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TEST REPORT SP1697a

DETERMINATION OF CRITICAL FALL HEIGHT (HIC) PROPERTIES TO EN1177:2018 :

“Joyful Grass + Prefabricated shockpad”

Applicant:

**Trocellen Group
Mulheimer Strasse 26
53840 Troisdorf
Germany**

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- *This report is confidential to the client and Surface Performance Ltd accept no responsibility towards any third parties to whom this report is made available to. Any such party relies upon this report at their own risk.*
- *This report shall not be used for contractual purposes unless signed by the Laboratory Manager*

PREPARED BY	SIGNATURE	ISSUE DATE	REPORT NUMBER
Ronny Wilson (Laboratory Manager)		03.09.2018	1697a





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2.0 SUMMARY OF TESTING (Laboratory Tests)

** Denotes a test outside the scope of ISO 17025 accreditation*

To be read in conjunction with this report

2.1 Determination of Critical Fall Height (HIC) in accordance with EN1177:2018.

2.2 Determination of Particle Size Distribution in accordance with BS EN933-1:2012.





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3.0 INTRODUCTION

Surface Performance Ltd carried out testing of the determination of the critical fall height (HIC) to a sample of artificial grass overlaid on varying thicknesses of prefabricated shockpad. A silica sand of grain size 0.315 - 0.8 mm was used to fill the samples.

The 1.0m x 1.0m samples were received at the laboratory on 17th August 2018.

The samples were identified with Surface Performance Ltd as SP1697a.

The samples were prepared and conditioned for 24 hours prior to all testing in accordance with ISO 291 Class 2 (non tropical countries).

This test report only refers to the sample stated on Page 1.

4.0 TEST PROGRAMME

The determination of the HIC was conducted as described in EN 1177:2018.

The following test systems were tested:

- System 1** “Joyful” Artificial turf carpet, filled with 5 kg/m² sand, laid loose on a 20mm thick shockpad.
- System 2** “Joyful” Artificial turf carpet, filled with 5 kg/m² sand, laid loose on a 30mm thick shockpad
- System 3** “Joyful” Artificial turf carpet, filled with 5 kg/m² sand, laid loose on a 40mm thick shockpad
- System 4** “Joyful” Artificial turf carpet, filled with 5 kg/m² sand, laid loose on a 50mm thick shockpad
- System 5** “Joyful” Artificial turf carpet, filled with 5 kg/m² sand, laid loose on a 60mm thick shockpad





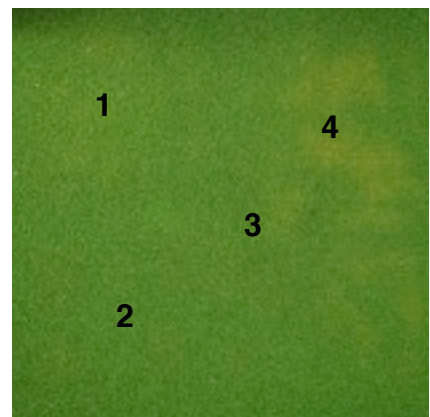
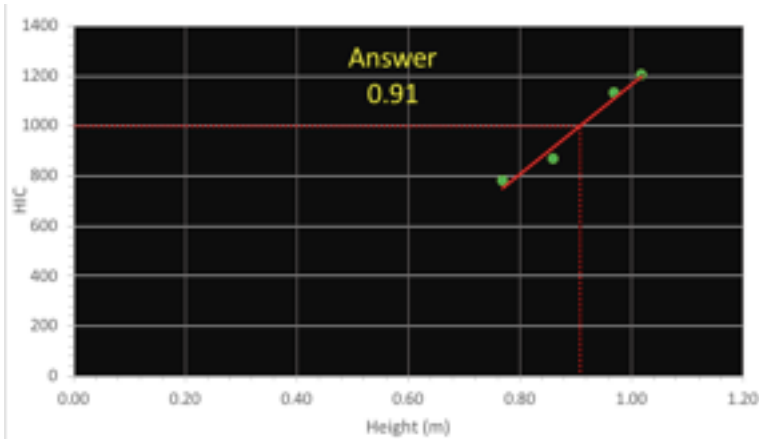
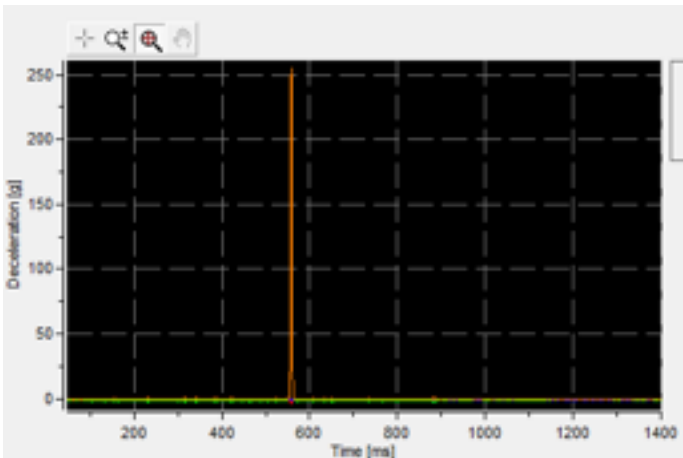
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4.0 TEST RESULTS

4.1 System 1: Joyful Grass + 5kg/m² sand + 20mm Shockpad

Surface Temp °C	23.5	Air Temp °C	24.0
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Test Position	Fall Height (m)	Result (HIC)	CFH (m)
1	0.77	780	0.91
2	0.86	868	
3	0.97	1131	
4	1.02	1204	



Clockwise from top left: Time/Acceleration curve of impact over 1000 HIC, Cross section of Variant, Test Location Plan, Determination of HIC value curve



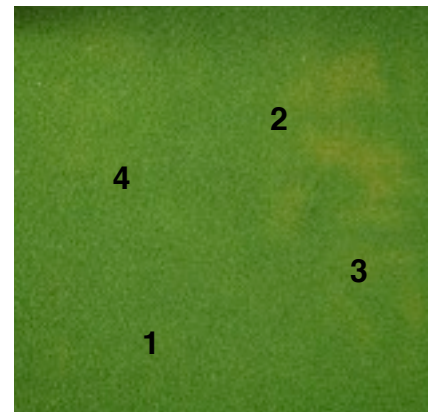
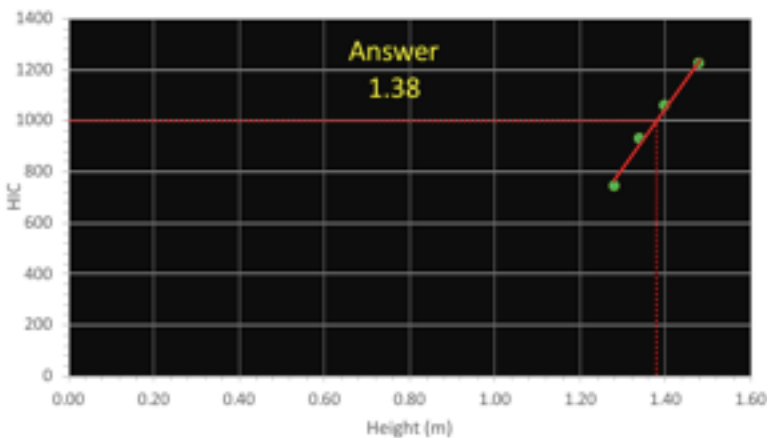
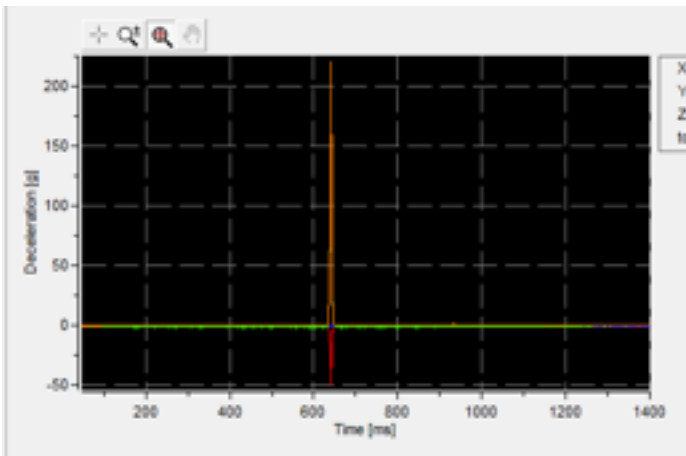


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4.2 System 2: Joyful Grass + 5kg/m² sand + 30mm Shockpad

Surface Temp °C	23.6	Air Temp °C	24.0
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Test Position	Fall Height (m)	Result (HIC)	CFH (m)
1	1.28	745	1.38
2	1.34	931	
3	1.40	1059	
4	1.48	1221	



Clockwise from top left: Time/Acceleration curve of impact over 1000 HIC, Cross section of Variant, Test Location Plan, Determination of HIC value curve

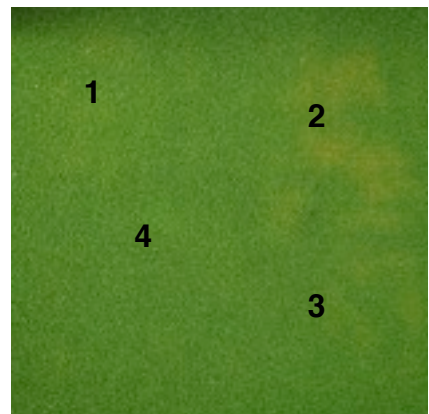
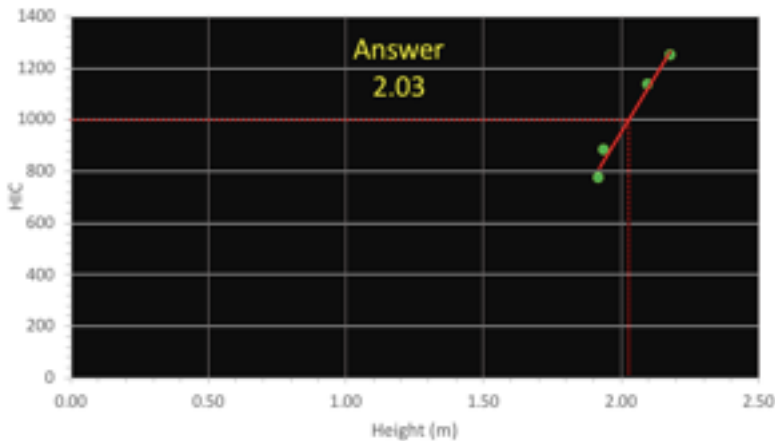
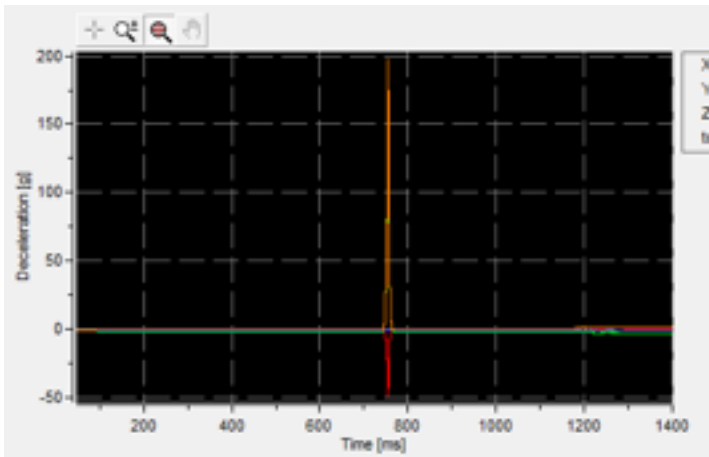


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4.3 System 3: Joyful Grass + 5kg/m² sand + 40mm Shockpad

Surface Temp °C	24.8	Air Temp °C	24.0
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Test Position	Fall Height (m)	Result (HIC)	CFH (m)
1	1.92	774	2.03
2	1.94	883	
3	2.10	1136	
4	2.18	1249	



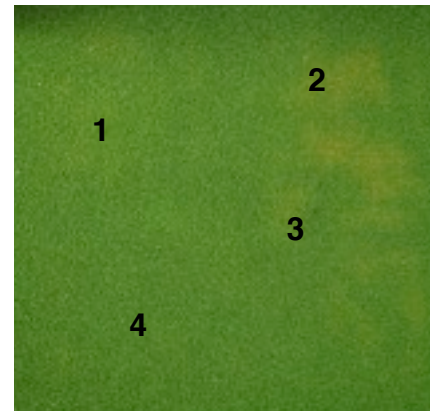
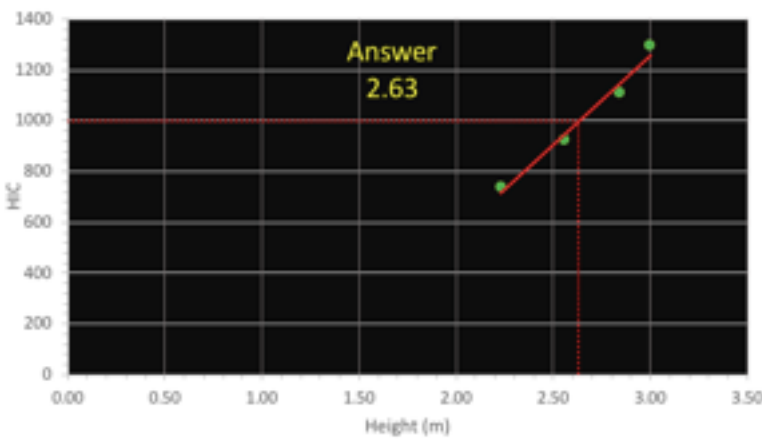
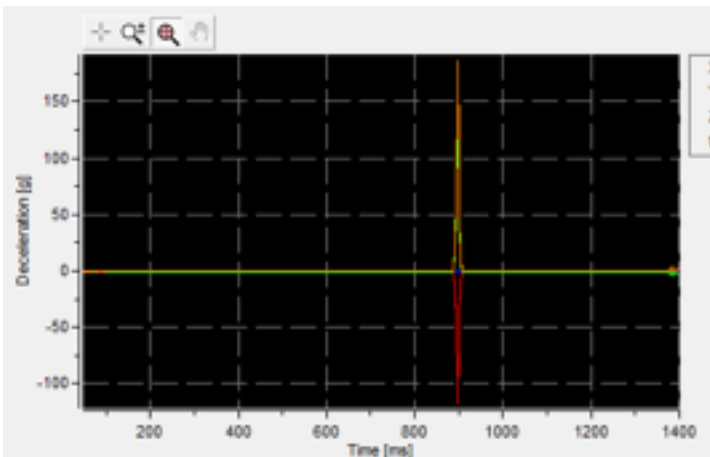
Clockwise from top left: Time/Acceleration curve of impact over 1000 HIC, Cross section of Variant, Test Location Plan, Determination of HIC value curve



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4.4 System 4: Joyful Grass + 5kg/m² sand + 50mm Shockpad

Surface Temp °C	25.1	Air Temp °C	24.0
Test Position	Fall Height (m)	Result (HIC)	CFH (m)
1	2.23	738	2.63
2	2.56	926	
3	2.84	1111	
4	3.00	1296	



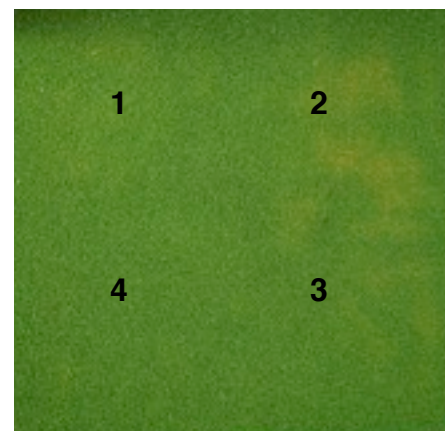
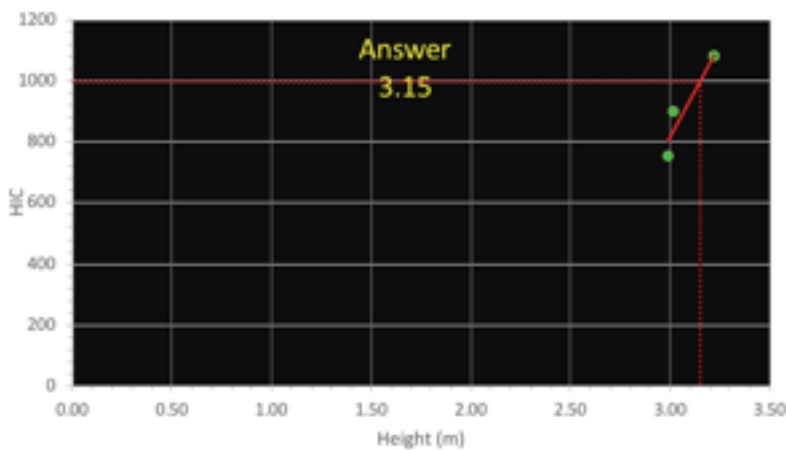
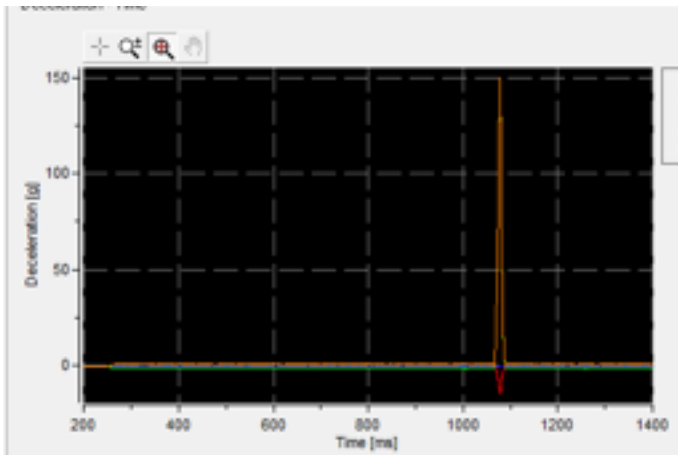
Clockwise from top left: Time/Acceleration curve of impact over 1000 HIC, Cross section of Variant, Test Location Plan, Determination of HIC value curve



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4.5 System 5: Joyful Grass + 5kg/m² sand + 60mm Shockpad

Surface Temp °C	26.6	Air Temp °C	24.0
Test Position	Fall Height (m)	Result (HIC)	CFH (m)
1	2.99	750	3.15
2	3.02	897	
3	3.22	1080	
4	System exceeded maximum test height		



Clockwise from top left: Time/Acceleration curve of impact over 1000 HIC, Cross section of Variant, Test Location Plan, Determination of HIC value curve



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4.6 Particle Size Distribution

Particle Grain Size: 0.315 - 0.8 mm

Sieve Size	% Retained in Sieve	Passing %
0.000	1.53%	0.00%
0.200	0.10%	1.53%
0.315	29.42%	1.63%
0.500	41.55%	31.05%
0.630	27.10%	72.60%
0.800	0.26%	99.69%
1.000	0.05%	99.95%
1.250	0.00%	100.00%
1.600	0.00%	100.00%
2.000	0.00%	100.00%
2.500	0.00%	100.00%
3.150	0.00%	100.00%
4.000	0.00%	100.00%
% of data within Measured range		
98.32%		

5.0 Summary of Results

Variant	CFH (m)
1 - Joyful + 20mm Shockpad	0.91
2 - Joyful + 30mm Shockpad	1.38
3 - Joyful + 40mm Shockpad	2.03
4 - Joyful + 50mm Shockpad	2.63
5 - Joyful + 60mm Shockpad	3.15



Report Number: SP1697a

Project Reference: Joyful Grass



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END OF TEST REPORT

