Svensk Däckåtervinning AB (SDAB), The Swedish Tyre Recycling Association, Reply to the Public Consultation on the on the Annex XV dossier under REACH proposing a restriction on intentionally added microplastics

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Introduction of SDAB, the Swedish Tyre Recycling Association

SDAB is the management company for the Swedish legislation (Förordning 1994:1236) on producer responsibility for end of life tyres (Producentansvar för Däck)). In Sweden all used tyres from the aftermarket are collected by SDAB and processed in an environmentally-friendly way.

SDAB is an irreverisibly non-profit organisation that administers the EPR for tyres. Operations for collecting, processing and marketing recycled fractions of the material is out-sourced in single source open tenders every 5 years. SDAB does not sell any recycled material but supports research in the area of using the material as well as defines criteria for safe and environmentally friendly use os the material. Hence, SDAB har no preference of our own regarding the use of recycled tyre material in different applications. Nevertheless, SDAB supports good use that will contribute to society and therefore SDAB supports the use of tyre granulate in artificial turf. The risks are low and manageable and the alternatives are not as good from the perspective of total environmental impact, resource management, pitch performance, player safety, land use and economy.

SDAB is financed through eco-fees on tyres in different categories. The fees are used to finance the operation of the contractor who process the end of life tyres in an environmentally- friendly way. As a result, we prevent scrap tyres from lying around in the environment, we reduce the need for primary raw materials from nature and we reduce CO2 emissions by doing so. RecyBEM is an initiative by the producers to fulfil the obligations set out in the Swedish legislation on waste management for end of life tyres and is owned by the tyre importers association (80%) and the tyre distributors/workshops association (20%). No dividend can be given. SDAB funds annual surplus from its operation to a fund dedicated to research and to support the future collection of all tyres under the legislation in the market (the full population).

SDAB collected some 95.000 tons of end-of-life tyres in 2018. Since the beginning in 1994, in the reach of 2 million tons of tyres have been collected.

SDAB has taken an initiative for an international certification system for responsibly recycled tyres, called CERUB, that will be launched in 2019.

Summary of the reply

We herewith present the SDAB reply to the Public Consultation on the Annex XV dossier under REACH proposing a restriction on intentionally added microplastics. Parts of the reply has been prepared in co-operation with RecyBEM of the Netherlands.

In the Sweden, as well as in Scandinavia and the Netherlands, for the last two to three years there has been a lot of attention for the impact of the use of SBR rubber granulates on health and the environment. In response to the first negative attention, the Dutch organisation RIVM announced in December 2016 the results of the research into the risks of sports on synthetic turf with rubber granulate. According to the RIVM and later ECHA, February 2017, **sports on artificial fields with rubber granulate is safe**. The RIVM and ECHA however did advise a specific health standard for the rubber granulate. This is dealt with in a separate Annex XV dossier under REACH proposing a restriction on eight polycyclic aromatic hydrocarbons (PAHs) in granulates and "mulches" used as infill material in synthetic turf pitches or in loose forms on playgrounds and in sports applications.

For our reply we have looked at a number of aspects of this proposed restriction of additionally added microplastics. We are concerned about the proposed restriction of the use of rubber granulates as infill in artificial turf. We are of the opinion that it is of **essential importance that a derogation is put into place**. This to enable the continued use of a proven best material in terms of cost and benefit to society. In Sweden the material yearly contributes to more than **30 million extra individual exercise hours** compared to natural grass pitches.

There have been a number of studies identifying the spread of rubber granulates to the vicinity of the fields. In recent studies the spread of the material is more limited than has been identified in the earliest research. And **with the right actions the issue of spread can be made manageable to a neglecable level of spread**. And is therefore a question of good, simple housekeeping and design of the artificial turf fields. We have to deal with the application and material in a sound and environmentally friendly way. With the right construction and management practices this is easily obtainable. Next to this there is the question of circular economy.

The use of rubber granulates from end of life tyres is a proven application of a recycled material. The proposed microplastics restriction will **lead to the end of rubber infill**. To date there are no material recycling alternatives to compensate for the market loss of approximately 30% (EU) and 10% (Sweden) of the offset markets for ELT derived rubber. As a result, this material stream will have to be used in other applications or into energy recovery. Thus, the current microplastics restriction proposal is also a **question of continued circularity** when it comes to the end of life tyre market.

The use of recycled tyre rubber in football applications is offering an unrivalled solution to the most available playing time given the least total environmental impact, the minimum use of land, the best player performance, the least player injuries and the lowest cost, according to Life Cycle Analysis, experience from the Swedish Football Association and financial information from Swedish municipalities procuring artificial turf.

SDAB
SVENSK DÄCKÅTERVINNING AB

In order to present our case for a **derogation** the following elements will be presented:

Rubber granulates are used as infill on artificial turf fields

It is important to consider the positive influence of sporting on any surface. Lauren Jenks, Washington State Health Department: "There are fewer cancer cases among 'artificial grass footballers' than might be expected based on the incidence of cancer among residents of Washington of the same age category. The Washington State Department of Health, therefore, recommends that people who enjoy football should continue to play, regardless of the type of field surface. It would be relevant to investigate to what extent the practically negligible cancer risk will be compensated by all the hours people are spending on their football fitness and health by playing on these artificial turf fields. The Washington state health department states in their report that people who enjoy soccer should continue to play regardless of the type of field surface[1]

In many countries, including the Nordic countries and the Netherland,s artificial sport fields are essential to ensure year-round facilities to play sports on.

More than twenty years ago the first artificial turf field was constructed in the Netherlands. The last years artificial turf has made a breakthrough in amateur football. The big advantage of these fields is that they can be played on in almost all-weather conditions. They can be used all year round in a much more intensive way than natural grass fields[2]. Natural grass provides in average 700 playing hours per year and artificial turf with tyre granulate 2.800—3.500 hours.

To be able to give these artificial turf fields comparable characteristics as natural fields they have to be filled in with infill material. Of the more than 1000 full size artificial turf fields in Sweden more than 50 percent is filled in with rubber infill from tyres[3]. A lot has been written and said about SBR infill. Although the opposite has been proven (American studies, RIVM, ECHA) by research it has been said that playing sports on rubber granulates will cause cancer. It is very disappointing that the reuse of tyres has been so negatively approached in the media, because with the use of recycled tyres on artificial turf fields a contribution is made to the circular economy and a sustainable society. By the use of SBR granulates millions of kilograms of CO_2 are for instance saved. And also, virgin materials like crude oil do not need to be used, which is the case for other infill materials. Furthermore, the SBR granulates are also useable after 10 years (the usual service life of an artificial turf field), while other alternative infill will last at most five years.

The reuse of tyres as rubber infill gives an environmental saving of 1,1 kg of CO_2-eq per kg compared to virgin materials. This means that the use of EPDM instead of rubber granulate gives more than 200.000 kg of CO_2-eq emissions more per artificial turf field. In comparison having a field with rubber granulates avoids the CO_2 of 1,5 million car kilometres compared to having a field filled in with EPDM. And the use of cork in one field needs a permanent source of 130 football fields of agricultural land that cannot be used for the production of food. The good score of rubber infill in terms of sustainability and sport technical performance is for constructors, users and field managers also one

[1] Washington state health department, Revised April 2017 ,Investigation of Reported Cancer among Soccer Players in Washington State, https://www.doh.wa.gov/Portals/1/Documents/Pubs/210-091.pdf

[2] https://www.knvb.nl/assist/assist-bestuurders/accommodatie/kunstgras

[3] https://www.knvb.nl/assist/assist-bestuurders/accommodatie/kunstgras/dossier-rubbergranulaat-kunstgras

of the main reasons to choose for rubber granulates. Biodegradable infills have been evaluated but offers less playing hours, more dust, more injuries on players and may cause larger environmental impacts from farming (water, pesticides, fertilisers -that to 30-40% leaks out to water systems and eventually lakes or the ocean. It must also be considered that pitches without rubber infill, using only sand, give a higher wear on the plastic straws than when rubber is used. The direct grinding of sand on plastic give more small size microplastics that are closer to water in density and therefore can be mis-taken for plankton if reaching waterways.

Potential routes of dispersion of crumb rubber from synthetic turf fields

The routes of dispersion discussed below are with current forms of field management. And not a result of best management practices being introduced. Therefore, these numbers should not be misinterpreted. It is also important to mention that the spread of rubber granulates reported in the latest research is not at a level of the earliest quantification reports, which reported losses up to several tons per year.

IVL Swedish Environmental Research Institute was the first research institute to pay attention to the potential problem of spreading of microplastics from artificial turf. A first study, published in 2016, warned of very large spread of granulates. After this, IVL has released three more studies that for each new study radically reduced the size of the estimated spread. The latest study, published in 2019, presents a spread of 3.4 kg of granulates per pitch and year. Compare with 4000 kg + - 25% per pitch in the first study. The figure below is compiled by Simon Magnusson, Luleå Technical University and was presented in April 2019.

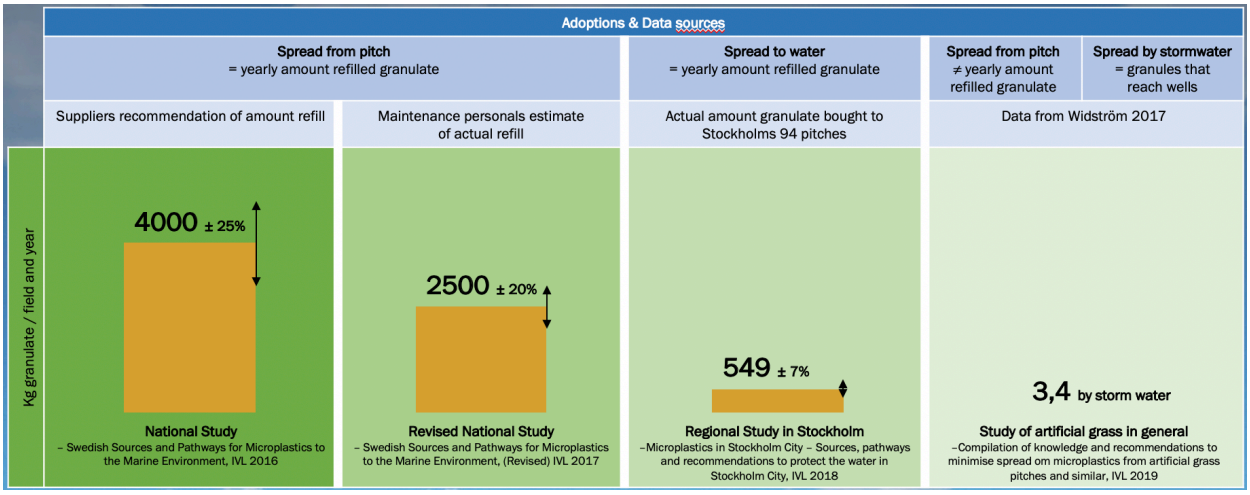

FIGURE 1 : EVOLUTION OF AVAILABLE DATA ON THE SPREAD OF RUBBER GRANULATES TO THE SURROUNDINGS OF A FIELD

Compaction

A point also needs to be raised on the phenomena of compaction, the study *Understanding the effects of decompaction maintenance on the infill state and play performance of third-generation artificial grass pitches¨* [4]offers a comprehensive quantification on how compaction could reduce the volume of infill materials. Quoted *´The compaction leads to hardening of the surface, associated with higher impact forces for player–surface contact (i.e. lower FR from mechanical tests), and increased VBR. If the surface becomes too hard, it may affect the user performance/safety and potentially fail the field accreditation tests (e.g. FIFA6) and require some investment to bring it back to a satisfactory standard´*

Volume reduced due to compaction is estimated to be in average 12-13 tons or more than 10%. This exceeds by far the first estimates off losses of 3-5 tons as the main reason for refilling and hence disqualified refilling as a measure of spread from the pitch. Measures to mitigate the effect of compaction require the use of adequate machinery that shakes and vibrates the fields. Sometimes refill is required as decompaction is not adequately applied. This practice of refill due to compaction is often signalled as dispersion and lost material. An inadequate analogy that drives to confusion and does not correspond to the reality of dispersion in the field.

Potential spread per identified route

The spread of rubber granulates into the environment can be divided into two main routes. Via weather or natural forces and via human activities. Namely the use of players and audience members and the maintenance of the field.

This section will go into the different identified routes of dispersion with the amount of identified spread of rubber granulates via these routes according to the latest research. The section following this section will go into the mitigation measures to ensure that this amount of spread does not occur.

Natural forces

After a continued use of the filed, the crumb rubber suffers from dispersion of crumb rubber and compactions, two process that required the adequate maintenance in order to mitigate them and avoid them.

Rubber granulate dispersion is mainly due to weather conditions, like episodes of heavy rain, winds, and snow. In case of these occurrences, crumb rubber might spread thought the drainage system. The amount of crumb rubber that can be infiltrated through an artificial turf to its drainage was quantified to a maximum of 3[5] kilos per year.

Spread could also happen at <u>storms water wells</u> placed along the field - an average of 1.3 kilos of granulates end up in the storm water wells / year, as can be found in a Swedish study by Karin Widström (see reference). The study identified great differences in dispersion between fields depending on how they were built and how they are managed.

[4] Fleming PR, Forrester SE, McLaren NJ. Understanding the effects of decompaction maintenance on the infill state and play performance of third-generation artificial grass pitches. Proc Inst Mech Eng P J Sport Eng Technol. 2015;229(3):169–182. doi:10.1177/1754337114566480

[5] Karin Widström, Migration av gummigranulat från konstgräsplaner, Institutionen för naturgeograf of Stockholm University, 2017

Beyond the spread through drainage systems and storm water wells, during wet episodes of stagnation of water, crumb rubber could stick on machinery and other ancillary equipment used for maintenance of fields. This phenomenon that has been observed has not been quantified.

Snowing also amplifies potential dispersion. The use of snowploughs triggers the removal of a fine layer of granulates that could unintentionally be placed outside the field in the surroundings. This is not related to the material but to mis-handling and littering that has proven to be able to be handled with easy means.

Use of the field

The other routes or dispersion are due to the use of the fields and maintenance activities. During playing, small particles of crumb rubber could end up in the shoes of players, inside the clothing or stack to the skin. The study conducted in Norway[6] involving 12,500 players found that 0.88 grams per player and opportunity risked disappearing from the pitch with the player at each activity. This dispersion can also be originated from the activities of visitors of football matches. The figure equals to ca 13 kg per pitch and year in Swedish conditions -of which the most can be handled with fairly easy means.

The use of machinery to perform activities of maintenance of field also can originate the dispersion of crumb rubber. Typically, maintenance activities involve the collection of debris and the decompaction of the fields, examples of those machinery are in the figures hereunder. Small quantities of crumb rubber could unintentionally remain stacked to the machinery.

Does Rubber granulates on artificial turf contribute to the plastic soup?

The composition of rubber granulates is such that the particles are too heavy to be transported by air. They therefore remain largely on the pitchside. Rubber granulates are also heavier than water. When they end up in water, they sink to the bottom. They have a sedimentary character, which means that drainage to rivers and then oceans is not obvious. The BSNC report[7] shows that rubber granulate is mainly found 1.5 meters from the field. This research shows that a limited part of the rubber granulates can wash into the ditch with rainwater. The rubber then sinks to the bottom of the ditch and is removed from the ditch during dredging. The chance that rubber from an artificial grass field will eventually end up in the sea is negligible. And also, important good housekeeping can prevent the spread of rubber granulates into the surroundings of an artificial turf field.

There may indeed be fields where there is too much rubber in the immediate area around the field. The rubber is then mainly in the top 10 cm. Any clean-up costs are then determined by the surface of the surrounding area immediately around a field (up to approx. 1.5 m). The fields studied in the BSNC report in Amsterdam, Rotterdam, The Hague and Utrecht have an average of around 160 m2 of

[6] Rapport fra forskningskampanjen 2017 https://www.miljolare.no/aktiviteter/kunstgress/rapport

[7] Annet Weijer and Jochem Knol. Verspreiding van infill en indicatieve Massabalans. BSNC i.s.m. gemeenten Rotterdam, Utrecht, Amsterdam en Den Haag. Sweco Nederland B.V. 4 mei 2017. https://www.bsnc.nl/wp-content/uploads/2017/05/Rapportage-Verspreiding-van- infill-en-indicatieve-massabalans.pdf

roadside around a field. The results of this study were on fields without the best management practices and design that have since been identified. With the right management practices and design af a field the amount of spread from the fields can be reduced.

Therefore, when renovating old fields where systematic measure have not been taken to reduce spread of granulate, it is recommended to scrape the top layer (10 cm) off the surrounding area directly around the field and remove this soil if total cleaning is desired. It is also advisable when cleaning the waterways not to store the sludge on the waterway side but to dispose of it. These recommendations only have added value if afterwards the management is set up to prevent the new spread of rubber infill from the artificial grass field. The next section will go into the mitigation measures to reduce the amount of spread of rubber granulates from fields.

Risk Management measures that will mitigate the identified dispersion in the field

This section will go into the best management practices and the design practices that can reduce the spread of rubber granulates into the surroundings of an artificial turf pitch. Most countries now have launched national recommendations to the establishment of new pitches as well as the use and maintenance of current ones. The results are very positive and spread has been further reduced from already low levels.

As discussed in the previous section the spread of rubber granulates can be divided into natural forces and the use of a field.
The amount of rubber granulates that can be carried off the field by natural forces can be easily dealt with within the design and construction of a field. Most notably these are filters and settlers in the water run off treatment from the hardened areas next to the field and filters and settlers in the drainage water system. Other recommendations include the use of boards along the field where the end of the field is raised a little to ensure nothing goes underneath the boards. What players carry with them off the field is easily dealt with using single entrance areas and cattle grids.

The purpose of these recommendations are to:

1. Create awareness among stakeholders about their role in preventing the spread of microplastics;
2. Activate stakeholders to take appropriate measures to prevent spread of rubber granulates
3. Gain knowledge and experience with regard to the effectiveness of the proposed measures;
4. Develop and share knowledge with regard to taking appropriate control measures.

To prevent micro-plastic dispersal around an artificial grass field, two approaches are important:

I. Possible technical measures: consisting of technical measures to keep the infill and artificial grass wear waste on the field.
II. Maintenance measures: Good house keeping.

Set up clear maintenance and usage guidelines

The first step for any field owner should be to set up clear maintenance and use guidelines. The preparation of clear maintenance and usage guidelines, with a practical explanation of the need to prevent the spread of microplastics. The 2014 KNVB maintenance booklet can be used for this.

Content can be brought to the attention of the managers via initial consultations, information and courses. Part of awareness, explanation of utility and necessity and creating support;
Sweeping waste and sludge must be disposed of as residual waste and not as organic waste;

Granulate traps and filters

Granulates traps and filters in drainage lines minimise the risk of granulates entering watercourses or storm dells water systems. Drainage lines should be tied together in a closed system that is led to a well with a filter that cleans the water before it reaches the water well. The granulate traps should be cleaned regularly and the material should be disposed of as waste.

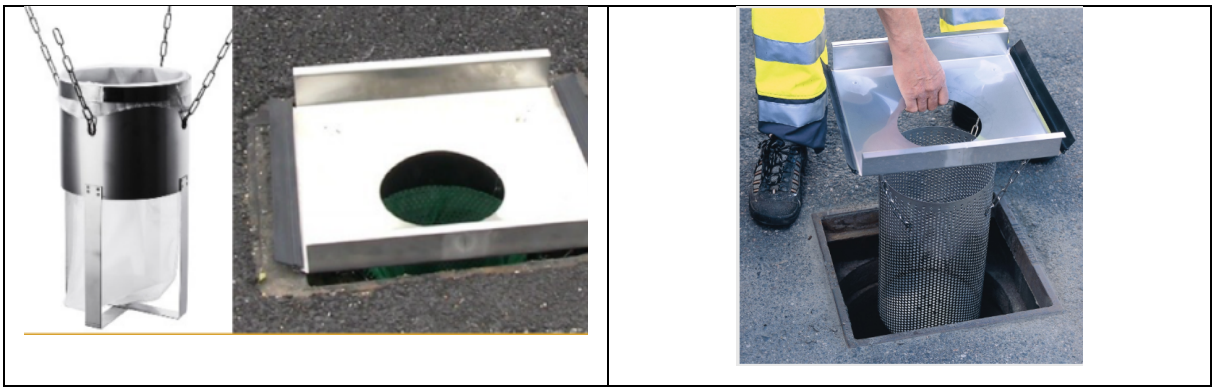

FIGURE 2 : DETAIL OF A GRANULAR TRAP

Perform leaf blowing from outside to inside

FIGURE 3 : PERSON PERFORMING LEAF BLOWING ACTIVITIES FROM OUTSIDE TO INSIDE

Leaves that fall on the artificial grass field do not blow into the roadside or bushes but remove them on the field and dispose of them as waste. By blowing the artificial grass field outside, you blow out microplastics that lie on the artificial grass field and you ensure further distribution

Clean up the infill that has spread outside of the field

FIGURE 4 : EXAMPLE OF A MACHINE THAT IS CAPABLE OF COLLECTING RUBBER GRANULATES THAT HAVE ENDED UP NEXT TO THE ARTIFICIAL TURF FIELDS

Existing visible rubber granulate rubber that is outside of the field should be cleaned up. This can be done by vacuuming up the material and disposing it as waste material.

Collection areas around the pitch.

The area around the pitch should be paved so that the granulates from for example, snow removal, can easily be swept back. The Swedish Football Association[8] recommends that lighting masts and obstacles should be placed at least 3 meters from the side line.

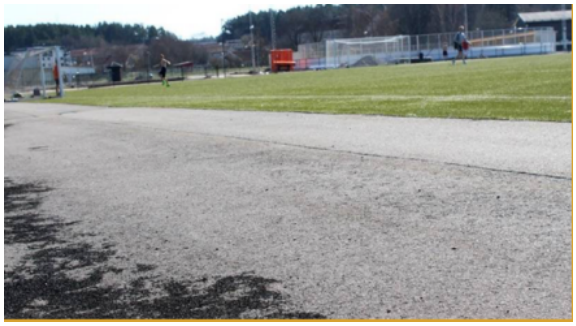

FIGURE 5 : EXAMPLE OF PAVED AREA AROUND THE FIELD TO EASY THE COLLECTION OF GRANULATES DISPERSED

[8] Svenska Fotbollförbundets Rekommendationer för anläggning av konstgräsplanerUtförandebeskrivning

Perform maintenance under dry weather conditions.

Carry out all maintenance during dry weather conditions avoid the granulates to stick to shoes, machines and equipment

FIGURE 6 : EXAMPLE OF MAINTENANCE ACTIVITIES

Brush station for players and leaders.

Place a decontamination area with brushes off the granulates at a designated location where it can be collected and returned to the football field. Promote cleaning routines to prevent granulates from entering the showers shall be also considered.

FIGURE 7 : EXAMPLE OF A BRUSH STATION FOR PLAYERS TO REMOVE THE GRANULATES FROM THEIR SHOES

Fence with one single entrance and ¨cattle-grid¨.

Enclose the entire area with a fence with only one exit. Provide the exit with a cattle grid where visitors can stump of granulates. Provide the pitch with a high ridge to prevent granulates to be spread to other surfaces.

FIGURE 8 : EXAMPLE OF A SINGLE ENTRANCE POINT WITH CATTLE GRID TO CAPTURE RUBBER GRANULATE

Location for cleaning maintenance equipment

Maintenance is essential to maximize the investment and benefits of a synthetic turf surface. But maintenance equipment and machines can also contribute to the spread of granulates if there are no clear routines for parking, storage and cleaning.

Make sure there is a surface for cleaning machines and other equipment. The surface must be provided with wells where the granulates can be collected to prevent granulates from spreading to the waterways. Also the machines can be cleaned initially before leaving the fields where the majority of material possible clinging to the machines is removed from the machines when still on the field.

FIGURE 9 : EXAMPLE OF A FIELD WITH FENCES TO AVOID DISPERSION FROM VISITORS AND A DEDICATED AREA FOR CLEANING MAINTENANCE MACHINERY

Snow Dump area.

To minimise the spread of the granulates to the surrounding area, it is important that the granulates are collected after snow plowing and returned to the football field. Hard surfaces, where snow from the pitch can be dumped, shall be habilitated. When the snow melts, the granulates are easily returned to the pitch. A gravel area that is covered with ground cloth or a worn artificial turf can be a good alternative.

An overarching goal is to reuse granulates that are removed from the pitch during snow removal. Infill granulates that are put into the clearance zone and snow deposit area are considered clean and can be collected and returned to the pitch. There are several ways to do this, and there are systems which make it possible to return the infill to the pitch. The pitch owner is responsible for ensuring good routines and practical planning for proper infill handling.

Circular economy impacts of restricting rubbber granulates to be used in artificial turf

Rubber granulates have been found to have superior characteristics, much more trouble-free for those playing on the pitch. In addition, rubber granulates of recycled tyre material are relatively inexpensive compared to other filling materials, which means that more pitches can be built and more people will have the opportunity to play sports. From a life-cycle perspective, it has also been shown that it is more beneficial for the environment to use rubber granulates from worn-out tyres compared to other newly-produced filling materials (eg saving in CO_2 emissions). Cork has similar CO_2 emissions as SBR, but since one artificial turf requires 130 pitches of cork plantation, the land use that would be required becomes unsustainable.

SBR distinguishes itself from cork in agricultural land use. Cork takes up a lot of production space of equivalent to 130 football pitces of land are needed for the required amount of infill for a soccer field.

Just like SBR, cork provides little CO2 emissions. Cork oaks are good at binding CO2 and are in the biogenic cycle. But cork production mainly takes place in southern Europe. Transport from southern European countries is responsible for CO2 emissions (around 40% of SBR production). The suggestion that cork is the "environmentally friendly alternative" for SBR can therefore be disputed.

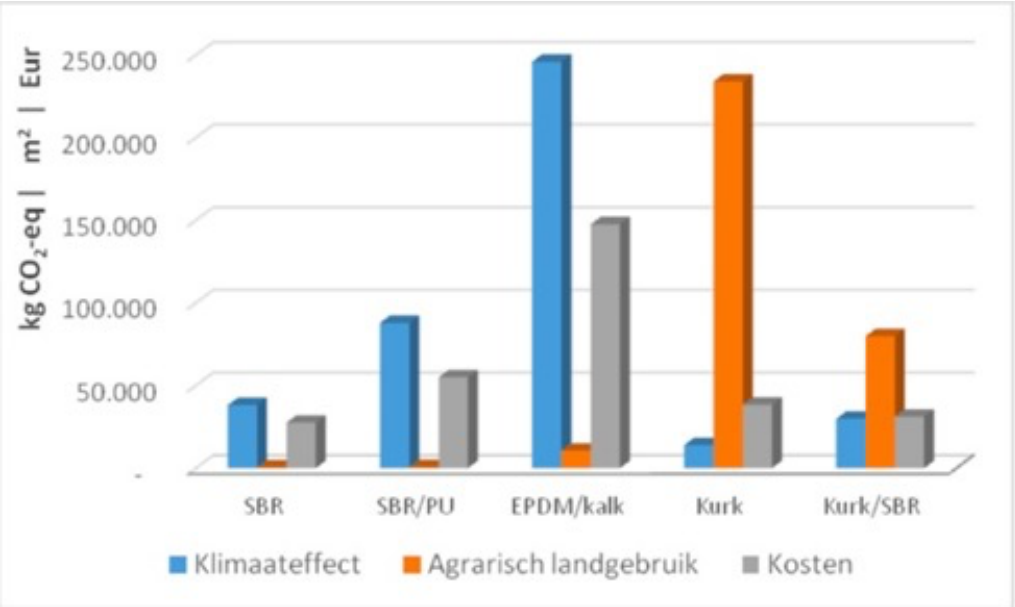

FIGURE 10 RESULTS OBTAINED USING THE LCA CALCULATION TOOL ECOTEST. MORE INFO ON ECOTEST.NU

European End of Life Tyre Market

In the table hereunder is represented the share of the different routes of End-Of-Life derived rubber in EU from the overall 2.99 million tonnes of Tyres processed. Noted that the 1.6 Million tonnes represent only the weight of the rubber fraction of the End-Of-Life tyres recovered. The total amount of Tyres recovered in weight is 2.99 million and it includes the rubber fraction, steel and textiles.

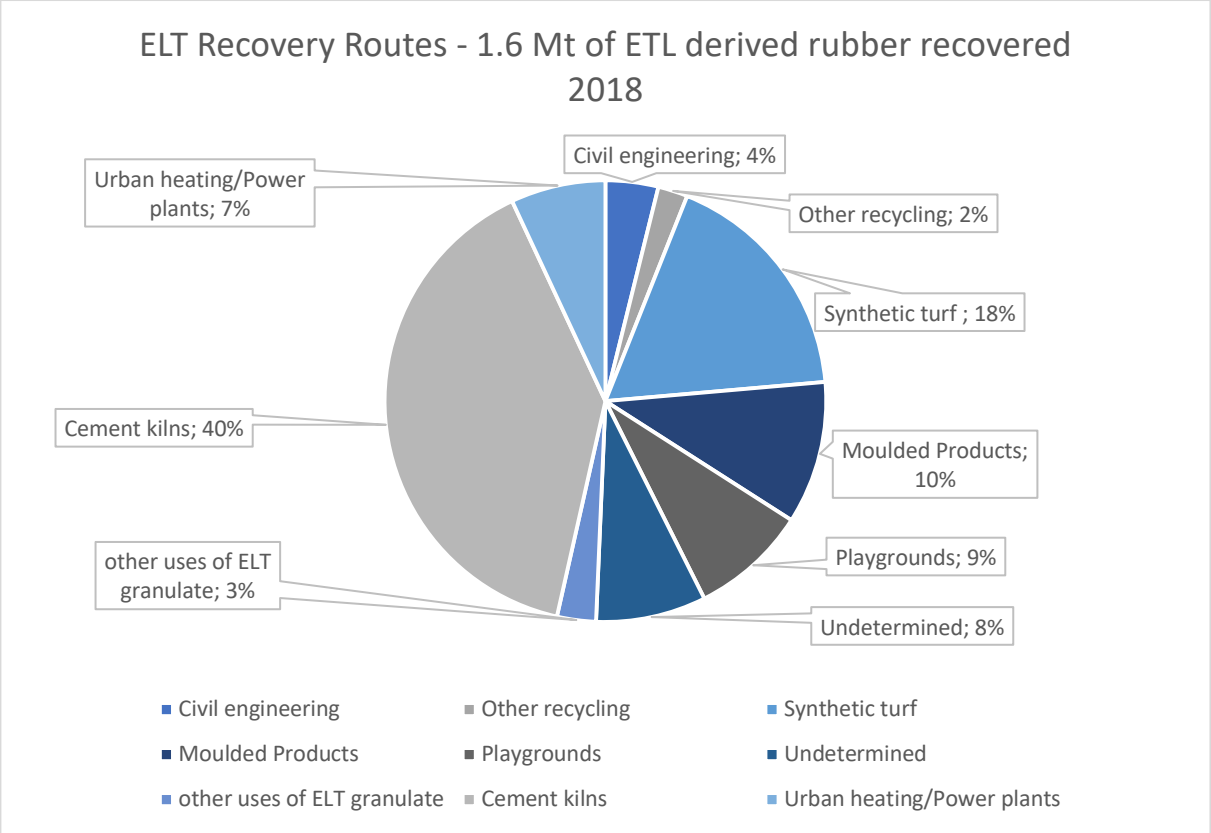

FIGURE 11: ELT EUROPEAN RECOVERY ROUTES 2018, SOURCE: ETRMA

Granulates for artificial turf, playgrounds, moulded products and powder meet the definition of microplastic as stabilised in Annex XV dossier proposal (note only rubber routes)

Granulation is essential for material recovery and recycling tyres

Material recovery of End-Of-Life Tyres derived rubber requires preparation steps and process the rubber in order to give the size required for next uses.
The most basic technology is processing ELT derived rubber and post-industrial rubber material into rubber chips that are typically 25 mm or larger. These chips are then used in tire-derived fuel and civil engineering projects. However, because of their relatively large size, these materials are not versatile or suitable for high-value applications. ELT derived rubber incineration routes do not require granulation and do not meet the definition of microplastics.

The two main routes to process ELT derived rubber for material recovery applications require granulation and therefore the production of microplastics as defined in the proposed Annex XV

Collecting and re-use

After serving as an infill in artificial turf the rubber infill is easily collected and can be used in new applications. This supports the possibility for circulate the material yet another round. If material total life times are extended by a factor 4,2 (same as the WWF factor of over-consuption of the planets resources) we may off-load the planet from virgin outtake.

Rubber Granulate Uses

The most common and wide spread use for ELT derived rubber material recovery is the production of rubber granulates. The typical sizes of granulation are SBR granulates, used for artificial turf and acoustic insulation (0,8 – 2,5 mm) and (2-4 mm) granulates, used for playgrounds and moulded products (2-4 mm). Both types of granulates meet the definition of microplastics as defined in the Annex XV proposal.
ELT for material recovery granulated in sizes that meet the definition of microplastics are used in the following applications:

- Artificial turf: ELT derived rubber is used to provide proper resilience and shock absorbance to the artificial turf pitches.
- Sport Surfaces/athletic tracks: ELT derived rubber can be used as underlayer in sports areas (volley, basket, etc). It is appreciated for its capacity to dissipate vibration and absorb impacts as well as to protect the muscle-skeleton apparatus of athletes.
- Shock absorbing pavements for children playgrounds: ELT derived rubber is used to produce shock-absorbing floorings for outdoor applications. ELT derived rubber is proven to be weather-resistant, permeable to water and durable vs. adverse effects.
- Moulded rubber goods: ELT derived rubber granulates and powders mixed with polyurethane binders are used to produce “re-moulded” rubber articles such as wheels for trolleys (e.g. caddies, dustbins wheelbarrows, etc.), urban furniture and safety corners among others.
- Civil Engineering: ELTs are used (whole or shredded) as lightweight material for embankments, water retention & infiltration basins, quarry relining, shore protection, etc.

The market outlets of recycled rubber differ from country to country and depends, for instance, on climate conditions, national legislation or the local/regional presence of cement plants. Figure 12 hereunder shows the evolution over the last years of the ELT-derived rubber granulate markets of granulation production in Europe.

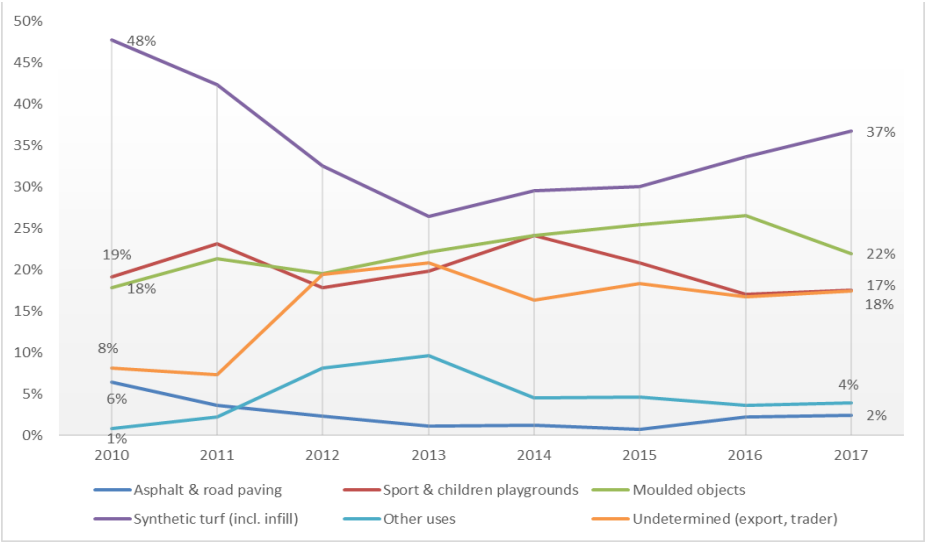

FIGURE 12 : EVOLUTION OF ELT GRANULATION MARKETS FOR ABOUT 20% OF THE GRANULATION PRODUCTION IN EUROPE, ETRMA.

The proposed microplastic restriction leads to the end of market of the rubber based infill market and affects the recycling routes of End-Of-Life Tyres

However, the current Annex XV restriction proposal bans the use of crumb rubber in sizes 0.8mm-2.5 mm for the use as infill material in synthetic turf fields, or any other infill such as equestrian floors. In the current Annex XV proposal, no exception is foreseen for that use.

To date there are no material recycling alternatives to compensate for the market loss of approximately 30% (input fraction) of the market share of ELT derived rubber of infill materials. As a result, 527.000 tonnes of ELTs would need to be used in other applications or into energy recovery.

The vast majority of the excess material will end up incinerated. If the proposed Annex XV is approved as such, provisions to increase the incineration capacity need to be considered to address this newly available incineration material.

Another side effect of the ban of ELT material as infill material in synthetic turf fields is the increase of exports outside Europe, losing a valuable raw material.

A measure like proposed in Annex XV dossier of banning the use of crumb rubber for infill applications shall be adequately justified and discussed. Any decision shall be based on all the socio and economic considerations, including hampering industry´s ability to support a circular economy.

At the proposed Annex XV restriction dossier the socio-economic impacts of the measure - banning crumb rubber for infill applications, are referred in page 80 of the Annex XV proposal, but there are not integrated in the calculation of the economic impacts and societal benefits**. We encourage to adequately address the impacts of the proposed measure, taking into account the environmental dimension and the socio-economic dimension.**

Conclusions

- Recycled tyre rubber granulate contributes to public health in a non-rivelled way compared to total environmental impact and land use.
- Recycled tyre granulate is safe
- First assesments of spread has been revised and real measuring has proven the levels that can leave the pitch if not correct measures are taken is 99,9% lower than first suspected.
- Recycled tyre granulate can to a small extent end up outside the football pitch but with easy measures this spread can be reduced to neglectable levels.
- The application supports circular economy and sound resource management
- Granulate can be collected from the pitch at the end-of-life and contribute to other applications.
- The total picture of risks and benefits to society shows that an **exemption from the restriction** of additionally added microplastics should be decided for the use of recycled tyre rubber as an infill to artifical turf.

Best practice guidelines across European countries

Further, there are available detailed guidance, best practices documents and national regulations that address dispersion from synthetic turf fields. Further, standardization activities are also foreseen. The CEN TC217 WG 6 TG1 Task Group has proposed to draft a technical report to promote and advocate best practice in support of EN 15330-1.

Hereunder a non-exhaustive list of reference documents:

- For the surrounding paved areas, use machinery as seen in this video: https://www.youtube.com/watch?v=7ScjV-RMPpQ
- RecyBEM and VACO. Verantwoorde toepassing van infill van voertuigbanden in kunstgras voetbalvelden. Adviezen voor invulling zorgplicht Wet milieubeheer (update 19 april 2017).
- Plan van aanpak - Opruiming en voorkoming van verspreiding van microplastics. BSNC, Gemeente Rotterdam, Gemeente Utrecht, Gemeente Amsterdam and Den Haag. 17 mei 2017.
- SVFF. Svenska Fotbollssförbundets rekommendationer för anläggning av konstgräsplaner 2018.
- Mera spel mindre spill, Ragn-Sells 2018.
- For the best practice: http://www.turfcleaner.no/ if you open this link and you click on the video at the top you will get a better understanding of how they intend to use the machine. The underneath mentioned video is more on the machine as such. https://www.youtube.com/watch?v=7ScjV-RMPpQ
- NFF. Vårklargöring av kunstgressbanen. Oslo 1 april 2018.
- NFF. Höstklargjöring av kunstgressbanen. Forslag til nye miljöforskrifter. Oslo 15 september 2018.
- NFF. Sommardrift av kunstgressbanen. Drift og vedlikehold av kunstgressbanen. Oslo 1 juni 2018.
- NFF. Vinterdrift av kunstgressbanen – i et helse- og miljöperspektiv. Oslo, 1 februari 2018.
- Forskningskampanjen 2017. Sjekk kunstgressbanen. Rapport fra undersökelser om svinn av gummigranulat fra kunstgressbaner, gjennomfört av over 12 000 elever og spillere hösten 2017. Conclusions in a power point presentation.
- Lega Nazionale Dilettanti. I campi da calcio in “erba artificiala”. Regolamento Standard approvato dalla C.I.S.E.A in data 28 novembre 2013.
- FIFA. Handbook of Requirements. FIFA Quality Programme for Football Turf. October 2015 Edition.
- BSNC: Simpele maatregelen om verspreiding microplastics van kunstgrasvelden te voorkomen. https://www.bsnc.nl/6257-2/
- ESTO Guidance Document - Minimising the risk of micro-plastic pollution. European Synthetic Turf Organisation. 2018
- EFFECT OF MAINTENANCE ON INFILLS RE-FILLING QUANTITIES ALONG FIELD USAGE LABORATORY STUDY WITH LISPORT XL. Sport Surfaces Research and Development Infill Material for Synthetic Turf. Report nr R181331-A1, 19-12-2018, Order from Genan.
- Hanne Lökkegaard, Björn Malmgren-Hansen and Nils H. Nilsson. Massebalancer af gummigranulat, som forvinder fra kunstgreasbaner med fokus på unledning til vandmiljöet. En litteraturgennemgang. Teknologisk Institut. Reviderad version 2019.

- Want the most sust. Solution? Add Genan - add value. A Power Point Presentation from ESTC meeting – Microplastic. Date 30-04-2019.
- Marte Haave . Artificial turf granulates from football fields. NORCE, Norwegian Research Centre AS. A power point presentation.
- Madeleine Berg. Keep the plastic on the pitch. Promoting best practice to reduced microplastic loss. FIDRA and KIMO. A power Point presentation.