Specialists, www.fidra.org.uk, 2018
Broschy, Fotboll, Konstgräs & Miljö, www.stff.se
BSNC Plan of Action - Clearance and prevent the spread of micro-plastics
Miljo-og Fodevareministeriet Milostyrelesen Vejledning om kunstgræsbaner Planlægning, drift og affaldshåndtering

[18] Fidra: Pitch-In to Reduce Micro-plastic Loss from Artificial Pitches: Guidelines for Designers and Procurement Specialists, www.fidra.org.uk, 2018

[19] KUNSTGRAS met kurkhet grasvan de toekomst? PRESENTATIE DOOR: Gerritde Koe

[20] Design by Eurofield, France

Surface water intercetion drains & filters[21]



Surface water intercetion drains[20]

Storage area with internal drainage (and filters) for snow clearance

Profiled paved margins to seperate synthetic turrf from surrounding environment[22]

Boot cleaning stations[23]

[21] https://iaks.sport/sb-magazine/22019
[22] Polytan GmbH
[23] http://www.vindico-sport.de/produkte/

The synthetic turf industry is also developing surfacing solutions that will reduce the amount of infill used in synthetic turf surfaces and its ability to migrate. Increasingly the market is asking for surfacing systems that include shockpads. Shockpads are designed to contribute to the impact absorption properties of the playing surface. By including shockpads in the surfacing system the need to have high volumes of infill within the surface is reduced. Shockpads also reduce the rate at which the infill compacts, meaning less frequent top-dressing is required. Initially driven by the desire to reduce the spectacle of infill splash on televised matches FIFA has developed a test[24] that assesses the potential of excessive splash to occur. Systems with low splash characteristics will not suffer from infill migration to nearly the same degree as systems with higher infill splash.

Good maintenance, using the correct specialist equipment, is also an important consideration when addressing infill dispersion. The need to maintain synthetic turf surfaces is something the industry and sports federations both recognise and advocate. ESTC already issues guidance on appropriate maintenance procedures and is, again, in the process of reviewing and updating this to ensure that the need to consider the impact on the environment of poor maintenance is communicated.

To increase awareness of these control methods ESTC, through its participation with the European Standards Committee (CEN), has advocated that CEN TC 217: Surfaces for Sports Areas, develop a CEN Technical Report to promote the design and maintenance features that will minimise/ eliminate the potential for infill migration from sports fields. This Technical Report will support European Standard EN 15330-1: *Specification for Synthetic Turf Sports Surfaces*. CEN is currently seeking approval of the National Standards Bodies to approve this new work item, and it is hoped that the Technical Report can be published by early 2020 latest.

ESTC is also in conversation with FIFA and World Rugby to see if the two international sports federations for sports that are the primary users of synthetic turf fields containing infill within Europe will endorse the containment processes being considered and incorporate them into their respective field certification programmes[25].

Conclusions

ESTC fully recognises the need to reduce and prevent microplastic pollution and acknowledge that polymeric infills fall within the proposed REACH definition of a micro-plastic. ESTC does not believe the severity of microplastic pollution of the environment is as problematic as some have suggested especially if snow removal is undertaken responsibly.

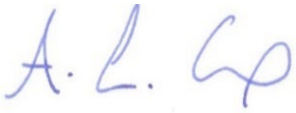
ESTC does believe that through good field design and maintenance the quantity of infill migration can be reduced even further and that through the promotion of good practice and the support of sports federations, funding agencies and national governments this approach can become the norm throughout Europe.

[24] FIFA Handbook of Test methods for Football Turf
[25] FIFA Quality Programme for Football Turf, World Rugby Regulation 22 – use of synthetic turf rugby pitches

With such policies in place ESTC believes that a ban on the use of polymeric infills becomes unnecessary and requests that polymeric infill materials for synthetic turf sports fields be granted derogation from the proposed REACH restriction. By granting derogation the risk of communities across Europe suffering negative social, health and economic consequences, through having reduced access to good quality sports facilities, is removed.

Yours sincerely

Stefan Diderich
ESTC Director General



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