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FIH Approved Hockey Turf

AstroTurf 11-36 EL10

Manufactured by: AstroTurf

Category of approval: FIH Global

TAYYAB IKRAM
FIH President

FIH Global category turfs are typically laid on fields intended for top-level international and national competitions. To provide optimum playing conditions they require watering prior to use.

Certificate No.: HT-26-023

Date of certification: 28 April 2026

Gazon approuvé par la FIH

AstroTurf 11-36 EL10

Fabriqué par: AstroTurf

Catégorie d'homologation: FIH Global

TAYYAB IKRAM
FIH President

Les gazons FIH Global sont généralement posés sur des terrains destinés à accueillir des compétitions internationales et nationales de haut niveau. Afin d'offrir des conditions de jeu optimales, ces gazons doivent être arrosés avant leur utilisation.

Numéro de certificat .: HT-26-023

Date de certification : 28 April 2026

Césped aprobado por la FIH

AstroTurf 11-36 EL10

Fabricado por AstroTurf

Categoría de homologación: FIH Global

TAYYAB IKRAM
FIH President

Los céspedes de la categoría FIH Global suelen instalarse en campos destinados a competiciones internacionales y nacionales de alto nivel. Para proporcionar unas condiciones de juego óptimas, los céspedes deben regarse antes de su uso.

Certificado n.º .: HT-26-023

Fecha de certificación : 28 April 2026

FIH Zugelassener Rasen

AstroTurf 11-36 EL10

Hergestellt von: AstroTurf

Zulassungskategorie: FIH Global

TAYYAB IKRAM
FIH President

FIH Global-Kunstrasen wird in der Regel auf Spielfeldern verlegt, die für internationale und nationale Wettkämpfe auf höchstem Niveau vorgesehen sind. Um optimale Spielbedingungen zu gewährleisten, muss der Kunstrasen vor der Nutzung bewässert werden.

Zertifikatsnummer .: HT-26-023

Datum der Zertifizierung : 28 April 2026

QUALITY PROGRAMME

ENGINEERED FOR HOCKEY

HOCKEY TURF FIH PRODUCT APPROVAL REPORT

Product name	AstroTurf 11-36 EL10
Manufacturer	AstroTurf
Product classification	Global

1 Introduction

Synthetic turf is hockey's preferred playing surface. First used in the 1970s, the sport has embraced the opportunities the surface offers to evolve into the fast, technically skilful game we know today. Using the latest technologies, manufacturers now produce specialist synthetic turfs designed for hockey; we call them hockey turfs.

A new sports field is a major investment, so it is paramount that it meets the expectations of those using, operating, and investing in the facility. To help ensure good quality hockey fields are built, the FIH has developed its Quality Programme for Hockey. A key part of the Quality Programme is the approval of hockey turfs. All **FIH Approved Hockey Turfs** have been independently tested and shown to comply with the quality and performance requirements of the ***FIH Hockey Turf and Field Standards*** (HTFS) – *Part 1*. Furthermore, the surfaces are manufactured by companies that are **FIH Preferred Suppliers** or **FIH Certified Manufacturers**. These companies operate robust quality and production control systems and have committed to work with the FIH to develop hockey around the world.

The HTFS has five categories of hockey turf. The hockey turf described in this report has been tested as a Global category surface. This is the highest category and is the type of surface on which top-level international and national competitions are played. To provide the slick, predictable, non-abrasive surfaces elite players require, Global category hockey turfs are watered prior to play. Water is an increasingly scarce resource so the FIH is encouraging manufacturers to develop surfaces that use water more efficiently, with the ultimate aim of having surfaces that do not require watering at all. The watering requirements of the hockey turf described in this report are detailed in section 4 of this report. They have been established as part of this test programme.

Experience has shown that certain properties of Global category hockey turfs are always acceptable when the surface is wet, so they are not assessed as part of this test programme. Similarly, as the surfaces are not primarily intended to be used without water, their performance under dry conditions is not assessed. If a hockey field having a Global category hockey turf is also likely to be used without water for lower levels of play or training it is recommended the hockey turf is also approved as an FIH National category product; these are tested in dry conditions and assessed against slightly more relaxed criteria.

Selecting an FIH approved hockey turf is the first step to ensuring a facility meets expectations. If, however, the turf is installed incorrectly, or it is laid on a poorly built base, the desired levels of quality and performance will not be achieved. Therefore, the FIH strongly recommends the construction of a new hockey facility is undertaken by a contractor that is either an **FIH Preferred Supplier** or an **FIH Certified Field Builder**. These are companies with a proven ability to build hockey facilities to standards the game requires. To independently verify the installation has been undertaken correctly, the FIH also recommends the facility is tested on completion in accordance with Part 2 of the HTFS. Assuming the field passes, it will then be awarded the prestigious designation of being an **FIH Certified Field**, joining a select group of the world's best hockey fields.

Please think about the environment before printing this report. If you do require a paper copy, please set your printer to print on both sides of the paper.

2 Test programme

Only the best quality hockey turfs qualify for FIH approval. The FIH Quality Programme is designed to ensure that hockey can be played in an enjoyable and safe way, on surfaces that are adequately robust to withstand the effects of use and weathering.

Using internationally recognised test methods, the HTFS specify how a hockey turf should be tested and sets limits of acceptability for the key properties that can be adversely affected when sub-standard or inappropriate components are used. Other key hockey characteristics are ensured by restricting the types of surface and conditions under which they can be used to those known to perform as players' desire.

The key sports performance properties are:

Ball rebound – the surface should not cause a ball to bounce too high or too low, and the bounce also needs to be consistent. This is checked by accurately measuring the height a hockey ball rebounds when it is dropped vertically onto the hockey turf from a height of 2.0m.

Ball roll – the speed or pace of the surface is key to a good hockey surface. Players do not want to play on surfaces that are too slow or too variable. To ensure a hockey turf has an acceptable speed (for the category of surface) a ball is rolled down a ramp and the distance it travels across the surface, and the degree to which it deviates from a straight line, are measured.

Shock absorption – a hockey turf needs to provide adequate cushioning to protect players as they run and fall on the surface. Using a mechanical simulation of a player running, the peak impact force experienced is measured and compared to peak force measured on concrete; the result being expressed as a percentage reduction; the higher the result the greater the shock absorption. A minimum value is specified to ensure surfaces are not too hard and an upper limit is set to ensure fields are not too soft or tiring.

Vertical deformation measures the degree to which the hockey turf compresses when a player runs on it The surface should allow some vertical deformation to prevent injuries through the jarring of a player's foot as it strikes the surface, but it is also important that the deformation is not too high, or players will find the surface unstable.

Shoe/surface interaction ensures a hockey turf provides adequate foot traction. If the level is too low players will find the surface slippery, if the level is too high players may suffer foot lock injuries. Shoe/surface interaction is assessed by measuring the resistance the surface offers to a rotating test plate, designed to replicate a hockey shoe, twisting on the surface.

To ensure longevity the HTFS also specifies a range of durability and material characteristics for the hockey turf. These include requirements for the quality of the synthetic turf yarns and carpets, and the shockpads (underlayers) that together form the hockey turf. Based on typical levels of use and adequate maintenance, the quality levels are intended to ensure a hockey turf carpet will provide a satisfactory playing surface for eight to ten years, and a shockpad can be used under at least two hockey turf carpets.

3 Hockey turf product details

The hockey turf described in this report is made up of the components detailed below. It is the interaction of the components working together that has been assessed. If any component is changed, the results no longer apply.

Synthetic turf carpet		
Method of manufacturing	Tufted	
Type of pile yarn	Curly mono-filament	
Pile yarn polymer (PE, PP, Nylon, etc.)		PE
Pile profile / shape		Rectangular
Primary backing		PP woven fabric, UV stabilised
Reinforcement scrim		Polypropylene
Secondary backing		Hybrid Emulsion
Method of carpet jointing		Bonded
Bonded joints	Adhesive type	Polyurethane
	Application rate	200–300 g/m
	Jointing film	PolyTape
Method of carpet fitting		Tensioned and clamped
Bonded to shockpad	Adhesive type	N/A
	Application rate	N/A

Manufacturer's product declaration and measured values:

Characteristic	Manufacturer's declaration	Measured value	% difference	Permitted difference	Pass or fail
Pile height (mm)	11	11.0	0%	± 10%	Pass
Tufts/m^2	75,630	76,091	+0.6%	± 10%	Pass
Filaments/m^2	907,560	913,092	+0.6%	± 10%	Pass
Pile weight (g/m^2)	1,375	1,489	+8.3%	± 10%	Pass
Pile yarn dtex	6,600	6,694	+1.4%	± 10%	Pass
Pile thickness (mm)	0.110	0.112	102%	≥ 90%	Pass
Carpet mass/m^2	2,460	2,699	+9.7%	± 10%	Pass

Shockpad					
Product name	EL10				
Manufacturer	AstroTurf				
Description	1-4 mm ELT rubber bound with PU binder				
Manufacturer's product declaration and measured values:					
Property	Declaration	Measured value	Permitted tolerance	Variation	Pass or fail
Thickness (mm)	10	10.2	≥ 90% ≤130%	102%	Pass
Mass per unit area (kg/m²)	6.5	6.3	± 10%	-3%	Pass
Shock absorption @ 23 °C	33	33	± 5	0%	Pass

4 Watering requirements

The sports performance results detailed in this report were obtained when the test specimens were wetted in accordance with the manufacturer's instructions using the watering application detailed. Note – If different watering rates are used on a field, the performance of the surface may differ and might not satisfy the requirements of high-performance hockey.	2 l/m²

5 Sports technical properties

Hockey turf products are tested under the conditions in which they may be used. Global National category hockey turfs are used when they are dry and wet (rain) and should have satisfactory characteristics under both conditions.

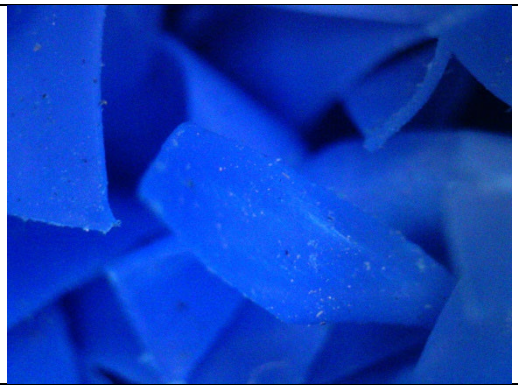
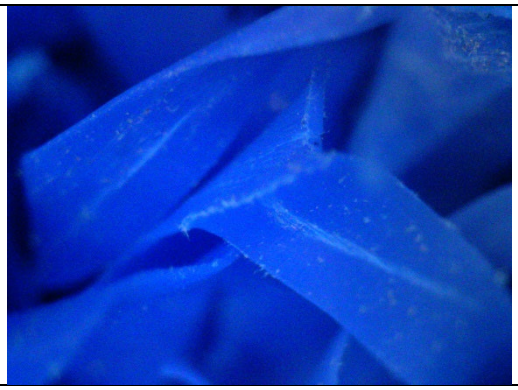
Property		Requirement	After irrigation		Wet	Pass or fail
			+ 15 min.	+ 45 min.		
Ball rebound	mm	100 – 400	388	396	376	Pass
Ball roll	m	≥ 10.0	13.3	12.6	13.4	Pass
Ball roll directional consistency	%	≤ + 10	3	7	4	Pass
Ball roll consistency after irrigation	%	≤ + 10	6			Pass
Ball roll deviation @ 9.5m	m	≤ 0.50	0.05		0.04	Pass
Shock absorption	%	45 – 60			52	Pass
Vertical deformation	mm	4 – 9			6.2	Pass
Shoe / surface friction	Nm	25 – 45			35	Pass
Skin – surface friction	µ	≤ 0.75		0.74		Pass

6 Effects of simulated use

To assess the ability of the surface to sustain acceptable performance through its life, it is subjected to simulated wearing in the laboratory before its performance is rechecked.

Property		Requirement	Result	Pass or fail
Ball rebound	mm	100 – 400	397	Pass
Shock absorption	%	45 – 60	50	Pass
Vertical deformation	mm	4 – 9	5.9	Pass
Shoe / Surface friction	Nm	25 – 45	36	Pass

The photographs below show the samples of the surface before and after the artificial wearing. They are included to allow consumers to see the effects and compare the durability of different products.

Sample before simulated wear conditioning	
	
x 20	x 100
Sample after simulated wear conditioning	
	
x 20	x 100

7 Water permeability

Component	Requirement	Result	Pass or fail
Complete system	≥ 150 mm/h	1,705 mm/h	Pass

8 Properties of synthetic turf carpet

Property			Requirement	Result	Pass or fail
Pile height			10 – 18 mm	11.0mm	Pass
Abrasion resistance			≤ 350 mg	62 mg	Pass
Carpet Strength	Not applicable as the carpet has a mass ≥ 3.50 kg/m²				☐
	Direction A		≥ 15 N/mm	22 N/mm	Pass
	Direction B			19 N/mm	Pass
	Variation		≤ 20%	14 %	Pass
	Not applicable as the carpet strength in both directions is ≥ 20 N/mm				☐
Tuft bind	Unaged (a)		≥ 25 N	28 N	Pass
	Water aged (b)		≥ 25 N	27 N	Pass
	(b) % of (a)		≥ 75%	97 %	Pass
Joint strength	Tensile	Unaged (a)	≥ 1000 N/100mm	3766 N/100mm	Pass
		Water aged (b)	≥ 1000 N/100mm	3548 N/100mm	Pass
		(b) % of (a)	≥ 75%	94%	Pass
	Peel	Unaged (a)	≥ 50 N/100mm	123 N/100mm	Pass
		Water aged (b)	≥ 50 N/100mm	112 N/100mm	Pass
		(b) % of (a)	≥ 75%	91 %	Pass
Dimensional Stability	This requirement does not apply to:				
	Hockey turf carpets having a mass per unit area ≥ 3.5 kg/m²				☐
	Hockey turf carpets that are fully bonded to a shockpad				☐
% change in dimensions)	After water immersion		≤± 0.5%	0.04 %	Pass
	After freezing			–0.19 %	Pass
	After heat exposure			0.37 %	Pass
	After 48 hours recovery			0.06 %	Pass

The quality of the yarns used to form the pile of a hockey turf are fundamental to the performance, appearance, and durability of a hockey field. Over time, all yarns will degrade due to weathering and mechanical wear. It is, therefore, important that the yarns have adequate strength and resistance to UV degradation.

There are a wide range of chemicals that can be used to enhance the properties of the plastics from which the yarns are made. To ensure these are not harmful to players or the environment, the yarns are tested for toxicology, using criteria established for children's toys as a reference.

As the pigments used to colour the yarns have different chemical properties, every colour used on a field (including lines, etc.) needs to be tested to provide reassurance that the field will have an acceptable service life.

Pile yarn colours are defined by their RAL colour code. These codes are shown on standardised colour charts produced by the RAL Colour Institute. Yarn and carpet manufacturers may use their own product names to describe a yarn colour; providing its RAL number is the same as the one listed in this report, the colour is approved.

To ensure that the yarns used in a field are always the same as the ones described in this report, yarn profile and polymer characterisation tests are undertaken to act as a future reference.

Turf colours – 11 a-side fields

Global category hockey turfs are normally installed on FIH Category 1, 2 or 3 hockey fields.

The field of play and perimeter run-offs on a Category 1 field must be a single shade of an approved blue (RAL 5002, 5005, 5010, 5017, 5019).

The field of play on a Category 2 or Category 3 field may either be an approved shade of blue or green. The perimeter run-offs on Category 2 and 3 fields may be any colour, but it is recommended that light colours are not used to avoid discolouration from dirt and algae growth, etc.).

The Laws of the Game state that hockey line markings must be white.

On Category 2 and 3 fields secondary sports markings (7 a-side, etc.) may also be marked onto a field. There are no restrictions on the colours that can be used, subject to local competition rules.

Turf colours – HOCKEY5s courts

Global category hockey turfs are normally laid on a Category 1 HOCKEY5s court. For this category of court, the hockey turf should be an approved shade of blue (RAL 5002, 5005, 5010, 5017, 5019) and the court markings should be white. For Category 2 and 3 courts there are no FIH colour restrictions, but local competition regulations may prefer a court to be blue or green.

The yarns listed on the following table have been shown to comply with the relevant requirements of the HTFS and are approved for use with this hockey turf.

Approved yarn colours

Colour	RAL Number		Application				
	Classic	Design	Field of Play		Perimeter run-offs	Line markings	
			Televised matches	Non-televised matches		Principal	Secondary
Rio Blue	5002	280 30 40	√	√	√		√
Field Green	6003	100 40 10		√	√		√
White	9010	110 92 05			√	√	√
Yellow	1017	070 80 50			√	√	√

Notes

1. The individual yarn test results are shown in the appendix of this report.

2. The manufacturer may have additional yarn colours tested at any time. If they are found to comply with the HTFS they will be approved, and an updated version of this report issued.

3. The RAL Numbers detailed above are based on an assessment of the colour of the pile yarns when they are laid flat. When a yarn is tufted into a carpet it may result in a multi-directional pile that can appear to be a slightly different colour to the flat yarn.

4. Small variations in colour may occur due to the way synthetic turf pile yarns are produced. This should not result in a colour variation across a single field, providing the hockey turf is produced from a single batch of yarn, but it may result in small differences in colour between fields.

9 Properties of shockpad

Tensile strength				
Type of shockpad	Condition	Requirement	Result	Pass or fail
Homogenous shockpad, less than 25mm thick	Unaged (a)	≥ 0.15 MPa	0.17 Mpa	Pass
	After air ageing	≥ 0.15 MPa	0.16 Mpa	Pass
	% reduction from (a)	≤ 25%	6 %	Pass
Homogenous shockpad with thickness of 25mm or greater	Unaged (a)	≥ 0.10 MPa	N/A	N/A
	After air ageing	≥ 0.10 MPa	N/A	N/A
	% reduction from (a)	≤ 25%	N/A	N/A
Shockpad with slots or grooves	Unaged (a)	≥ 0.10 MPa	N/A	N/A
	After air ageing	≥ 0.10 MPa	N/A	N/A
	% reduction from (a)	≤ 25%	N/A	N/A

Resistance to dynamic fatigue						
Property	Result				Requirement after dynamic fatigue	Pass or fail
	Before test (a)	After test	Effect of dynamic fatigue			
Shock absorption (% FR)	34.3	33.4	Difference	0.9	≤± 5 % FR difference to (a)	Pass
Thickness (mm)	10.2	9.9	%	97	≥ 85% of (a)	Pass
Physical damage	There shall be no tearing, splitting or delamination of the shockpad.					Pass

Resistance to bowing and curling			
Requirement		Result	Pass or fail
Maximum degree of bowing or curling	5 mm	0.7 mm	Pass

Water permeability		
Requirement	Result	Pass or fail
≥ 500 mm/h	> 2,000	Pass

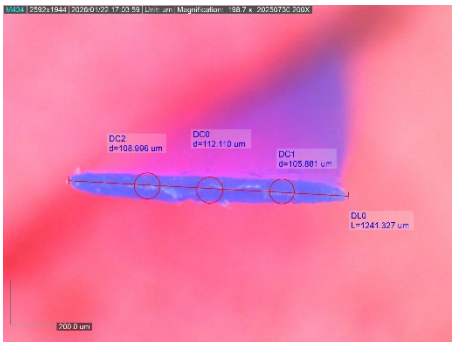
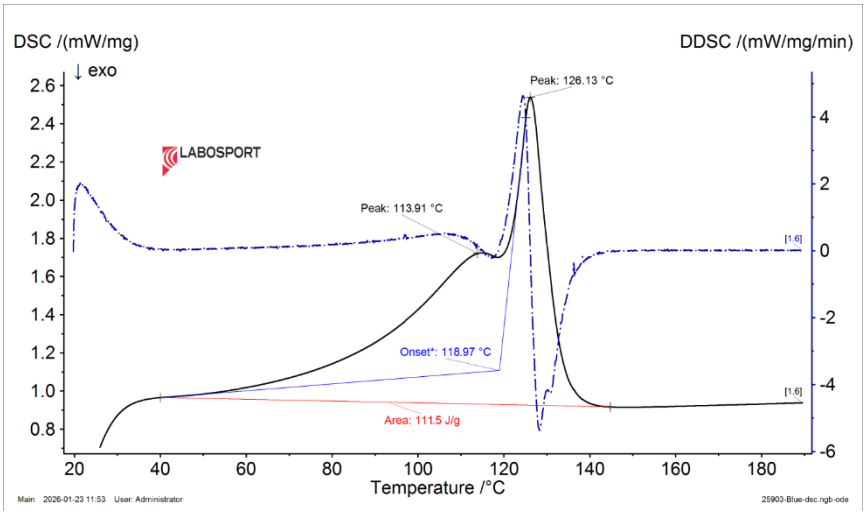
10 Additional information

11 Test institute declaration

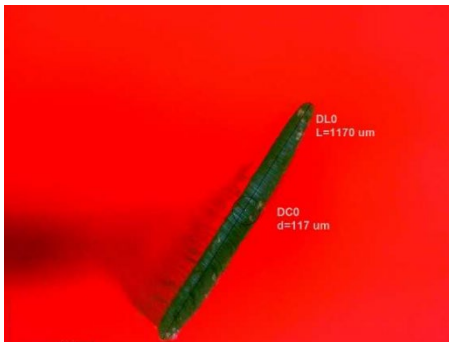
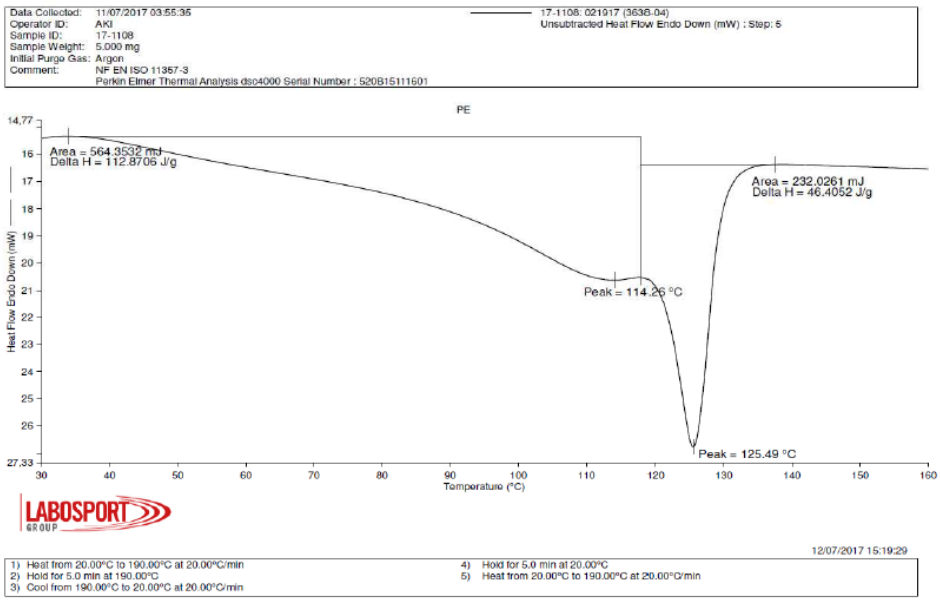
We certify that the tests described in this report have been carried out in accordance with the latest requirements of the HTFS and the report accurately reflects the outcome.

Hockey turf product name	AstroTurf 11-36 EL10
Hockey turf manufacturer	AstroTurf
Test institute name	Labosport Ltd
Project / Report reference	26-0402-B1
Authorised Signatory	
Name Authorised Signatory (printed)	David Rigby
Date	23.04.2026

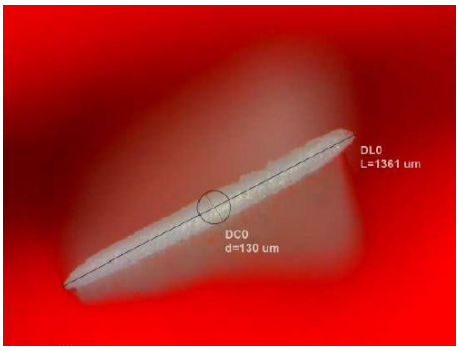
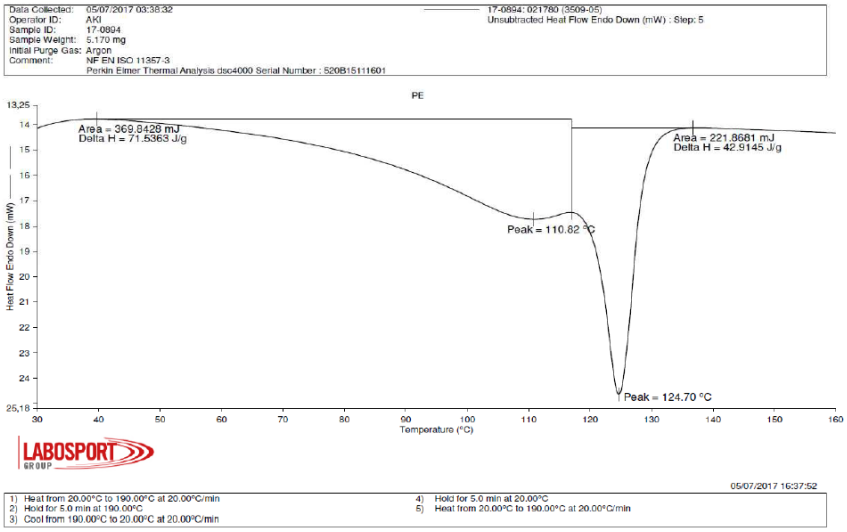
Appendix – pile yarn test results

Colour		Rio Blue
Yarn manufacturer		AstroTurf
Manufacturer's description		Rectangular – Poligras Mega CP
RAL Colour Codes	Classic	5002
	Design	280 30 40
Yarn profile & dimensions		
Yarn dtex	1,116	
Yarn thickness (µm)	112	
Yarn characterisation		
Peak temperature	113.91°C, 126.13°C	
Yarn polymer	PE	
Test institute	Labosport S.A.S	
Project reference	R171108-U1	

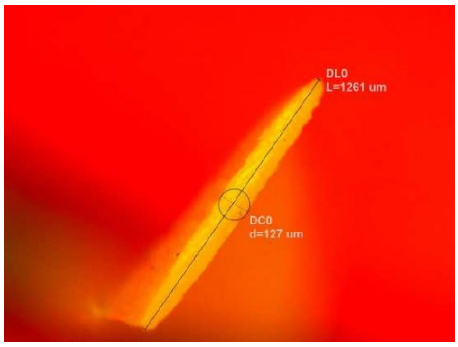
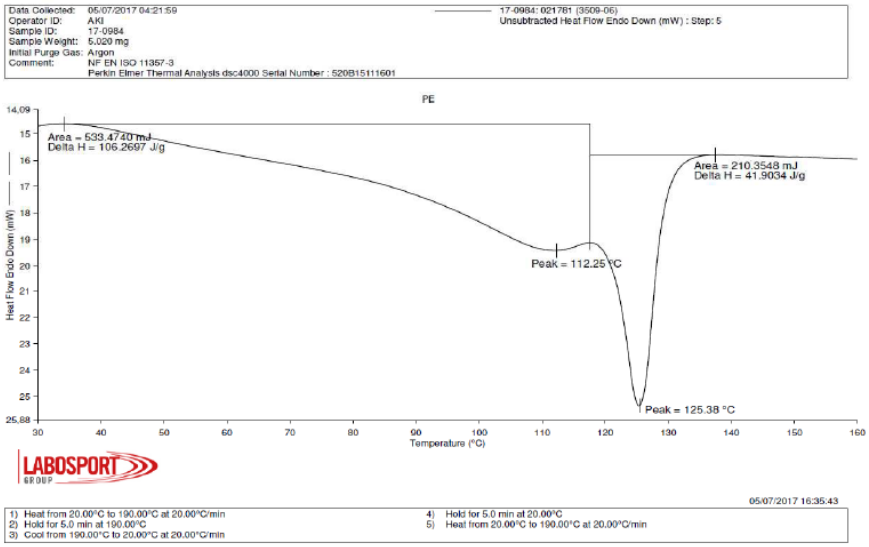
Property	Requirement				Result	Pass or fail
	Mono-filament yarn		Fibrillated yarn			
Yarn strength						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	13.4	Pass
Tenacity (cN/Tex)					12.0	Pass
Effects of artificial weathering						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	11.6	Pass
Tenacity (cN/Tex)					10.4	
% loss of strength	≤ 50%				13%	Pass
% loss of tenacity	≤ 50%				13%	Pass
Colour change	≥ Grey scale 3				4	Pass
Toxicology						
Test programme	EN 71/3					
Outcome	Does the yarn fully satisfy the requirements of the relevant test programme?				Yes – Pass	
In addition to complying with the toxicology requirements of the HTFS, a yarn should comply with any national toxicology or environmental regulations that apply in the countries in which it is being used.						

Colour		Field Green
Yarn manufacturer		AstroTurf
Manufacturer's description		Rectangular – Poligras Mega CP
RAL Colour Codes	Classic	6003
	Design	110 40 10
Yarn profile & dimensions		
Yarn dtex	1,032	
Yarn thickness (µm)	117	
Yarn characterisation		
Peak temperature	114.26°C, 125.49°C	
Yarn polymer	PE	
Test institute	Labosport S.A.S	
Project reference	R171108–T1	

Property	Requirement				Result	Pass or fail
	Mono-filament yarn		Fibrillated yarn			
Yarn strength						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	11.9	Pass
Tenacity (cN/Tex)					11.5	Pass
Effects of artificial weathering						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	8.9	Pass
Tenacity (cN/Tex)					8.8	
% loss of strength	≤ 50%				25%	Pass
% loss of tenacity	≤ 50%				23%	Pass
Colour change	≥ Grey scale 3				4	Pass
Toxicology						
Test programme	EN 71/3					
Outcome	Does the yarn fully satisfy the requirements of the relevant test programme?				Yes – Pass	
In addition to complying with the toxicology requirements of the HTFS, a yarn should comply with any national toxicology or environmental regulations that apply in the countries in which it is being used.						

Colour		White
Yarn manufacturer		AstroTurf
Manufacturer's description		Rectangular – Poligrass Mega CP
RAL Colour Codes	Classic	9010
	Design	110 92 05
Yarn profile & dimensions		
Yarn dtex	1,197	
Yarn thickness (ɥm)	130	
Yarn characterisation		
Peak temperature	110.82°C, 124.70°C	
Yarn polymer	PE	
Test institute	Labosport S.A.S	
Project reference	R170984-O1	

Property	Requirement				Result	Pass or fail
	Mono-filament yarn		Fibrillated yarn			
Yarn strength						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	11.7	Pass
Tenacity (cN/Tex)					9.8	Pass
Effects of artificial weathering						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	8.4	Pass
Tenacity (cN/Tex)					7.0	
% loss of strength	≤ 50%				28%	Pass
% loss of tenacity	≤ 50%				29%	Pass
Colour change	≥ Grey scale 3				4	Pass
Toxicology						
Test programme	EN 71/3					
Outcome	Does the yarn fully satisfy the requirements of the relevant test programme?				Yes – Pass	
In addition to complying with the toxicology requirements of the HTFS, a yarn should comply with any national toxicology or environmental regulations that apply in the countries in which it is being used.						

Colour		Yellow
Yarn manufacturer		AstroTurf
Manufacturer's description		Rectangular
RAL Colour Codes	Classic	1017
	Design	070 80 50
Yarn profile & dimensions		
Yarn dtex	1,051	
Yarn thickness (µm)	127	
Yarn characterisation		
Peak temperature	112.25°C, 125.38°C	
Yarn polymer	PE	
Test institute	Labosport S.A.S.	
Project reference	R170984-P1	

Property	Requirement				Result	Pass or fail
	Mono-filament yarn		Fibrillated yarn			
Yarn strength						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	12.0	Pass
Tenacity (cN/Tex)					11.4	
Effects of artificial weathering						
Tensile strength (n)	≥ 5N	☒	≥ 30 N	☐	7.2	Pass
Tenacity (cN/Tex)					6.9	
% loss of strength	≤ 50%				40%	Pass
% loss of tenacity	≤ 50%				39%	Pass
Colour change	≥ Grey scale 3				4	Pass
Toxicology						
Test programme	EN 71/3					
Outcome	Does the yarn fully satisfy the requirements of the relevant test programme?				Yes – Pass	
In addition to complying with the toxicology requirements of the HTFS, a yarn should comply with any national toxicology or environmental regulations that apply in the countries in which it is being used.						

FIH facilities guidance – helping you provide great hockey facilities

This report is issued by the FIH Quality Programme. Other information that might assist you is available at Resources Hub (fih.hockey). It includes:

- Facilities Guidance - Outdoor Hockey Facilities
- Facilities Guidance – Building Hockey Fields
- Facilities Guidance - GEN 2 multi-sports areas
- Facilities Guidance - HOCKEY5s Courts
- Facilities Guidance - Sports Lighting for Non-Televised Outdoor Hockey
- Facilities Guidance - Sports Lighting for Televised Outdoor Hockey
- Facilities Guidance - Hockey Field Irrigation
- Facilities Guidance - Indoor Hockey

- Hockey Turf and Field Standards, Part 1 - FIH Approved Hockey Turfs
- Hockey Turf and Field Standards, Part 2 - 11 a-side hockey fields
- Hockey Turf and Field Standards, Part 3 – HOCKEY5s courts
- Hockey Turf and Field Standards, Part 4 – Temporary Overlay Pitches (TOPS)

In addition to FIH Approved Hockey Turfs, the FIH Quality Programme includes:

- FIH Approved Sports Lighting
- FIH Approved Field Equipment:
    - Hockey Goals
    - Team Shelters
    - Technical Officials Booths
    - HOCKEY5s Rebound Boards
    - Indoor Hockey goals
    - Indoor Hockey side-boards

Details of all FIH Approved hockey products can be found at FIH Quality Programme

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