DUALSPORT PITCHES FOR FOOTBALL AND HOCKEY

Performance and construction guidelines

PREPARED BY

FIFA® | FIH


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Contents

01. Introduction 5

02. Use of DualSport football pitches/hockey fields 6

03. What type of turf is laid on a DualSport pitch? 7

04. Selecting a high-quality DualSport turf for your pitch 8

05. Pitch layouts 10

06. Pitch performance and construction criteria 12

Annexe A: DualSport turf quality criteria 17

Disclaimer 20


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01. Introduction

Football, field hockey and other team sports have embraced the benefits that synthetic-turf pitches bring to their sports. The surfaces provide consistent and safe playing conditions that can accommodate much more frequent use, in a much wider range of weather conditions, than natural-grass fields. For many, a synthetic-turf pitch is the only way of meeting the sporting needs of their community. At higher levels of competition, FIFA, the International Hockey Federation (FIH) and other international sports federations have developed standards that define the qualities required of the pitches that their sports are played on. These requirements are often incorporated into competition regulations and also form the basis of the following quality programmes:

- FIFA Quality Programme for Football Turf (FIFA Quality Programme)
- FIH Quality Programme for Hockey Turf (FIH Quality Programme)

Reflecting the intended use, these standards are based on surfaces and sports pitches that will be used exclusively or primarily for one sport. But at community and educational levels of sport, there is often a need to play two or more sports on a single pitch.

This guide has been produced to assist those wishing to build pitches that will be used for football and hockey. It defines how such pitches should perform and the appropriate construction criteria they require. These guidelines are based on the FIFA Basic quality mark and the FIH Hockey Turf Multi-Sport Category.

NB: The FIFA Basic standard is an installation certification scheme and not a product approval scheme. FIFA Basic certification does not include any laboratory product testing that would ensure the quality of the system prior to its installation, nor does it include the assessment of the materials installed (carpet, fibres, infills or shockpad). FIFA Basic certification only recognises the very minimum performance of the playing surface for football and does not guarantee the durability of the system installed.

02. Use of DualSport football pitches/hockey fields

As the sports performance properties of multisport pitches are a compromise that seek to meet the demands of more than one sport, they may fail to meet the expectations and needs of elite players and high-level competitions. The pitches will also have multiple line markings that some competition regulations prohibit. Table 1 shows the levels of football and hockey that are often played on multisport pitches.

It is also envisaged that DualSport football pitches/hockey fields will also be suitable for other sports like Lacrosse and American football, but guidance from the relevant sport's governing body should always be sought first.

Table 1: Levels of sport that are often played on football pitches/hockey fields

Grassroots and community hockey	✓	Entry-level school, university and club hockey	✓
Grassroots and community football	✓	Entry-level school, university and club football	✓

03. What type of turf is laid on a DualSport pitch?

Football should ideally be played on longer-pile synthetic-turf surfaces that replicate natural grass, whereas hockey is more suited to the speed and consistency provided by shorter-pile synthetic-turf surfaces. Both sports have to make compromises when it comes to finding a balance between these conflicting priorities. Turfs that achieve this will typically have a pile height of 30mm-45mm, with the pile being made from either (texturised) curly yarns or a mixture of curly and straight yarns. To ensure that a hockey ball does not sink into the pile, the tuft density is normally greater than that of football-specific synthetic-turf surfaces. The pile may either be partly filled (dressed) or non-filled.

NB: Neither FIFA or the FIH intend to restrict how football/hockey turf is designed – the key consideration is its ability to facilitate the desired performance, as detailed in this guide.

To provide the desired playing characteristics, the turf will normally be laid over a shockpad. These may either be manufactured as rolls or tiles or be mixed and paved on-site to form a continuous underlayer.

Figure 1 illustrates a typical surface.

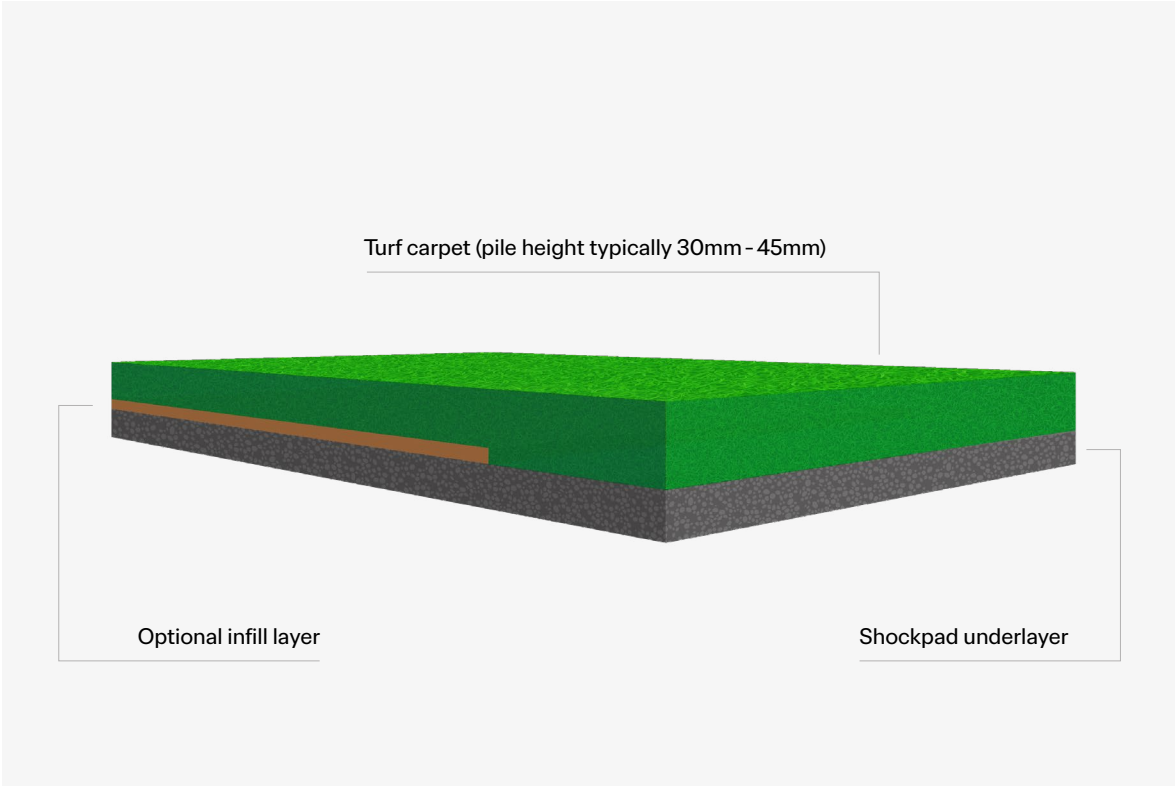

Figure 1: Typical turf construction for a football pitch/hockey field

04. Selecting a high-quality DualSport turf for your pitch

Selecting the best synthetic-turf surface for a pitch can be a challenging process. You need to ensure that the surface has the desired playing characteristics, provides adequate protection and comfort to the players and is of sufficient quality to withstand frequent use and harsh weather conditions.

To minimise the risk of selecting a surface that may not have the desired playing qualities or be able to provide the life expectancy that most pitch owners expect, it should be tested in the laboratory before being brought to market to demonstrate its quality. Annexe A details the quality levels that FIFA and the FIH believe are appropriate. The criteria are based on the internationally recognised quality standards developed by the respective federations.

NB:

1. Surfaces complying with the criteria detailed in Annexe A and produced by members of the FIH Quality Programme qualify for FIH approval.

2. The FIFA Basic quality mark does not include laboratory product assessment criteria.

3. Whenever a product is tested in the laboratory, a series of product identification tests should also be undertaken to ensure that materials delivered to a pitch are of similar quality to those previously tested. Both the FIFA Quality Programme and the FIH Quality Programme provide guidance on what should be tested and the acceptable results of such testing.

05. Pitch layouts

Figure 2 shows a typical layout of a DualSport pitch. To minimise the number of line markings, common side and end lines are often used, meaning the field of play measures 91.4m x 55m (100yd x 60.15yd). This size complies with The IFAB's Laws of the Game and the FIH's Rules of Hockey. The size of the pitch is, however, smaller than that often used for football-specific pitches. Run-offs should be at least 3m wide on each boundary.

The yellow lines represent markings unique to hockey fields. The white lines represent football pitch markings and those which are used for both football and hockey.

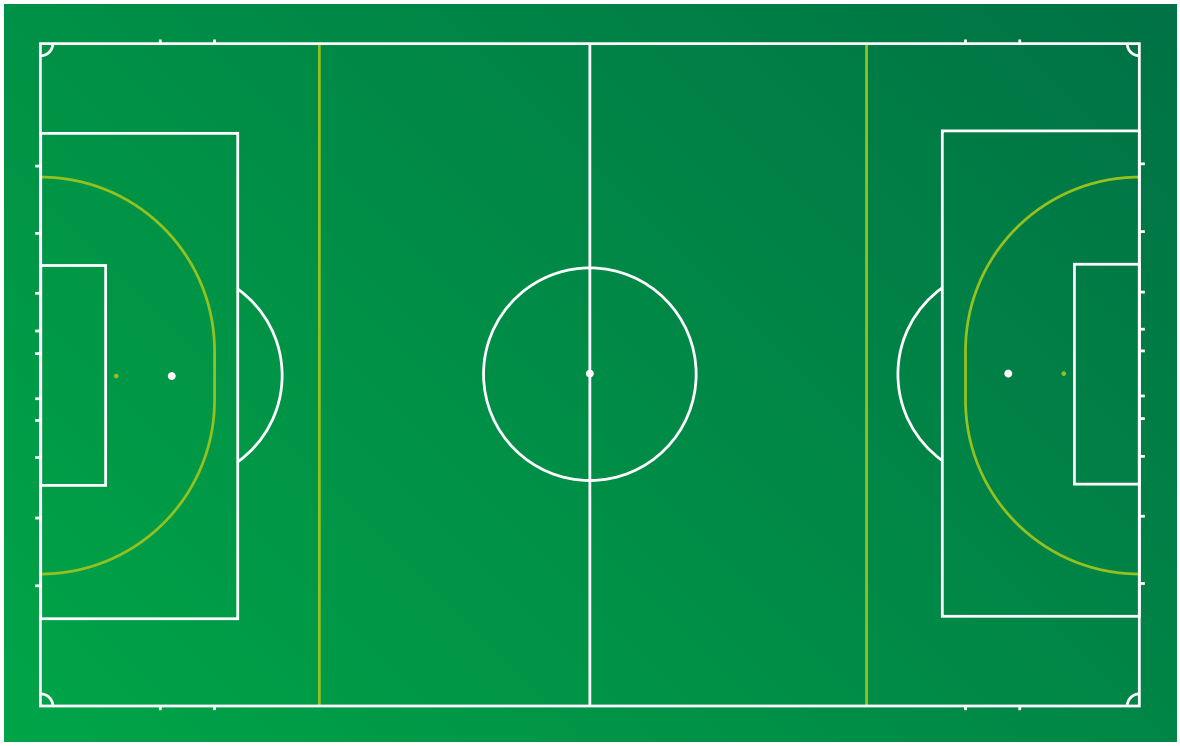

Figure 2: Typical layout of a football pitch/hockey field

Figure 3 shows a typical five-a-side football pitch and Hockey5s field. The playing area measures 40m x 23.76m. Run-offs should be at least 3m wide on each boundary. Additional space at each end of the pitch should be provided so that goals may be safely stored when not in use.

The five-a-side football penalty areas have a radius of 6m.

Penalty spots are positioned at 6m (five-a-side football) and 6.4m (Hockey5s) from the goal line, with a diameter of 150mm.

The centre circle has a diameter of 2.5m.

The Hockey5s playing area should ideally be defined by portable Hockey5s rebound boards. Where this is not possible, the five-a-side football markings may be used.

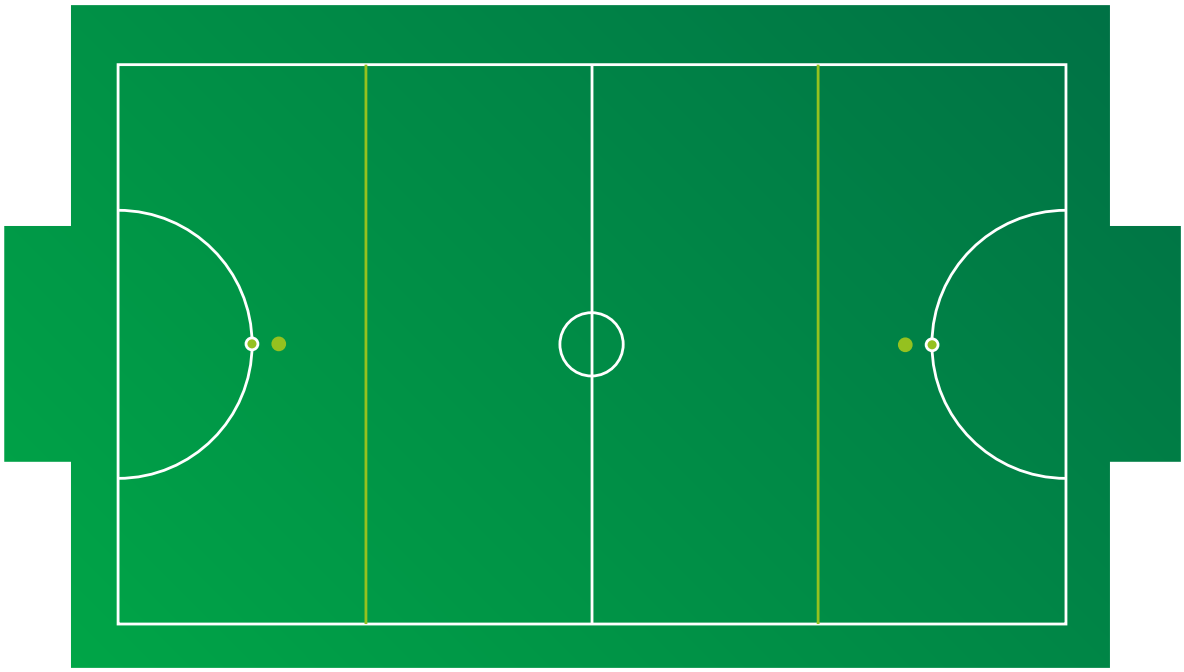

Figure 3: Typical layout of five-a-side football pitch/Hockey5s field

06. Pitch performance and construction criteria

Ensuring a pitch meets appropriate performance standards is essential for player welfare and playing performance. Poorly built or maintained pitches are unlikely to meet the expectations of players or pitch owners and may deteriorate at a faster rate than normal.

Pitches should generally be designed and constructed in accordance with the FIFA Code of Practice for the Design, Construction and Testing of Football Turf Fields.

Pitches are typically tested upon completion to verify that they have been constructed to the relevant quality standards and then periodically throughout their service lives. The frequency of testing will depend on the certification requirements.

Table 2 details the performance criteria recommended for DualSport football pitches/hockey fields. Pitches complying with these criteria qualify for FIFA and FIH certification.

NB:

1. The upper limits for peak shock absorption and peak deformation have been reduced from those specified in the FIFA Basic standard due to hockey's preference for a slightly firmer surface.

2. Consistency compares the variation between the overall mean value for all of the test positions to the result obtained at a specific location.

Table 2: Pitch performance and construction standards

Table 2.1: Sports performance properties

		Test method	Requirement	Consistency
Football performance	Ball rebound (optional)	FIFA TM 01	60cm-115cm	± 10% relative
	Ball roll (optional)	FIFA TM 01	≤ 15m	± 3m absolute
	Ball roll deviation (if ball roll tested)	Visual assessment	Ball to roll in a straight line	
Hockey performance	Ball rebound	FIH HT&FS Part 2	10cm-50cm	± 20% absolute
	Ball roll	FIH HT&FS Part 2	≥ 7m	± 20% absolute
	Ball roll deviation	FIH HT&FS Part 2	≤ 0.40m @ 7.5m	
Player-surface interactions	Peak shock absorption	FIFA TM 03	55%-65%	± 10% absolute
	Peak deformation	FIFA TM 04	≤ 14mm	± 4mm absolute
	Football boot peak torque	FIFA TM 05	25Nm-50Nm	± 7Nm absolute
	Hockey shoe rotational resistance	EN 15301-1 dimple test sole	25Nm-45Nm	± 5Nm

Table 2.2: Construction criteria

Pitches should generally be designed and constructed in accordance with the FIFA Code of Practice for the Design, Construction and Testing of Football Turf Fields

Field of play dimensions (11-a-side pitches)	Hockey	91.4m x 55.0m
	Football	The IFAB's Laws of the Game permit pitch dimensions of up to 120m x 90m
	Run-offs	≥ 3m on each boundary
Field of play dimensions (Small-sided football/ Hockey5s)	Recommended	40m x 23.76m
	Length	Max. 48m, min. 32m
	Width	Max. 35m, min. 18m
	Run-offs	≥ 3m on each boundary
Turf installation	There must be no installation defects that pose hazards to players or match officials, or adversely affect the playing qualities of the pitch	
Line markings	Football	As per The IFAB's Laws of the Game
	Hockey	As per the FIH Rules of Hockey Dashed 5m circle lines are not required
Surface regularity of playing surface	FIFA TM 08	≤ 6mm using a 3m straight edge for testing
Water permeability	EN 12616	≥ 150mm/h
Infill containment barriers	Recommended for all pitches using polymeric infill materials	

Test positions

11-a-side pitches

11-a-side pitches should be tested at the positions shown in Figure 4.

Ball rebound, ball roll and ball roll deviation (for both football and hockey), peak torque (for football) and rotational resistance (for hockey) should be measured at positions 1-6. Ball roll and ball roll deviation tests should be carried out in four directions (0°, 90°, 180° and 270°) with three individual measurements in each direction.

Peak shock absorption and peak deformation should be measured in positions A-S.

If the client commissioning the tests is concerned about the performance of particular areas of the pitch, they may ask the test institute to carry out additional tests in those areas.

Surface regularity should be assessed in accordance with FIFA Test Method 08. All deviations greater than 6mm should be recorded on a site plan at the relevant positions. It should be made clear whether the deviation is too high or too low.

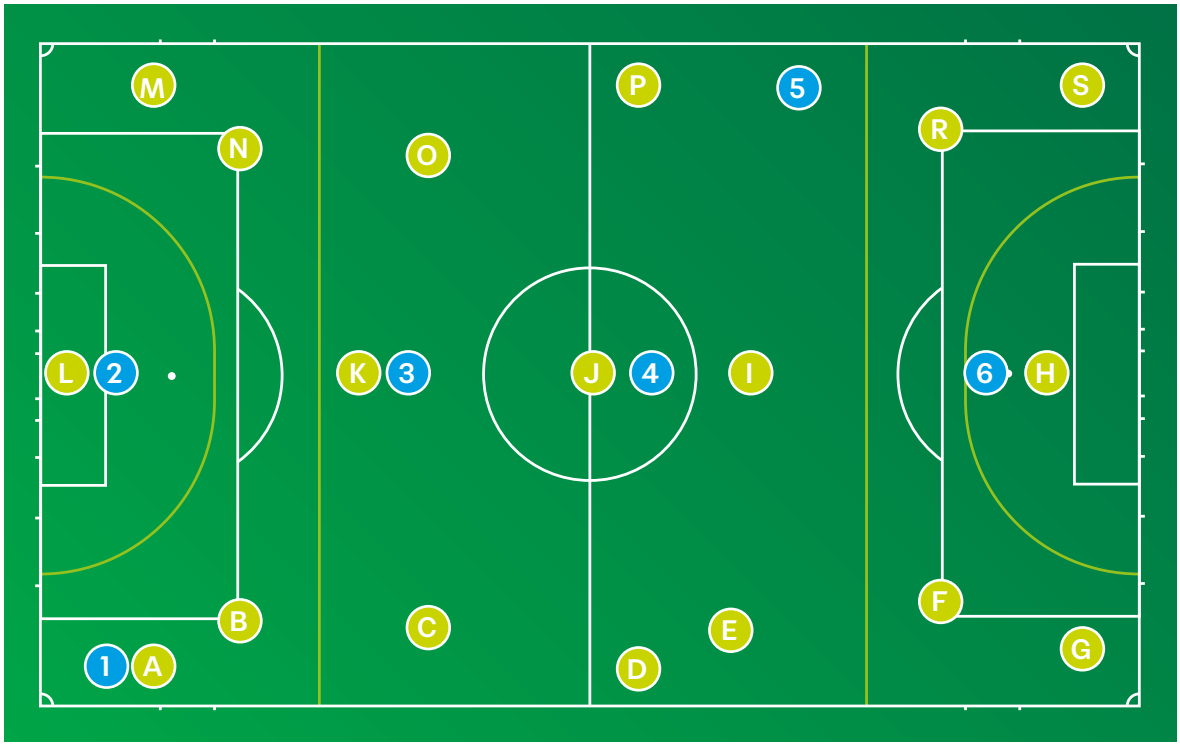

Figure 4: Field test positions (full-size pitches)

Five-a-side football/Hockey5s pitches

Small-sided pitches should be tested at the positions shown in Figure 5.

Ball roll and ball roll deviation tests should be carried out in four directions (0°, 90°, 180° and 270°) with three individual measurements in each direction.

Surface regularity should be assessed over the whole area.

If the client commissioning the tests is concerned about the performance of particular areas of the pitch, they may ask the test institute to carry out additional tests in those areas.

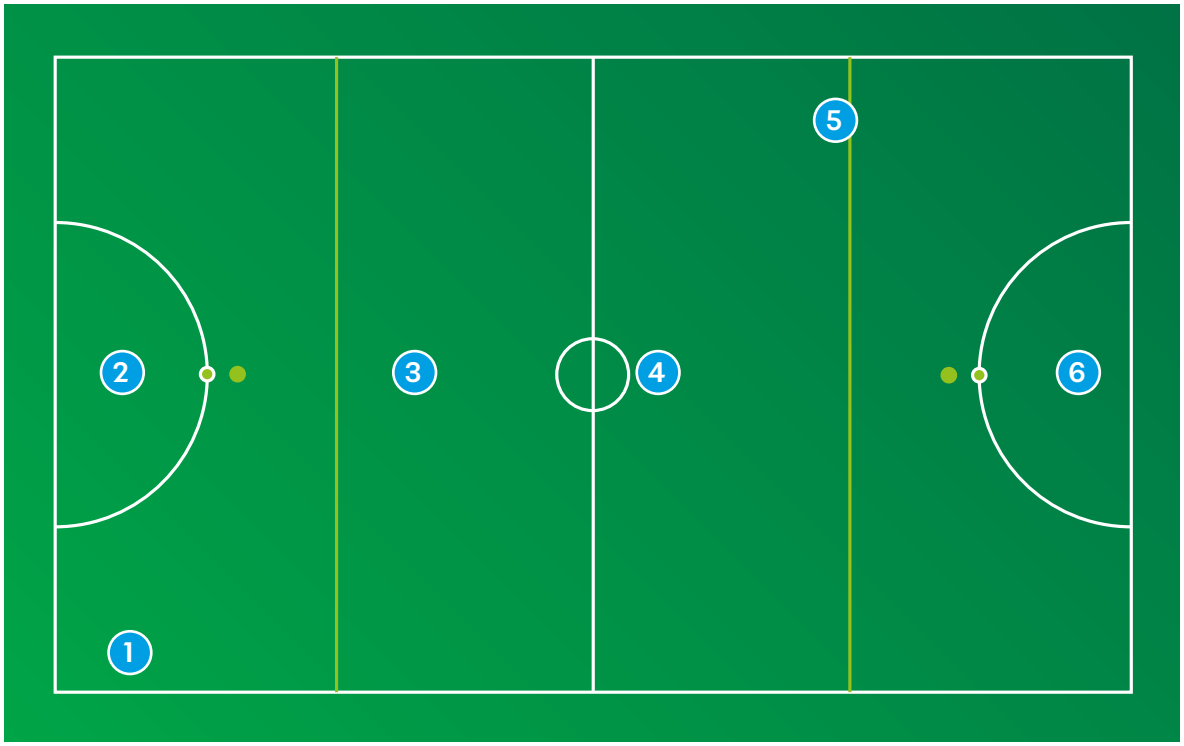

Figure 5: Field test positions (small-sided pitches)

FIFA and FIH pitch certification

Pitches requiring certification by FIFA and or the FIH must be tested by an institute accredited by the relevant federation, and the field tests must be carried out as described in the current edition of the FIFA Quality Programme for Football Turf – Test Manual II: Test requirements and/or the FIH Hockey Turf and Field Standards.

Formal reporting for accreditation must be undertaken in accordance with the requirements of FIFA or the FIH.

For fields requiring FIH certification, product identification tests should also be undertaken when a field is first tested to verify that the installed turf surface is the same as that previously approved by the FIH.

Annexe A: DualSport turf quality criteria

Table A.1: Sports performance properties

	Property	Test method	Condition	Requirement
Football performance	Ball rebound	FIFA TM 01[1]	Dry, wet and after simulated wear[3]	60cm-115cm
	Ball roll	FIFA TM 02a[1]	Dry, wet and after simulated wear[3]	≤ 15m
Hockey performance	Ball rebound	FIH Clause 5.1.1[2]	Dry, wet and after simulated wear[3]	10cm-50cm
	Ball roll	FIH Clause 5.1.2[2]	Dry and after simulated wear[3]	≥ 7m
Player-surface interactions	Peak shock absorption	FIFA TM 03[1]	Dry, wet and after simulated wear[3]	55%-65% FR
	Peak deformation	FIFA TM 04[1]	Dry, wet and after simulated wear[3]	≤ 14mm
	Football boot peak torque	FIFA TM 06[1]	Dry, wet and after simulated wear[3]	25Nm-50Nm
	Hockey shoe rotational resistance	EN 15330-1 using dimpled test sole	Dry, wet and after simulated wear[3]	25Nm-50Nm

NB:

1. As described in the FIFA Quality Programme for Football Turf – Test Manual II: Test requirements.
2. As described in the FIH Hockey Turf & Field Standards Part 1 – FIH Approved Hockey Turfs.
3. Simulated wear is created using the Lisport XL apparatus, as described in FIFA TM 13 (6,000 cycles should be carried out).

Table A.2: Material quality and durability

<table>
<tr><th>Component</th><th colspan="2">Property</th><th>Test method</th><th colspan="3">Requirement</th></tr>
<tr><td>Turf system</td><td colspan="2">Water permeability</td><td>EN 12616</td><td colspan="3">≥ 150mm/h</td></tr>
<tr><td rowspan="8">Synthetic-turf pile yarns</td><td colspan="2" rowspan="3">Tensile strength</td><td rowspan="3">EN 13864</td><td rowspan="2">Monofilament and monotape yarns</td><td>≤ 1200dtex</td><td>≥ 5N</td></tr>
<tr><td>≥ 1200dtex</td><td>≥ 8N</td></tr>
<tr><td>Fibrillated yarns</td><td colspan="2">≥ 30N</td></tr>
<tr><td rowspan="5">Resistance to artificial weathering</td><td>Artificial weathering</td><td>EN14836 Method 2</td><td colspan="3"></td></tr>
<tr><td>Peak breakage force</td><td>EN 13864</td><td colspan="3">% loss compared to unaged yarn: ≤ 25%
Minimum strength to be as detailed above</td></tr>
<tr><td>Yarn brittleness</td><td>FIFA TM 24</td><td colspan="3">≤ 40% loss compared to unaged yarn</td></tr>
<tr><td>Yarn tenacity loss</td><td>FIFA TM 24</td><td colspan="3">≤ 50% loss compared to unaged yarn</td></tr>
<tr><td>Colour retention</td><td>EN ISO 20105-A02</td><td colspan="3">≥ Grey scale 3</td></tr>
<tr><td colspan="2">Toxicology</td><td colspan="4">The yarns used in the turf shall either satisfy the requirements of Table 2 Category III of EN 71-3, or the requirements of ASTM F3188-16.
In addition to satisfying the requirements of this clause, a turf surface should comply with all toxicology and environmental regulations applicable in the country in which it is being sold.</td></tr>
</table>

EN = European Standard published by the European Standards Committee (CEN).

Component	Property		Test method	Requirement	
Synthetic-turf carpet	Carpet strength[1]		EN ISO 13934-1	> 15N/mm If the tensile strength in either the direction of manufacture or at 90° to the direction of manufacture is < 20N/mm, the maximum percentage variation between the two directions must be < 30% of the higher value	
	Dimensional stability[1]		EN 13744	≤ ± 0.5% after each stage of the test	
	Joint strength	Stitched	EN 12228 Method 1 EN 13744	Unaged	≥ 1000N/100mm
				After immersion in hot water	
		Bonded	EN 12228 Method 2 EN 13744	Unaged	≥ 75N/100mm
				After immersion in hot water	
	Tuft withdrawal force		EN 12228 Method 2 EN 13744	≥ 40N	
Infill materials	Inhalable dust content		EN 15051	Low or very low	
	Total content of the eight polycyclic aromatic hydrocarbons (PAH) detailed in the European Union's REACH regulation		AfPS GS 2019:01 PAK or ASTM F3496-20	≤ 20mg/kg Compliance with legal regulations (laws) shall always take precedence over this guide	
Shockpads	Shockpads should conform to European Standard EN 15330-4: Surfaces for sports areas (synthetic-turf and needle-punched surfaces primarily designed for outdoor use; specification for shockpads used with synthetic-turf and textile sports surfaces)				

1. Not applicable to turf carpets with a mass per unit area > 3.5kg/m^2, or that are intended to be fully bonded to a shockpad or contain at least 15kg/m^2 of infill

Disclaimer

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