



TESTING
— SERVICES —

*Accessibility of Surface Systems Under and Around Playground
Equipment*

ASTM F1951-21

Material ID: K9 Eco

Report #: 98176F

Report Date: January 26, 2026

Client: ForeverLawn

8007 Beeson St

Louisville, OH 44641



Test Report Approval:

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

TSI Accreditation:

Testing Services LLC is a scientific body member of ISSS (International Sports Surface Science Society), ASTM and the Synthetic Turf Council.



TESTING

SERVICES

Report #: 98176F	Report Date:	1/26/2026
	Test Period:	1/9/2026-1/11/2026
System Description		
Turf Identification:	K9 Eco	
Infill:	None	
Padding:	None	
Subbase	3" of 57 Stone and 1" of 3/8" Angular Stone	

Test Scope: *Testing Services was instructed by the client to perform ASTM F1951, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.*

This specification outlines minimum characteristics which determine accessibility for all types of materials that can be used as the accessible route through the play area, and under and around playground equipment. Playground surface materials and systems installed, must comply with the technical provisions for the accessible route, and clear ground space including running slope, cross slope, openings in the surface, changes in level, pile height, firmness, and stability. The accessible surface performance criteria apply to the site or play surface sample to be tested, in accordance with the 2010 ADA Standards for Accessible Design.

Requirement: *A surface in place shall have average work per foot (work per meter) values for straight propulsion and for turning less than the average work per foot (work per meter) values for straight propulsion and for turning, respectively, on a hard, smooth, surface with a grade of 1:14 (7.1 %).*

Sampling Plan: *The above referenced Artificial Turf was received at Testing Services laboratory on January 9, 2026. The test materials were acclimated to the appropriate temperatures as outlined in the test method prior to testing.*

Test Apparatus: Wheelchair/Operator:
The wheelchair used in these tests was manufactured by Invcare, Model Action Xtra, Serial Number 98J84142. This wheelchair is totally adjustable, a necessity for this test. The pneumatic tires were inflated to 60 psi on the rear and 32 psi on the front. The weight of the wheelchair was 24.25 pounds and the operator's weight were 165 pounds for a total of 189 pounds. The operator's distribution was adjusted to 60% on the rear wheels and 40 % on the front.

Torque Measuring System: *A certified calibrated Andilog Centor Easy II TW Force Gauge and 150 N/m Smart Torque Wrench, S/N 250108, was used as an interface to an Acer Laptop. Caligraph Software from Andilog logged the load vs. time and integrated the area under the resulting curves. The adapters and accessories needed to attach the instrumentation were fabricated locally. The total package added 10 pounds to the total weight, bringing the total to 199 pounds.*

Deviation from Method: *None*

Decision Rule: *No consideration of uncertainty was taken in our statement of compliance.*



TEST DATA

Surface Preparation & Testing:

Tests were conducted on 1/9/2026 in an environmental condition of 76°F, 66 % RH.
 A 4' X 10' section of the submitted Artificial Turf was cut
 and positioned into a containing wood frame box of similar dimensions with a concrete subbase.

TEST SUMMARY:

TEST METHOD	Maximum Requirements – Average Work/ft-Force	TEST RESULTS – Average Work/ft-Force
ASTM F1951-21	Baseline Straight: 15.00 lbs	11.69 lbs
	Baseline Turning: 9.38 lbs	5.38 lbs

Straight Propulsion	1	2	3	4	5
Circumference of Rear Wheel	75.375"	75.375"	75.375"	75.375"	75.375"
Area	46.7710 ft ² *lbs*s	50.8070 ft ² *lbs*s	42.8110 ft ² *lbs*s	40.8600 ft ² *lbs*s	55.5940 ft ² *lbs*s
Time	8.00 seconds	8.01 seconds	8.00 seconds	8.01 seconds	8.01 seconds
Distance	86.0 inches				
Distance	7.17 ft				
Angular Displacement (radians)	7.17 rad				
Average Torque (energy)	5.84 ft lbs	6.34 ft lbs	5.34 ft lbs	5.10 ft lbs	6.94 ft lbs
Total Work (energy)	83.78 ft lbs	90.94 ft lbs	76.65 ft lbs	73.19 ft lbs	99.54 ft lbs
Work/ft (force)	11.69 lbs	12.69 lbs	10.70 lbs	10.21 lbs	13.88. lbs
Drop Hi/Low Work/ft (force)		12.69 lbs	10.70 lbs		
Average Work/ft (force)			11.69 lbs		

Turning Propulsion	1	2	3	4	5
Circumference of Rear Wheel	75.375"	75.375"	75.375"	75.375"	75.375"
Distance from Pivot Point to Outer Wheel	35.75 inches				
Area	44.1620 ft ² *lbs*s	42.1100 ft ² *lbs*s	44.7010 ft ² *lbs*s	42.1890 ft ² *lbs*s	41.9000 ft ² *lbs*s
Time	8.00 seconds	8.01 seconds	8.01 seconds	8.01 seconds	8.00 seconds
Angle Traveled (degrees)	93.0°	93.0°	93.0°	93.0°	93.0°
Angle Traveled (radians)	1.62 rad				
Arc Length Traveled by Outer Wheel	58.03 inches				
Arc Length Traveled by Outer Wheel	4.84 ft				
Angular Displacement of Outer Wheel (radians)	4.84 rad				
Average Torque (energy)	5.52 ft lbs	5.26 ft lbs	5.58 ft lbs	5.27 ft lbs	5.24 ft lbs
Total Work (energy)	26.70 ft lbs	25.43 ft lbs	27.00 ft lbs	25.49 ft lbs	25.33 ft lbs
Work/ft (force)	5.52 lbs	5.26 lbs	5.58 lbs	5.27 lbs	5.24 lbs
Drop Hi/Low Work/ft (force)	5.52 lbs	5.26 lbs		5.27 lbs	
Average Work/ft (force)			5.35 lbs		

CONCLUSION:

The above listed material meets/exceeds both the straight line and turning propulsion requirements in accordance with ASTM F1951, where the surface tested average work per foot value was less than the average work per foot value verses a hard, smooth surface with a grade of 7.1%

END OF REPORT