DFE 1.5” 47 oz Testing

Report #: *96003*

Report Date: *January 30, 2025*

Client: All American

3919 Smyrna Church Road

Chatsworth, GA 30705

Test Report Approval:

Erle Miles, III, Lab Director Testing Services (TSI) LLC

TSi Accreditation:

Our Laboratory is accredited by NVLAP (Lab Code 100108-0), which is part of NIST and the US Dept of Commerce. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, and any agency of the U.S. Government. The above testing is under the scope of our NVLAP accreditation. Testing Services LLC is a scientific body member of ISSS (International Sports Surface Science Society) and a member of the Synthetic Turf Council (STC).

TEST SCOPE: *Testing Services LLC was instructed by the client to perform product testing on a finished dual fiber (monofilament/slit film) 47 oz 1.5" synthetic turf in accordance with ASTM, EN, FIFA or other specifications requested by the client.*

TEST METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following…			
Standard:	*ASTM D7138*	***Test Method:***	*Standard Test Method for Determination of Melting Temperatures of Synthetic Fibers* ***(Fiber Identification)***
Standard:	*ASTM D792*	***Test Method:***	*Standard Test Method for Density and Specific Gravity* ***(Displacement of Plastics)***
Standard:	*ASTM D1907*	***Test Method:***	*Standard Test Method for Linear Density of Yarn by the Skein Method* ***(Yarn Denier)***
Standard:	*ASTM D2256*	***Test Method:***	*Standard Test Method for Tensile Properties of Yarns by the Single Strand Method* ***(Yarn Breaking Strength/Elongation)***
Standard:	*ASTM D3218*	***Specification:***	*Standard Specification of Polyolefin Monofilaments* ***(Ribbon Thickness)***
Standard:	*ASTM F2765*	***Specification:***	*Standard Specification for Total Lead Content in Synthetic Turf Fibers* ***(Lead Content)***
Standard:	*ASTM D5848*	***Test Method:***	*Standard Test Method for Mass per Unit Area of Pile Yarn Floorcoverings* ***(Weights)***
Standard:	*ASTM D5823*	***Test Method:***	*Standard Test Method for Tuft Height of Pile Yarn Floorcoverings* ***(Tuft Height)***
Standard:	*ASTM D5793*	***Test Method:***	*Standard Test Method for Binding Sites Per Unit Length or Width of Pile Yarn Floorcoverings* ***(Stitch & Gauge Count)***
Standard:	*ASTM D1335*	***Test Method:***	*Standard Test Method for Tuft Bind Strength of Pile Yarn Floorcoverings* ***(Tuft Lock Strength)***
Standard:	*ASTM D5034*	***Test Method:***	*Standard Test Method for Breaking Strength and Elongation of Textile Fabrics* ***(Tear Strength)***
Standard:	*ASTM D2859*	***Test Method:***	*Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials* ***(Small Scale Pill Flammability)***
Standard:	*ASTM F355*	***Test Method:***	*Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials* ***(G-max)***
Standard:	*ASTM F1551*	***Test Method:***	*Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials: Suffix-DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems and Permeable Bases* ***(Water Permeability)***
Standard:	*EN 15336*	***Test Method:***	*Surface for Sports Areas, Exposure for Synthetic Turf to Simulated Wear* ***(LiSport)***

SAMPLING PLAN:

Sampling Date:	***12/27/2024***

- *Specimen sampling is performed in the sampling department at TSI.*
- *The sampling size of specimens is determined by the test method requirements.*
- *In the event a specific sampling size is not called for, a determination will be made based on previous testing experience and approved for use by an authorized manager.*
- *All samples are subjected to the outside environmental conditions of temperature and relative humidity.*
- *Sample requiring pre-determined exposure to specified environmental conditions based on a specific test method, take place in the departments in which they are tested*

DEVIATIONS FROM TEST METHOD:

State reason for any Deviation from, Additions to, or Exclusions from Test Method.
➢ *Pill Flammability: Section 8.4 Place the eight specimens in an oven in a manner that will permit free circulation of the air at 105°C. This is not permissible due to the low melting point of polyethylene fiber.*

TESTING SERVICES

TEST DATA:

	Test Method	Date Tested	Test Description		Test Result 9,000 Slit		Test Result 10,800 Mono	
Yarn Analysis	ASTM D7138	1/24/2025	Fiber ID, Melt Point		120°C	Polyethylene	121°C	Polyethylene
	ASTM D1907	1/6/2025	Yarn Denier		10,038		10,826	
	ASTM D2256	1/6/2025	Avg Yarn Breaking Strength	Elongation	17.87 lbs/force	69.13%	22.04 lbs/force	70.24 %
	ASTM D3218	1/6/2025	Ribbon Thickness		0.00455"	116 microns	0.00876"	223 microns
	ASTM F2765		[1]Lead Content		< 0.25 mg/Kg		< 0.25 mg/Kg	
	ASTM D792		[1]Specific Gravity		0.959		0.949	

[1]Analysis performed by AIRL, Inc 1550 37th St NE Cleveland, TN 37312. Their NELAP accreditations are on file and can be submitted upon request.

	Test Method	Date Tested	Test Description	Test Result	
Construction	ASTM D5848-20	1/6/2025	Total Product Weight	79.33 oz/yd²	
	ASTM D5848-20	1/6/2025	Pile Yarn Weight	47.21 oz/yd²	
	ASTM D5848-20	1/6/2025	Primary Backing Weight	8.02 oz/yd²	
	ASTM D5848-20	1/6/2025	Secondary Backing Weight	24.10 oz/yd²	
	ASTM D5823-19	1/6/2025	Average Pile Height	1.50"	
	ASTM D5793-18	1/6/2025	Stitch Count & Gauge	2.33 Stiches per inch	3/8" Gauge
	ASTM D1335-21	12/31/2024	Average Tuft Bind Strength	10.7 lbs/force	
	ASTM D5034-21	12/31/2024	Average Grab Tear-Length, MD	291 lbs/force	
	ASTM D5034-21	12/31/2024	Average Grab Tear-Width, CMD	386 lbs/force	

	Test Method	Date Tested	Test Description	Test Result	
Performance	ASTM D2859-16 (2021)	1/13/2025	[1] Pill Flammability	8 out of 8 Pass	Meets 16CFR 1630 (FF1-70)
	ASTM F355-16e1	1/13/2025	[1,2,3] Gmax	95	
	ASTM F1551	1/13/2025	Water Permeability	150 inches/hour	

[1] Infill System: 70% Crumb Rubber 30% Silica Sand Filled to 0.70"-0.50" Exposed
[2] Pad Underlayment: 16mm
[3] Subbase: Concrete

TEST METHODS REQUESTED:

Testing Services, Inc was instructed by the client to perform the following testing:			
Standard:	*FIFA Section 17*	***Test Method:***	*Procedure for Simulated Mechanical Abrasion*
Standard:	*EN 15336*	***Test Method:***	*Surface for Sports Area, Exposure for Synthetic Turf to Simulated Wear (LiSport)*

TEST EQUIPMENT:

Wear Tester:	*Deltec Manual 1.2m LiSport*
Model #:	*Y2017 1701003*
Date of Mfg:	*1/2017*
Dimensions:	*3070mm X 1300mm*

TEST SCOPE:

This procedure simulates high levels of athletic use of synthetic turf in an accelerated period of time under laboratory conditions. Two studded rollers were traversed to and fro over the infilled turf to produce mechanical action of the surface that occurs during normal use. This report details the effects of this mechanical action as it relates to degradation of the pile fiber. The client, commissioned TS to evaluate simulated wear of submitted finished synthetic turf, referenced above, with the use of an infill system.The results are indicative of mechanical wear only and do not take into account the effects of weathering, uv degradation, or use of the turf outside of competition.

PROCEDURE:

A test specimen, 560mm X 2438mm, was cut from the sample lot to be exposed to mechanical abrasion. The specimen was infilled with above listed infill. The rollers were positioned onto the surface of the system, with the pressure set automatically @ 1kg per cm. All speeds of the machine components were set in accordance with FIFA & CEN standards. The design of the machine ensures that the studs do not repeatedly impact the same spots.

The Lisport was then activated for a prescribed number of cycles. The Lisport was stopped every 5,000 cycles and the pile fiber degradation was graded, the surface re-groomed, and displaced infill was reinstalled. Photos and fiber specimens were taken at each 5,000 increments.

DEVIATION FROM TEST METHOD:

State reason for any deviation from, additions to, or exclusions from test method:
None

TEST RESULTS:

- *A scale of 1 to 5 was used for descriptive evaluation of the pile fibers due to the effect of mechanical wear (Lisport) at each 5,000 cycle interval.*
- *The following is an explanation of the scale:*

Rating	***Description***
1.0	*None or Negligible*
2.0	*Slight*
3.0	*Moderate*
4.0	*Considerable*
5.0	*Severe*

- *The following was rated using the referenced rating scale: tuft loss, pile flattening, fiber splitting, and infill dispersion.*

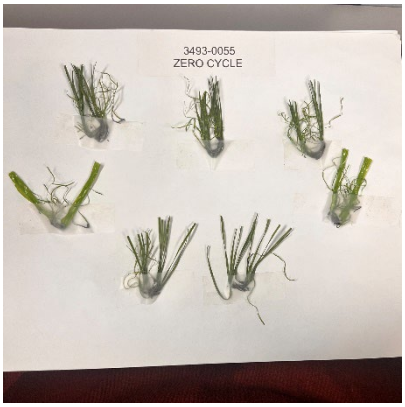
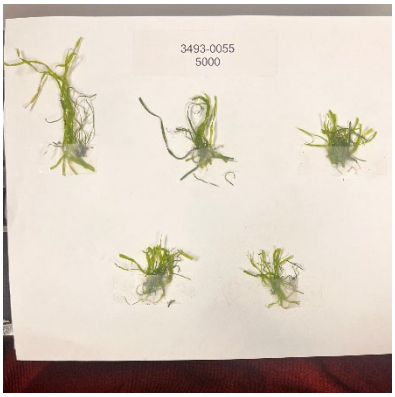
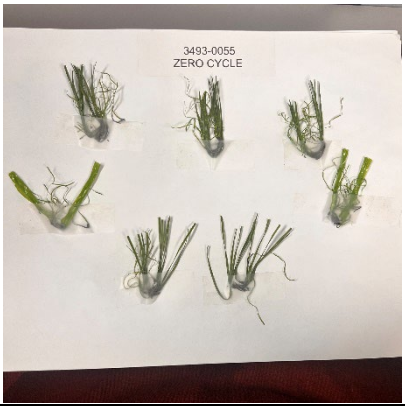
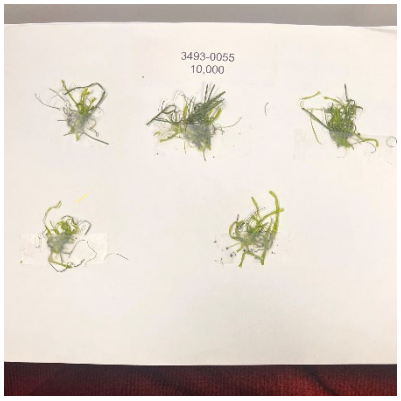
# of Cycles	***Infill Dispersion***		***Tuft Loss***		***Compaction/Flattening***		***Fiber Splitting***	
	Mono	***Slit Film***	***Mono***	***Slit Film***	***Mono***	***Slit Film***	***Mono***	***Slit Film***
5,000	*1.0 Negligible*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*
10,000	*1.0 Negligible*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*	*2.5 Slight/Moderate*	*2.0 Slight*
15,000	*2.0 Slight*	*2.0 Slight*	*2.0 Slight*	*1.0 Negligible*	*2.0 Slight*	*1.0 Negligible*	*3.0 Moderate*	*2.0 Slight*
20,000	*2.0 Slight*	*2.0 Slight*	*3.0 Moderate*	*1.0 Negligible*	*3.0 Moderate*	*1.0 Negligible*	*3.0 Moderate*	*2.0 Slight*

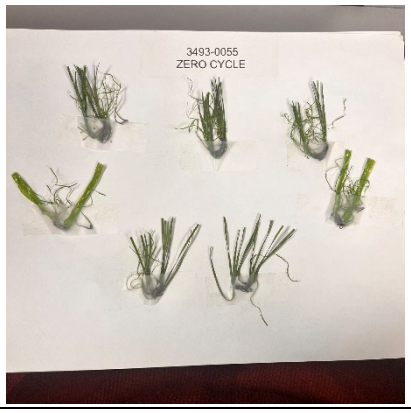
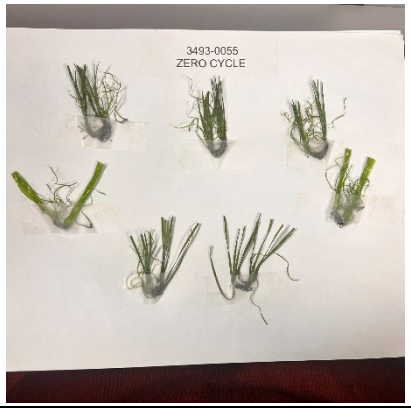
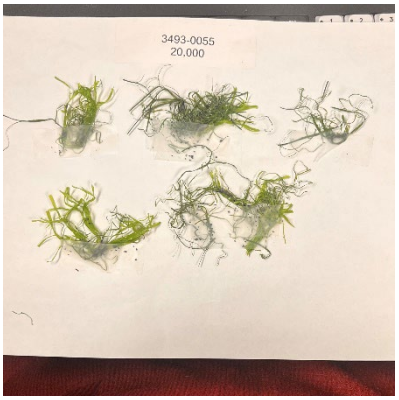
Notes:

> Based on the following "typical" use of the turf: 40 hours/per week, 50 weeks/per year or 2,000 hrs. of athletic competition, the Lisport wear would indicate at ***20,000 cycles the equivalency of 8 years wear.***

> Monofilament yarns began "thinning" at 10,000 cycles.

APPENDIX A: Camera and Microscopic View of Fibers

After 5,000 Cycles of LiSport Exposure		
After 10,000 Cycles of LiSport Exposure		

After 15,000 Cycles of LiSport Exposure		
After 20,000 Cycles of LiSport Exposure		

PRECISION/BIAS: ***Gmax:*** *The precision of the test method, conducted by interlaboratory testing, is estimated to be ± 5% for gmax and ± 10% for HIC. Users of this test report should consider the reproducibility limit as a general rule and the associated probability of 95%. Testing Services LLC undertakes all assignments for our clients on a best effort basis. Our results, findings, and judgements are based on the information using the latest test methods available. Testing Services LLC can only ensure the test results for the specific items evaluated. Unless otherwise noted in the deviation's sections of this report, all tests performed were in compliance with the stated test method.*

PRECISION/BIAS: ***Pill Flammability:*** *Level of uncertainty is not possible due to a lack of no standard reference to evaluate the precision of the pass/fail criterion. The only reportable result outlined in the standard is whether the charred portion of the test specimen extends within (1.0") of the edge of the hole in the steel frame. There are no requirements for quantitative measurement of the charred portion of the test specimen. No bias statement can be made since the true value cannot be established.*

END OF REPORT