LABORATORY TEST REPORT

Report # 82504
Lab Test Number: 3251-6010
Report Date: March 24, 2021

ASTM D5848 Weights

www.testingservices-usa.com ▪ (706)226-1400
office@testingservices-usa.com

IncStores

TEST MATERIAL:

Date Material Received:	February 15, 2021
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Product Name:	IncStores product name - No Limit Turf Rolls

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following...			
Standard:	ASTM D5848	Test Method:	Standard Test Method for Mass per Unit Area of Pile Yarn Floorcoverings

SAMPLING PLAN:

Sampling Date:	2/15/2021

- 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 humidly.
- 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

DEVIATION FROM TEST METHODS:

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
None

TEST SUMMARY:

TEST METHOD	TEST DESCRIPTION	TEST RESULT
ASTM D5848-20	Total Product Weight	88.36 oz/yd²
ASTM D5848-20	Pile Yarn Weight	58.19 oz/yd²
ASTM D5848-20	Primary Backing Weight	7.80 oz/yd²
ASTM D5848-20	Secondary Backing Weight	22.37 oz/yd²

Uncertainty:
We undertake all assignments for our clients on a best effort basis. Our findings and judgments are based on the information to us using the latest test methods available.
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NVLAP TESTING 100108-0

Synthetic Turf Council Certified

ASTM Organizational Member

Test Report Approval:

Digitally signed by Erle Miles
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Date: 2021.03.30 16:22:35 -04'00'

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

TSi Accreditation: Our laboratory is accredited by the US Dept. of Commerce, National Institute of Standards and Technology: ISO/IEC 17025:2005. Our code # is: NVLAP 100108-0.
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IncStores

TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following...			
Standard:	ASTM D1335	Test Method:	Standard Test Method for Tuft Bind Strength of Pile Yarn Floorcoverings

SAMPLING PLAN:

Sampling Date:	4/14/2020

- Specimen sampling is performed in the sampling department at TSI.
- The sampling size of specimens is determined by the test method requirements.
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DEVIATION FROM TEST METHOD:

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
None

TEST SUMMARY:

TEST METHOD	TEST DESCRIPTION	TEST RESULT
ASTM D1335-17e1	Average Tuft Bind Strength	10.3 lbs/force

➢ Each individual pull was made on a combination of Monofilament fibers and textured fibers, same needle site

Pull #1	8.617 lbs/force	Pull #2	10.39 lbs/force	Pull #3	11.68 lbs/force	Pull #4	11.57 lbs/force	Pull #5	8.349 lbs/force
Pull #6	13.83 lbs/force	Pull#7	9.127 lbs/force	Pull #8	9.503 lbs/force	Pull #9	11.60 lbs/force	Pull#10	11.92 lbs/force
Pull #11	9.745 lbs/force	Pull #12	10.60 lbs/force	Pull #13	8.322 lbs/force	Pull #14	10.01 lbs/force	Pull #15	9.476 lbs/force

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Date: 2020.10.29 19:10:45 -04'00'

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NVLAP TESTING 100108-0

SYNTHETIC TURF COUNCIL CERTIFIED

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TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf Fibers
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following...			
Standard:	ASTM F2765	Test Method:	Standard Specification for Total Lead Content in Synthetic Turf Fibers

SAMPLING PLAN:

Sampling Date:	4/14/2020

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DEVIATION FROM TEST METHOD:

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None

TEST SUMMARY:

TEST METHOD	TEST DESCRIPTION	TEST RESULTS	ACCEPTABLE LEVEL PER TEST METHOD
ASTM F2765 / EPA 3052 / 6010	Total Lead Content digested by 3052 @210°C	<0.5 mg/Kg	<300 mg/Kg

➢ Under NVLAP guidelines, TS is to report any outsourcing of testing to another laboratory facility. In the above testing, some/all of tests were outsourced to: Analytical Industrial Research Laboratories. Their accreditations are on file and available upon request.

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LABORATORY TEST SUMMARY

Report # 81000C-01
Lab Test Number: 3192-3348
Report Date: August 7, 2020

ASTM D2859 Ignition Characteristics- Pill Flammability

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IncStores

TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls
Infill:	16 Grit Sand, to ¾" exposed tuft

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following…			
Standard:	ASTM D2859	Test Method:	Standard Test Method for Ignition Characteristics of Finished Textile Pile Yarn Floorcoverings

SAMPLING PLAN:

Sampling Date:	4/14/2020

- Specimen sampling is performed in the sampling department at TSI.
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DEVIATION FROM TEST METHOD:

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
Specimens were not exposed to air circulating oven.

TEST SCOPE: This test method provides a method of determining the flammability characteristics of textile products when exposed to an ignition source in a laboratory environment. Eight specimens were taken from the sample lot, 230mm X 230mm, and preconditioned in an air circulating oven @ 150°C for 2 hours. After removal from the oven, the specimens are placed into a desiccator for 1 hour prior to performing the test. Each specimen was then placed into the test chamber floor with the pile surface up and a steel frame, 230mm X 230mm with 200mm diameter hole, placed on top of the specimen. A methenamine tablet was placed centrically onto the pile surface. The pill was ignited using a lighted match, with the ignition flame and propagated flame allowed to self-extinguish.

CRITERIA: The specimen passes, if the charred portion of the test specimen, did not extend to within 25mm (1") of the diameter hole of the steel frame. The U.S. Consumer Product Safety Commission requires that at least seven of the eight specimens pass the test for acceptance as meeting the standard.

TEST SUMMARY:

TEST METHOD	TEST DESCRIPTION	TEST RESULT	
ASTM D2859-16	Ignition Characteristics of Textile Floor Coverings (Pill Test)	8 out of 8 Pass	Passes, U.S. CPSC 16CFR 1630 (FF1-70), Carpets & Rugs

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Date: 2020.10.29 18:11:11 -04'00'

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SYNTHETIC TURF COUNCIL CERTIFIED

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LABORATORY TEST SUMMARY

Report # 81000D-01
Lab Test Number: 3192-3348
Report Date: August 7, 2020

ASTM F1551, DIN 18-035 Part 6; Water Permeability

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TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls
Infill:	16 Grit Sand, to ¾" exposed tuft

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following…			
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

SAMPLING PLAN:

Sampling Date:	4/14/2020

- Specimen sampling is performed in the sampling department at TSI.
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DEVIATION FROM TEST METHOD:

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
None

PROCEDURE:

This test method determines the rainfall drainage capacity (permeability) of the playing surface. Test data values represent drainage rates vertically thru the turf with infill listed above, and do not take into account the percolation properties of a pad and/or an underlying sub base. Three specimens, 11.5" diameter, were cut from the 15' turf roll, side-center-side manner. Each turf specimen was securely fastened to the permeability tube using mechanical flanges, ensuring vertical water flow thru the product. Water was pumped into the tube faster than could exit, until the water level reached 6". The water source was shut off, allowing the accumulated 6" water level to recede. The recede was timed via stopwatch until the water level exited the turf. The flow time was recorded in seconds. This procedure was repeated a total of 4 times where, the first pass was for conditioning, with passes 2,3,4 used for averaging. This process was repeated on the remaining specimens.

TEST SUMMARY:

Specimen #	Drainage (Seconds)	gal/min/yd²	Rainfall Capacity (inches/hour)
1	144.3	14.0	43.0
2	137.0	14.7	45.2
3	135.2	14.9	45.8
Average			44.7 inches/hour

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IncStores

TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following...			
Standard:	ASTM G154	Test Method:	Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Non-Metallic Material

SAMPLING PLAN:

Sampling Date:	4/14/2020

- Specimen sampling is performed in the sampling department at TSI.
- The sampling size of specimens is determined by the test method requirements.
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DEVIATION FROM TEST METHOD:

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
None

TEST SUMMARY:

TEST METHOD	TEST DESCRIPTION	TEST RESULTS			
		500 Hours Exposure	1000 Hours Exposure	1500 Hours Exposure	2000 Hours Exposure
ASTM G154-16	QUV Accelerated Weathering	Color: 10 Texture: 10	Color: 10 Texture: 10	Color: 10 Texture: 10	Color: 10 Texture: 10

Change Rating:
10: Negligible or No Effect
9: Very Slight
8: Slight
6: Moderate
4: Pronounced
2: Severe
0: Very Severe

Test Equipment: QUV/se
UVA-340 lamps, 0.77 W/m²
16 hours UV light @ 60°C
8 hours condensation @ 50°C
Light Cycle: Continuous

*Ratings and comments are based on guidelines provided by Q Labs.

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IncStores

TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls
Infill:	16 Grit Sand, to ¾" exposed tuft

TESTING 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)

SAMPLING PLAN:

Sampling Date:	4/14/2020

- Specimen sampling is performed in the sampling department at TSI.
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TEST EQUIPMENT:

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

PRINCIPLE:

This procedure simulates high levels of athletic use of the 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, Artificial Grass Liquidators, 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 activated for 1,000 cycles. At the end of the 1,000 cycles the pile fiber degradation was graded, a photo and fiber sample were taken.

DEVIATION FROM TEST METHOD:

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

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TEST MATERIAL:

Date Material Received:	April 14, 2020
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Material ID:	IncStores product name - No Limit Turf Rolls
Infill:	16 Grit Sand, to ¾" exposed tuft
Measured Tuft Height:	45mm
Average Infill Depth:	26mm
Exposed Tuft Above Infill:	19mm

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 1,000 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

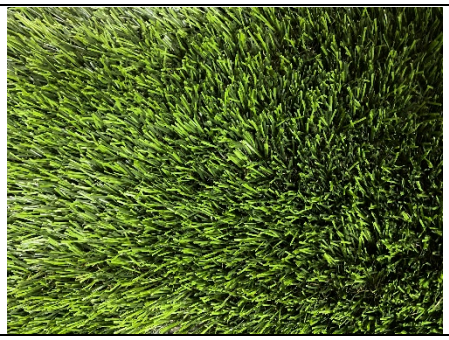
- The following was rated using the referenced rating scale: tuft loss, pile flattening, fiber splitting, and infill dispersion.

# of Cycles	Infill Dispersion	Tuft Loss	Pile Flattening	Fiber Splitting
1,000	2.0	1.0	3.0	1.0

CONCLUSION: Photographs of the overall view of the fibers are provided in the following appendixes.

Infill dispersion was slight for the entire test duration. Tuft Loss and fiber splitting was negligible for the entire test duration. Pile flattening was moderate.

APPENDIX A: Camera and Microscopic View of Fibers

Prior to any LiSport Exposure		
After 1,000 Cycles of LiSport Exposure		

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