



CLIENT:

Company:	Realturf USA	Report Number:	82399
Address:	10215 S Sam Houston Pkwy W.	Lab Test Number:	3249-5894
	Missouri City, TX 77489	Test Dates:	March 4-12, 2021
		Report Date:	3/19/2021
Phone #	713-474-0465	Page:	1 of 3
Requested By:	Vjekoslav Stipanac		

TEST MATERIAL:

Material Type:	Synthetic Turf with infill over pad	Date Received:	2/11/2021
Turf ID:	Realturf 70 oz	Pad ID:	2 1/4" Polygreen Foam, closed cell polyethylene
Turf Manufacturer Date:	Unknown	Pad Manufacturer Date:	Unknown
Infill:	2.0 lbs/ft ² 20/40 Silica Sand	Subbase:	3" #57 Stone

TESTING METHODS REQUESTED:

Testing Services Inc. was instructed by the client to test for the following...			
Standard:	ASTM F1292	Test Method:	Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment

SAMPLING PLAN:

Sampling Date:	3/1/2021
- Realturf delivered (1) synthetic turf sample measuring approximately 15' wide x 4' long, plus (2) 4' wide x 8' long sheets of pad, which all samples were cut from - Samples were cut for testing to determine least favorable impact location which includes full turf and pad samples, plus seamed turf and pad samples	

TEST APPARATUS:

- Triax 2015 E Missile System, manufactured by Alpha Automation, Inc. - Accelerometer #1488 manufactured by Dytran, Calibration Date 2/12/2020, Recalibration Due Date 2/12/2022

DEVIATION FROM TEST METHOD:

State Reason for any Deviation, Additions to, or Exclusions from Test Method
None

TEST SUMMARY:

Test Method	Condition		Gmax	HIC	Fall Height
ASTM F1292-18	Ambient, Dry	72°F	136	884	8'
	Hot, Dry	120°F	145	953	9'
	Frozen	25°F	141	893	8'

Critical Fall Height < 200 Gmax < 1000 HIC, All Temperature Ranges	8'
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Least Favorable Impact Location was determined to be at full piece of turf, center of pad. All temperature ranges were completed at this location.

Per the test method, the laboratory test used to determine critical fall height of materials specified for use in a playground shall have been conducted no more than five years prior to the date of installation of the playground surface.

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

The results reported herein reflect the performance of the described samples at the time of testing and at the temperature(s) reported. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently.

Test Performed by: _____ Test Report Approved by: _____
Nathan Lomax, Testing Specialist, Testing Services (TSI), LLC Erle Miles, III, Lab Director, Testing Services (TSI) LLC



TEST REPORT

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Address:	10215 S Sam Houston Pkwy W.	Lab Test Number:	3249-5894
	Missouri City, TX 77489	Test Dates:	March 4-12, 2021
		Report Date:	10/21/2020
Phone #	706-847-1111	Page:	2 of 3
Requested By:	Vjekoslav Stipanic		

TEST MATERIAL:

Material Type:	Synthetic Turf with infill over pad	Date Received:	2/11/2021
Turf ID:	Realturf 70 oz	Pad ID:	2 1/4" Polygreen Foam, closed cell polyethylene
Turf Manufacturer Date:	Unknown	Pad Manufacturer Date:	Unknown
Infill:	2.0 lbs/ft ² 20/40 Silica Sand	Subbase:	3" #57 Stone

TEST DATA: (Average is drop 2 & 3, Drop 1 is for conditioning only)

Impact Location:				Center Turf/Center Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	8	8'	125	844
2	22.8	4	8'	132	870
3	22.8	8	8'	139	897
Surface temperature after final drop in this series			72.8°	AVERAGE Gmax/HIC	136
Percentage (%) of maxium allowable values (g-max and HIC):				68%	88%
Impact Location:				Center Turf/Seam Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	4	8'	120	732
2	22.8	9	8'	134	832
3	22.8	6	8'	140	877
Surface temperature after final drop in this series			72.9°	AVERAGE Gmax/HIC	137
Percentage (%) of maxium allowable values (g-max and HIC):				68%	84%
Impact Location:				Center Turf/T-seam intersection Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	2	8'	128	823
2	22.8	7	8'	136	856
3	22.8	5	8'	138	863
Surface temperature after final drop in this series			71.6°	AVERAGE Gmax/HIC	137
Percentage (%) of maxium allowable values (g-max and HIC):				68%	86%
Impact Location:				Seam Turf/Center Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	6	8'	112	664
2	22.8	7	8'	125	757
3	22.8	8	8'	126	769
Surface temperature after final drop in this series			71.3°	AVERAGE Gmax/HIC	126
Percentage (%) of maxium allowable values (g-max and HIC):				73%	76%
Impact Location:				Seam Turf/Seam Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	6	8'	120	739
2	22.8	6	8'	130	815
3	22.8	5	8'	131	817
Surface temperature after final drop in this series			71.6°	AVERAGE Gmax/HIC	131
Percentage (%) of maxium allowable values (g-max and HIC):				65%	82%
Impact Location:				Seam Turf/T-seam intersection Pad	
Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
1	22.8	9	8'	116	692
2	22.8	4	8'	125	756
3	22.8	8	8'	126	763
Surface temperature after final drop in this series			71.5°	AVERAGE Gmax/HIC	126
Percentage (%) of maxium allowable values (g-max and HIC):				73%	76%
Least Favorable Impact Location was determined to be at center of turf, center of pad. Remaining testing were completed at this location.					



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TEST DATA: (Average is drop 2 & 3, Drop 1 is for conditioning only)

IMPACT LOCATION: Center Turf/Center of Pad

CONDITIONS	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
Ambient Air Temperature: 63°F	1	21.4	9	7'	106	557
	2	21.4	7	7'	117	644
	3	21.4	7	7'	119	661
	Surface temperature after final drop in this series 72.9°			AVERAGE Gmax/HIC	118	653
Reference Surface Temperature: 72°F	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	22.8	4	8'	125	844
	2	22.8	6	8'	132	870
	3	22.8	5	8'	139	897
	Surface temperature after final drop in this series 72.8°			AVERAGE Gmax/HIC	136	884
Test Date: 3/4/2021	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	24.2	7	9'	132	882
	2	24.2	6	9'	143	977
	3	24.2	6	9'	154	1051
	Surface temperature after final drop in this series 72.7°			AVERAGE Gmax/HIC	149	1014

CONDITIONS	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
Ambient Air Temperature: 66°F	1	22.9	7	8'	119	717
	2	22.9	6	8'	128	764
	3	22.9	6	8'	132	808
	Surface temperature after final drop in this series 122.3°			AVERAGE Gmax/HIC	130	786
Reference Surface Temperature: 120°F	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	24.2	7	9'	130	838
	2	24.3	6	9'	139	892
	3	24.3	8	9'	151	1014
	Surface temperature after final drop in this series 122.4°			AVERAGE Gmax/HIC	145	953
Minimum 115°F	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	25.5	8	10'	143	989
	2	25.5	5	10'	147	1014
	3	25.5	6	10'	164	1203
	Surface temperature after final drop in this series 122.0°			AVERAGE Gmax/HIC	156	1109

CONDITIONS	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
Ambient Air Temperature: 65°F	1	21.3	5	7'	113	626
	2	21.4	8	7'	126	726
	3	21.4	5	7'	131	763
	Surface temperature after final drop in this series 27.0°			AVERAGE Gmax/HIC	129	745
Reference Surface Temperature: 25°F	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	22.8	4	8'	124	751
	2	22.8	4	8'	139	874
	3	22.8	6	8'	142	912
	Surface temperature after final drop in this series 26.1°			AVERAGE Gmax/HIC	141	893
Maximum 30°F	Drop	Velocity (ft/sec)	Angle	Drop Height	Gmax	HIC
	1	24.2	5	9'	136	963
	2	24.2	6	9'	152	1071
	3	24.2	5	9'	161	1147
	Surface temperature after final drop in this series 25.8°			AVERAGE Gmax/HIC	157	1109