



Lab Testing Report

ASTM F1951-14

Sample Reference	2" Turf with Brockfill	Job Number	91194
Client Information	Brock 3090 Sterling Circle, Suite 102, Boulder, CO, 80301	Daybook Number	1314
		Issue Date	05/11/2020
		Test Date	04/29/2020
Materials Description	2" mono / slit / thatch fiber infilled with Brockfill and sand Over Brock Powerbase		

Report Status	Final	
Prepared By	Mark Korvas	
Checked By	Kieran O'Donnell	

Introduction:

Artificial Turf samples submitted by the manufacturer for testing and analyzed in accordance with the test methods listed below.

Test Methods:

- **ASTM F1951-14:** *Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.*

Forward

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System Information

Ambient Temp (F)	72	Surface Temp (F)	71
Carpet Type	2" mono/slit/thatch	Humidity (%)	55
Performance Infill Type	Brockfill	Performance Infill Rate	1 Lbs Square Foot
Stabilizing Infill Type	20/40 Silica Sand	Stabilizing Infill Rate	4 Lbs Square Foot
Underlayment Type	Powerbase	Thickness (mm)	N/A
Sub-Base	3" Aggregate	Exposed Pile	30%

Test Apparatus Information

Wheelchair Model:	Invcare, Model Action Xtra		S/N: 98J84142
Tires	Front : 60 psi		Rear: 32 psi
Weights (Lbs):	Chair: 24.25	Operator: 165	Total: 189
Operator Distribution:	Rear: 60%		Font: 40%
Torque Measuring System	Mecmesin Advanced Force Gauge		Model 500N
	Smart Torque Wrench		S/N 97-0085-01
	Dell Laptop – Emperor Lite Software from Mecmesin		

Test Results Summary

Test Method		Test Results (Work/ft-Force)	Limits (Work/ft-Force)
ASTM F1951-14	Baseline Straight:	11.82	13.54
	Baseline Turning:	7.08	9.45



TESTING TECHNOLOGY FOR SPORT

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Test Results

Straight Propulsion	1	2	3	4	5
Circumference of Rear Wheel	75.375"	75.375"	75.375"	75.375"	75.375"
Area	46.9709 ft*lbs*s	43.9436 ft*lbs*s	48.3101 ft*lbs*s	45.6031 ft*lbs*s	44.8441 ft*lbs*s
Time	7.77 seconds	7.72 seconds	7.80 seconds	7.75 seconds	7.74 seconds
Distance	86.0 inches	86.0 inches	86.0 inches	86.0 inches	86.0 inches
Distance	7.17 ft	7.17 ft	7.17 ft	7.17 ft	7.17 ft
Angular Displacement (radians)	7.17 rad	7.17 rad	7.17 rad	7.17 rad	7.17 rad
Average Torque (energy)	6.05 ft lbs	5.69 ft lbs	6.19 ft lbs	5.88 ft lbs	5.79 ft lbs
Total Work (energy)	86.67 ft lbs	81.61 ft lbs	88.80 ft lbs	84.37 ft lbs	83.07 ft lbs
Work/ft (force)	12.09 lbs	11.39 lbs	12.39 lbs	11.77 lbs	11.59 lbs
Drop Hi/Low Work/ft (force)	12.09 lbs			11.77 lbs	11.59 lbs
Average Work/ft (force)	11.82 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	35.75 inches	35.75 inches	35.75 inches	35.75 inches
Area	57.7535 ft*lbs*s	53.5377 ft*lbs*s	53.5360 ft*lbs*s	52.7353ft*lb*s	57.4359 ft*lbs*s
Time	7.77 seconds	7.74 seconds	7.74 seconds	7.72 seconds	7.76 seconds
Angle Traveled (degrees)	92.0°	92.0°	92.0°	92.0°	92.0°
Angle Traveled (radians)	1.61 rad	1.61 rad	1.61 rad	1.61 rad	1.61 rad
Arc Length Traveled by Outer Wheel	57.40 inches	57.40 inches	57.40 inches	57.40 inches	57.40 inches
Arc Length Traveled by Outer Wheel	4.78 ft	4.78 ft	4.78 ft	4.78 ft	4.78 ft
Angular Displacement of Outer Wheel (radians)	4.79 rad	4.79 rad	4.79 rad	4.79 rad	4.79 rad
Average Torque (energy)	7.43 ft lbs	6.92 ft lbs	6.92 ft lbs	6.83 ft lbs	7.40 ft lbs
Total Work (energy)	35.57 ft lbs	33.10 ft lbs	33.10 ft lbs	32.69 ft lbs	35.42 ft lbs
Work/ft (force)	7.44 lbs	6.92 lbs	6.92 lbs	6.83 lbs	7.40 lbs
Drop Hi/Low Work/ft (force)		6.92 lbs	6.92 lbs		7.40 lbs
Average Work/ft (force)	7.08 lbs				

Conclusion: The above listed material meets/exceeds both the straight line and turning propulsion requirements set forth in this test, 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 ***



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