

## TEST SUMMARY

**CLIENT:**

|               |                           |                  |                       |
|---------------|---------------------------|------------------|-----------------------|
| Company:      | Shaw Sports Turf          | Report Number:   | 65375                 |
| Address:      | 185 South Industrial Blvd | Lab Test Number: | 2757-5431             |
|               | Mail Drop ODY-22          | Test Date:       | 10/13/2015-10/28/2015 |
|               | Calhoun, GA 30701         | Report Date:     | 10/28/2015            |
|               |                           | Page:            | 1 of 3                |
| Requested By: | Riley Lawson              |                  |                       |

**TEST MATERIAL:**

|                     |                          |     |       |                |            |
|---------------------|--------------------------|-----|-------|----------------|------------|
| Material Type:      | Slit Film Synthetic Turf |     |       | Date Received: | 10/13/2015 |
| Material Condition: | EXCELLENT:               | XXX | GOOD: | POOR:          | REJECTED:  |
| Product ID. Number: | TF964 Lyman Hall         |     |       |                |            |
| Roll #:             | TT00NUW                  |     |       |                |            |

**TESTING METHODS REQUESTED:**

| <i>Testing Services Inc. was instructed by the client to test for the following...</i> |                         |              |   |
|--|-------------------------|--------------|---|
| Standard:  | ASTM D1907              | Test Method: | Standard Test Method for Linear Density of Yarn by the Skein Method   |
| Standard:  | ASTM D2256              | Test Method: | Standard Test Method for Tensile Properties of Yarn by the Single Strand Method   |
| Standard:  | ASTM D3218              | Test Method: | Standard Test Method for Specification of Polyolefin Monofilaments  |
| Standard:  | ASTM D7138              | Test Method: | Standard Test Method to Determine Melting Temperature of Synthetic Fibers   |
| Standard:  | ASTM D5848              | Test Method: | Standard Test Method for Mass Per Unit Area of Pile Yarn Floorcoverings   |
| Standard:  | ASTM D5823              | Test Method: | Standard Test Method for Tuft Height of Pile Yarn Floorcoverings  |
| Standard:  | ASTM D1335              | Test Method: | Standard Test Method for Tuft Bind of Pile Yarn Floorcoverings  |
| Standard:  | ASTM D5034              | Test Method: | Standard Test Method for Breaking Strength of Textile Fabrics (Grab)  |
| Standard:  | ASTM D5793              | Test Method: | Standard Test Method for Binding Sites per Unit Length or Width of Pile Yarn Floorcoverings   |
| Standard:  | TSI Internal            | Test Method: | Measurement of Perforation Spacing and Diameter of Synthetic Turf System for Drainage   |
| Standard:  | ASTM D2859              | Test Method: | Standard Test Method for Ignition Characteristics of Finished Textile Pile Yarn Floorcoverings  |
| Standard:  | ASTM F355a              | Test Method: | Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials  |
| Standard:  | ASTM F1292              | Test Method: | Standard Specification for Impact Attenuation of Surface Systems In and Around Playground Equipment   |
| Standard:  | EN1969                  | Test Method: | Surfaces for Sports Areas, Determination of Thickness of Synthetic Sports Surfaces, Infill Depth  |
| Standard:  | ASTM F1015              | Test Method: | Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces   |
| Standard:  | BS7044 Part 4, Method 4 | Test Method: | Artificial Sports Surfaces, Specifications for Surfaces for Multi-Sport Use: Determination for Infiltration Rate  |
| Standard:  | ASTM F1551              | Test Method: | Standard Test Method for Comprehensive Characterization of Synthetic Turf Placing Surfaces and Materials, Suffix AT-030: Sports Shoe Traction (COF) and Traction Differential |
| Standard:  | EN14808                 | Test Method: | Surfaces for Sports Areas: Determination of Shock Absorption (Force Reduction)  |
| Standard:  | EN14809                 | Test Method: | Surfaces for Sports Areas: Determination of Vertical Deformation  |
| Standard:  | EN15301                 | Test Method: | Surfaces for Sports Areas: Determination of Rotational Resistance   |
| Standard:  | EN933                   | Test Method: | Test for Geometrical Properties of Aggregates, Determination of Particle Size Distribution, Sieving Method  |
| Standard:  | EN14955                 | Test Method: | Surfaces for Sports Areas: Determination of Composition and Particle Shape of Unbound Mineral Surfaces for Outdoor Sports Areas   |
| Standard:  | EN1097                  | Test Method: | Tests for Mechanical and Physical Properties of Aggregates, Determination of Particle Density   |
| Standard:  | ASTM F2765              | Test Method: | Standard Test Method for Total Lead Content in Synthetic Turf Fibers  |

**SAMPLING PLAN:**

|   |            |
|---|------------|
| Sampling Date:  | 10/13/2015 |
| <ul style="list-style-type: none"> <li>Specimen sampling is performed in the sampling department at TSI beside the ground level dock door.</li> <li>The sampling size of specimens is determined by the test method requirements.</li> <li>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.</li> <li>All samples are subjected to the outside environmental conditions of temperature and relative humidity.</li> <li>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</li> </ul> |            |

**DEVIATION FROM TEST METHOD(S):**

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

|               |   |                |             |
|---------------|---|----------------|-------------|
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| Release Date: | Control Type: Electronic – Expires 24 hours after this date: Oct. 29, 15<br>Printed copies are uncontrolled |                |             |



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 PHONE: (706) 226-1400 • FAX: (706) 226-6118

## TEST SUMMARY

**CLIENT:**

|                      |                           |                         |                       |
|----------------------|---------------------------|-------------------------|-----------------------|
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| <b>Address:</b>      | 185 South Industrial Blvd | <b>Lab Test Number:</b> | 2757-5431             |
|                      | Mail Drop ODY-22          | <b>Test Date:</b>       | 10/13/2015-10/28/2015 |
|                      | Calhoun, GA 30701         | <b>Report Date:</b>     | 10/28/2015            |
|                      |                           | <b>Page:</b>            | 2 of 3                |
| <b>Requested By:</b> | Riley Lawson              |                         |                       |

**TEST MATERIAL:**

|                            |                          |     |              |                       |                  |
|----------------------------|--------------------------|-----|--------------|-----------------------|------------------|
| <b>Material Type:</b>      | Slit Film Synthetic Turf |     |              | <b>Date Received:</b> | 10/13/2015       |
| <b>Material Condition:</b> | <b>EXCELLENT:</b>        | XXX | <b>GOOD:</b> | <b>POOR:</b>          | <b>REJECTED:</b> |
| <b>Product ID. Number:</b> | TF964 Lyman Hall         |     |              |                       |                  |
| <b>Roll #:</b>             | TT00NUW                  |     |              |                       |                  |

**TEST SUMMARY:**

| TEST METHOD  |            | TEST DESCRIPTION                               | TEST RESULT |       |       |       |       |        |        |
|--------------|------------|--|-------------|-------|-------|-------|-------|--------|--------|
|              |            |  | Green       | Red   | White | Black | Blue  | Yellow | Orange |
| Yarn Testing | ASTM D1907 | Yarn Denier                                    | 5,055       | 5,121 | 5,222 | 5,035 | 5,301 | 5,216  | 5,559  |
|              | ASTM D3218 | Filament Thickness (microns)                   | Green       | Red   | White | Black | Blue  | Yellow | Orange |
|              |            |  | 105         | 109   | 105   | 102   | 102   | 95     | 112    |
|              | ASTM D2256 | Yarn Breaking Strength (lbs/force)             | Green       | Red   | White | Black | Blue  | Yellow | Orange |
|              |            |  | 17.7        | 12.06 | 12.14 | 11.14 | 10.36 | 11.13  | 13.47  |
|              | ASTM F2765 | Lead Content (ppm) @ 210°C Microwave Digestion | Green       | Red   | White | Black | Blue  | Yellow | Orange |
|              |            |  | 6.42        | 37.0  | 11.6  | 12.0  | 9.73  | 11.7   | 13.3   |
|              | ASTM D7138 | Fiber Melt Point (°C)                          | Green       | Red   | White | Black | Blue  | Yellow | Orange |
|              |            |  | 120         | 120   | 120   | 120   | 120   | 120    | 120    |

| TEST METHOD     |                     | TEST DESCRIPTION                    | TEST RESULT               |                     |
|-----------------|---------------------|-------------------------------------|---------------------------|---------------------|
| Product Testing | ASTM D5848          | Total Product Weight                | 86.65 oz/lyd <sup>2</sup> |                     |
|                 | ASTM D5848          | Pile Yarn Weight                    | 55.26 oz/lyd <sup>2</sup> |                     |
|                 | ASTM D5848          | Primary Backing Weight              | 8.19 oz/lyd <sup>2</sup>  |                     |
|                 | ASTM D5848          | Secondary Backing Weight            | 23.20 oz/lyd <sup>2</sup> |                     |
|                 | ASTM D5823          | Average Pile Height                 | 2.52"                     |                     |
|                 | ASTM D1335          | Average Tuft Bind Strength          | 19.9 lbs/force            |                     |
|                 | ASTM D5034          | Average Grab Tear Strength (Length) | 286.1 lbs/force           |                     |
|                 | ASTM D5034          | Average Grab Tear Strength (Width)  | 235.5 lbs/force           |                     |
|                 | ASTM D5793          | Stitch Count                        | Gauge                     | 3.0 stitches per 1" |
| TSI Internal    | Perforation Spacing | Perforation Diameter                | 3" W X 4"L                | 0.25"               |

| TEST METHOD         |                       | TEST DESCRIPTION   | TEST RESULT     |                           |                    |      |
|---------------------|-----------------------|--|-----------------|---------------------------|--------------------|------|
| Performance Testing | ASTM D2859            | Pill Flammability  | 8 of 8 Pass     | Meets 16CFR 1630 (FF1-70) |                    |      |
|                     | ASTM D3385            | Infiltrometer Drainage Rate                                | 68 inches/hour  |                           |                    |      |
|                     | ASTM F355a            | Impact Attenuation Gmax                                    | 93              |                           |                    |      |
|                     | ASTM F1292            | Impact Attenuation @ 1.3 Meters (HIC) Head Injury Criteria | Gmax            | HIC                       |                    |      |
|                     |                       |  | 185             | 956                       |                    |      |
|                     | ASTM F1015            | Abrasive Index   | 41              |                           |                    |      |
|                     | ASTM F1551            | Football Shoe Traction                                     | Dry Surface     |                           | Wet Surface        |      |
|                     |                       |  | Static          | 1.57                      | Static             | 1.41 |
|                     |                       |  | Dynamic         | 0.99                      | Dynamic            | 0.85 |
|                     | EN14808               | Shock Absorption (Force Reduction)                         | Force Reduction |                           | Energy Restitution |      |
| 62.0 %              |                       |  | 40.0 %          |                           |                    |      |
| EN14809             | Vertical Deformation  | 9mm  |                 |                           |                    |      |
| EN15301             | Rotational Resistance | Dry Surface  |                 | Wet Surface               |                    |      |
|                     |                       | 36 newton/meter  |                 | 39 newton/meter           |                    |      |

- Infill System: 3.9 lbs/ft<sup>2</sup> Sand Mixed with 3.9 lbs/ft<sup>2</sup> Crumb Rubber
- Test Base: Concrete

|                      |   |                       |                    |
|----------------------|---|-----------------------|--------------------|
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| Product ID. Number: | TF964 Lyman Hall         |     |       |                |            |
| Roll #:             | TT00NUW                  |     |       |                |            |

**TEST SUMMARY: Cont'd**

| TEST METHOD    |            | TEST DESCRIPTION                            | TEST RESULT              |              |                            |            |
|----------------|------------|---|--------------------------|--------------|----------------------------|------------|
| Infill Testing | EN1969     | Infill Depth Measurement                    | Pile Height              | Infill Depth | % of Pile Height           |            |
|                |            |   | 64 mm                    | 52 mm        | 81 %                       |            |
|                | EN933      | Particle Size Distribution                  | Rubber                   |              | Sand                       |            |
|                |            |   | 10-20 US Sieve           |              | 20-40 US Sieve             |            |
|                | EN14955    | Particle Shape                              | Rubber                   |              | Sand                       |            |
|                |            |   | 100% Angular             |              | 50% Round<br>50% Irregular |            |
|                | EN1097     | Particle Density                            | Rubber                   |              | Sand                       |            |
|                |            |   | 0.4923 g/cm <sup>3</sup> |              | 1.7968 g/cm <sup>3</sup>   |            |
|                | ASTM F2765 | Lead Content<br>@ 210°C Microwave Digestion | Rubber                   |              |                            |            |
|                |            |   |                          |              |                            | 15.7 mg/Kg |

**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.

TSI can only ensure the test results for the specific items tested.

Unless otherwise noted in the deviations sections of this report all tests performed are in compliance with stated test method.

**Test Report Approval:**

Erle Miles, Jr. VP, Testing Services Inc

TSI is a certified independent testing laboratory by the Synthetic Turf Council

End of Report

|               |   |                |             |
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