



ESTC INFILL GUIDANCE DOCUMENT



2025 EDITION

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CONTEXT OF THE DOCUMENT

ESTC identified the need to develop a document to address the complexity involved in designing a turf system and the variety of infill solutions available.

This document aims to explore the intricate nature of turf system design, emphasizing the critical role of infill selection has on the properties of the system. Additionally, it seeks to establish a clear pathway for stakeholders to connect with suppliers, facilitating the exchange of detailed information about available infill options.

This initiative was deemed essential due to recent developments including restrictions on commonly used polymeric infills by the European Commission.

Additionally, ongoing work within the industry, particularly the revisions to CEN standards over the past few years have resulted in the development of new test methods and standards.

Notably, the draft **prEN 15330-5:2024 (Surfaces for sports areas - Synthetic turf and textile sports surfaces - Part 5: Specification for infill materials)**.

INTRODUCTION

BENEFITS OF SYNTHETIC TURF SPORTS SURFACES

Synthetic turf sports surfaces offer high-quality, cost-effective facilities capable of withstanding heavy usage and thriving in regions where natural grass cannot be grown or maintained effectively.

EVOLUTION OF SYNTHETIC TURF: THE RISE OF 3G SYSTEMS

Since the early 2000s, third generation (3G) (long-pile) synthetic turfs have gained significant popularity. Designed to mimic the playing characteristics of natural grass, these surfaces have become widely adopted by sports such as football and rugby.

THE ROLE OF PERFORMANCE INFILL

A critical element of long-pile synthetic turf systems has traditionally been the performance infill. This material helps keep the turf fibers upright while providing essential sports performance characteristics. The most commonly used performance infill has been rubber granulate derived from end-of-life tyres, favored for its low cost, durability, and properties that enhance player comfort and performance in all weather conditions.

ENVIRONMENTAL CONCERNS AND REGULATORY CHANGES

In recent years, environmental concerns have highlighted the migration of polymeric granulate (infill) as a possible source of intentionally added microplastic pollution. In response, the European Union⁽¹⁾ has introduced a ban on the sale of such materials starting on 17 October 2031. This heightened environmental awareness and impending ban have led synthetic turf manufacturers to seek alternative solutions, resulting in the introduction of new surface configurations and alternative infill types.

CHALLENGES FOR PURCHASERS

These changes have created challenges for purchasers of synthetic turf sports fields, as they now need to evaluate and select from unfamiliar surface options, some of which have not been fully validated. Given the substantial investment required and the expectation that a synthetic turf sports field will perform adequately for at least ten years, choosing the most appropriate new surface type is crucial to ensuring a successful and sustainable sports facility.

PURPOSE OF THIS DOCUMENT

This document has been prepared to support the client in making an informed decision and asking the right questions to suppliers to ensure they get the best option for their requirements.

(1) EU Regulation amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and Council; concerning the Registration, Authorization and Restriction of Chemicals (REACH) as regards synthetic polymer microparticles

POINTS TO CONSIDER

Selecting a synthetic turf surface involves evaluating numerous factors, with the choice of infill being just one key consideration. A turf system is composed of various other components, or “ingredients,” including yarns, yarn combinations, turf carpet construction, shockpads, base layers, and more.

For example, Infill A may perform exceptionally well when paired with a high-density yarn design and a shockpad but may not perform as effectively in a system with low yarn density and no shockpad. This highlights the importance of selecting the right infill in combination with an appropriate turf system.

The impending ban on sale of polymeric infills classified as intentionally added microplastics has significantly accelerated the pace of change in the industry, leading to market confusion and differing opinions on the best solutions.

To navigate this complexity, it is essential to consult with turf system designers and material suppliers. They can provide expert guidance and ensure you select the most suitable solutions for your needs.

Below is a range of topics and inquiries to guide your decision-making process. As you evaluate surfacing options for your project, reflect on the following:

1. INTENDED FIELD USE AND COMPETITION LEVEL

What is the intended use of the field and what level of competitions will be played on the field?

When selecting a synthetic turf system for your field, it is important to consider the various certifications, programs, and classifications that can be achieved with different systems. Evaluate the specific certifications required for your field and consult with a system supplier to guide you in making the best choice.

- What are the primary applications of the field?
- Are there any secondary applications?
- What level of competition will it be used for?

There are many different regional criteria and requirements, and these can be a starting point for turf system selection.

Manufacturers of synthetic turf surfaces aim to design solutions that prioritize player performance, comfort, providing adequate durability, and ensuring proper maintenance throughout the system's lifecycle.

Additionally, consider the certification levels of the materials that make up the turf system. In recent years, new standards have been developed for key components such as infill and shockpad materials. These standards evaluate performance characteristics and provide parameters to guide material selection.

For shockpads, the relevant standard is EN 15330-4:2022 - Surfaces for sports areas - Part 4: Requirements for shockpads.

For infill materials, the most recent standard, prEN 15330-5:2024 - Surfaces for sports areas - Part 5: Specification for infill materials, is currently being finalized.

Careful consideration of these standards and certifications will help ensure that the system you select meets the necessary performance and safety requirements for your specific application.

2. SURFACE MAINTENANCE NEEDS

What maintenance requirements should be followed? What level of maintenance will the selected surface require and are you able to commit to providing this?

IMPORTANCE OF PROPER MAINTENANCE

Correct maintenance of synthetic turf surfaces is essential to ensure optimal performance, consistency, permeability, longevity, and other critical factors. Adhering to the recommended maintenance practices is also a key condition for preserving the warranty provided by the manufacturer or supplier, making it a vital aspect that should not be overlooked.

MANUFACTURER AND SUPPLIER GUIDELINES

Manufacturers or suppliers should provide detailed maintenance guidelines, including specifications for equipment, conditions for interventions, and procedures for maintaining the field. It's important to note that maintenance requirements can vary depending on the materials used, the system design, the location, and the field's usage patterns. For example, maintenance needs will differ significantly between cold regions with heavy snowfall and warmer, drier climates.

INFILL MAINTENANCE REQUIREMENTS

Infilled synthetic turf systems require periodic addition of infill materials (otherwise known as topping-up) to maintain performance and account for compaction and displacement. The required frequency and quantity of additional infill will depend on the type of infill, the turf system in place, and the amount of field usage. When selecting an infill, consider the specific needs of your geography and plan for potential additional material requirements.

ALTERNATIVES TO INFILL-BASED SYSTEMS

For your information, alternative systems to infill-based solutions are available on the market. These systems, commonly known as "non-filled" systems, do not require infill.

CONSULT YOUR SUPPLIER

Always consult your system or component supplier for tailored maintenance guidelines to ensure the longevity and performance of your synthetic turf surface.

ESTC has an **Interest Group for MAINTENANCE** that can be used for additional discussion and sharing of best practices for ESTC members.

3. FIELD USAGE FREQUENCY

How much use will the field receive each week/month/year?

ADVANTAGE OF SYNTHETIC TURF FOR INTENSIVE USE

One of the key advantages of synthetic turf is its ability to sustain prolonged and intensive use without the need for recovery periods, unlike natural grass, which requires downtime to regrow and recover from heavy foot traffic. Synthetic turf systems are designed to provide consistent performance across long hours of play, making them an ideal choice for facilities that cater to high-frequency events or a wide range of users year-round. This increased availability means more games, practices, and events can take place, maximizing the return on investment and meeting the needs of busy sports facilities.

FACTORS AFFECTING FIELD WEAR AND USAGE

When evaluating how much use a synthetic turf field will endure, it's crucial to consider the frequency it is used—typically measured in hours per week. Heavy usage can accelerate wear on system components such as turf, infill, and shockpads. Additionally, seasonal variations, weather conditions, and multi-purpose use, such as accommodating several teams or hosting community events, also influence how quickly the field may degrade.

SELECTING THE RIGHT TURF SYSTEM FOR USAGE LEVELS

When selecting the appropriate synthetic turf system, consider the expected usage levels, the types of activities conducted, and the maintenance required to ensure durability. The industry standard includes criteria to simulate wear for the system and its components. These can guide decision-making, but it's also helpful to consult suppliers for recommendations and review case studies of systems in similar usage scenarios.

MAINTENANCE PLANNING TO MAXIMIZE LIFESPAN

To maximize the lifespan and usability of a synthetic turf field, a regular maintenance schedule is essential. Proactively planning for peak usage times, such as sports seasons, and using off-seasons for restorative maintenance can help distribute wear more evenly throughout the year. By combining these strategies with the inherent durability and high-use capacity of synthetic turf, facilities can enjoy a reliable, cost-effective surface that supports a wide variety of activities year-round, and for many years.

4. BEST INFILL FOR YOUR CLIMATE

What is the local climate in your region, will some types of infill be better suited than others?

IMPORTANCE OF LOCAL CLIMATE IN INFILL SELECTION

The local climate is a critical factor in determining the most appropriate type of infill for a synthetic turf field. Different weather conditions can significantly impact the performance, safety, and longevity of the turf system, making it essential to choose a material that aligns with the specific environmental challenges of the region.

CONSIDERATIONS FOR COLD CLIMATES

In cold climates, turf systems and infills that resist freezing and maintain performance in wet or icy conditions can significantly enhance player safety and field usability. Systems that can withstand cold conditions should be selected.

CONSIDERATIONS FOR HOT AND ARID CLIMATES

In hot and arid climates, certain infills may absorb and retain excessive heat, leading to uncomfortably high surface temperatures for players. In such cases, heat-resistant infill options that stay cooler under intense sunlight may be more suitable.

CONSIDERATIONS FOR WET CLIMATES

In regions with heavy rainfall or frequent storms, the focus should be on systems and infill combinations that offer efficient drainage to prevent waterlogging and ensure safe playing conditions. Additionally, it is important to ensure that lightweight and mobile infills do not migrate from the field, which would require substantial remediation on a regular basis.

CONSIDERATIONS FOR HIGH UV EXPOSURE

Similarly, regions with high UV exposure require infills that can withstand prolonged sunlight without degrading, ensuring the field's longevity and consistent performance.

BENEFITS OF CLIMATE-SPECIFIC INFILL SELECTION

By carefully evaluating these climate-specific factors, facilities can select an infill that not only withstands environmental challenges but also maintains optimal performance, safety, and durability throughout the different seasons for many years. This tailored approach reduces long-term maintenance costs and enhances the overall value of the synthetic turf system, providing a reliable and high-performing surface for extended periods.

5. COMMITMENT TO MAINTENANCE COSTS

Are you able to set aside the necessary funding to allow for the ongoing maintenance, and periodic topping up or replacement of the infill?

IMPORTANCE OF MAINTENANCE FUNDING

Allocating adequate funding for ongoing maintenance and periodic replenishment or replacement of the infill is essential to maintaining the performance, safety, and longevity of your synthetic turf field. Regular use over time can cause infill displacement and compaction, diminishing its ability to provide proper shock absorption and traction. Routine maintenance activities such as grooming, brushing, and redistributing the infill are critical to ensuring consistent field performance and extending its lifespan.

IMPACT OF ENVIRONMENTAL FACTORS

Environmental factors such as rain, wind, and UV exposure can also accelerate infill degradation or displacement, increasing the frequency of replenishment needs. Periodically, typically once per year, more intensive maintenance-such as topping up or replacing infill-may be necessary to maintain optimal playing conditions and player safety.

FINANCIAL PLANNING FOR MAINTENANCE

Proactive financial planning for these needs, including setting aside sufficient funding for maintenance, helps to prevent unexpected, costly repairs and keeps the field in excellent condition throughout its lifecycle. Maintenance budgets should include the cost of specialized equipment, labor, and periodic inspections to assess wear and ensure the system remains in optimal working order.

SELECTING THE RIGHT INFILL

Selecting an infill that matches the specific climate and usage conditions of your field is equally important. Certain infill types are better suited to specific environments or usage patterns. Refer to relevant European Standards, such as prEN 15330-5:2024, and consult your infill and system supplier for detailed guidance on wear capacity and replenishment schedules. By carefully considering these factors, you can ensure your synthetic turf field remains high-performing, durable, and well-maintained over time.

6. LOCAL INFILL PERFORMANCE

Has the infill that is being considered proven to be an acceptable solution in fields in your region or regions of similar behavior?

PROVEN PERFORMANCE IN LOCAL CONDITIONS

When selecting an infill for a synthetic turf field, it is crucial to choose a material that has been tested and proven to perform well in your specific region or under similar conditions. Factors such as climate and the type of sports activities conducted on the field can all significantly influence the long-term performance of the infill.

CLIMATE AND ACTIVITY CONSIDERATIONS

For instance, certain infills may be specifically designed to withstand high temperatures or manage heavy rainfall effectively, while others may not perform as well in similar conditions. Consulting with local experts or reviewing existing installations in your area can provide valuable insights into how particular infills perform over time. If a specific infill has been successfully used on nearby fields with similar conditions, it is a good indication that it could be a suitable choice for your project. However, always consult with your system and/or infill supplier, as the overall turf system, not just its individual components, plays a critical role in determining the final outcome.

REGULATORY AND ENVIRONMENTAL REQUIREMENTS

Additionally, local regulations or environmental standards may influence your choice of infill to ensure compliance with safety, environmental, and sustainability requirements. Consider criteria such as fire resistance, environmental impact, and the sustainability benefits of the material. Taking these factors into account will help you select an infill that meets both performance and regulatory expectations for your synthetic turf field.

7. KEY CONSIDERATIONS WHEN CHOOSING INFILL

There are many different infills considered in the market, from synthetic to organic.
When selecting a target system, which points should be considered?

When selecting a turf system, it is important to consider a variety of factors, including performance, comfort, climate compatibility, maintenance requirements, commonly used infills in the market, and the environmental impact. These considerations, along with the recommendations and context outlined in this document, will help ensure an informed decision.

SELECTION CRITERIA	DESCRIPTION / KEY QUESTIONS
Origin and Types	What types of infills are available, how do they differ, and where are they sourced?
Market Availability	Are the selected infill types readily available in your region or globally?
Environmental Considerations	What are the environmental benefits of the infill, and how does it impact sustainability?
Technical Advantages/Disadvantages	What are the primary technical strengths and weaknesses of each infill type?
Previous Applications	Where have these infills been successfully used, and in what conditions?
Durability	How do the infills respond to potential challenges, such as environmental or mechanical stresses, over time?
Compliance with Standards	Are the infills certified according to relevant European Standards?
Life Cycle Considerations	Have the infills undergone a Life Cycle Assessment (LCA or PEFCR), and what are the considerations for recycling them?
Reusability	Can the infills be reused after the turf system's lifespan?
End-of-Life Recycling	What processes are in place to recycle the infills after their lifecycle ends?

7. KEY CONSIDERATIONS WHEN CHOOSING INFILL

Taking these points into account will not only help in selecting a turf system with infill that aligns with performance and safety requirements but also supports sustainability and compliance with regulatory standards.

Always collaborate closely with your system suppliers to ensure the chosen solution is well-suited to your project's needs.

Below a link is shared with contacts of ESTC members, where you can find system, infill and shockpad suppliers that you should contact in case of any questions or support:

<https://estc.info/member-directory-search/>