

FIELD TEST
REPORT



TESTING TECHNOLOGY FOR SPORT

UNIVERSITY OF WARWICK

SWAB TESTING OF RLU



REPORT STATUS 'FINAL'

ISSUE DATE 09.01.2025

REPORT NUMBER 24892/7772s/4



+44 (0)1506 444 755



WWW.SPORTSLABS.CO.UK



INFO@SPORTSLABS.CO.UK

FOREWORD & LABORATORY DETAILS

LABORATORY DETAILS

Sports Labs Ltd.
 1 Adam Square
 Brucefield Industry Park
 Livingston, EH54 9DE
 Scotland, United Kingdom
 +44 1506 444 755 | info@sportslabs.co.uk

CLIENT DETAILS

Grassfitt Limited,
 Unit 1, Squires farm Industrial Estate,
 Palehouse Common,
 TN22 5RB.
 United Kingdom
 +44 1825 627199 | info@grassfitt.com

FOREWORD

This report has been prepared by Sports Labs Ltd with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it.

This report is confidential to the Client, and Sports Labs Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

This report shall not be used for engineering or contractual purposes unless signed by the Author and the Checker and the report status is "Final". Draft reports may be subject to change.

The report shall not be reproduced except in full without approval of the laboratory and provide assurance that parts of a report are not taken out of context.

The results and conclusions documented in this report are valid only as of the date of testing and within the specific conditions tested. Any changes in the testing environment, materials, equipment, or procedures could potentially affect the accuracy and relevance of the results. As such, the conclusions and data contained in this report may not necessarily apply to different circumstances or times, with testing carried out in accordance with the relevant specification(s).

The compliance requirement limit(s) applied and reported will be considered in conformance with the specified requirements if the measured value falls within the established specification limits. Specifically, if the measurement lies within the range of the Lower Specification Limit, and Upper Specification Limit, the result will be accepted as meeting the required criteria. If the measurement result falls outside this range, the result will be rejected as non-conforming.

Measurement uncertainty is not applied as a guard band in this decision-making process.

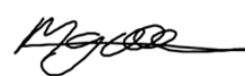
This report is not an official National Governing Body report and does not imply NGB approval.

REPORT CREATED BY



Niall MacPhee
 Director
 17th December 2024

REPORT CHECKED BY



Michael Gillespie
 Field Manager
 17th December 2024

Revision Number: N/A
 Date: N/A

Note of Amendment: N/A
 This report supersedes previous Report No. N/A

EXECUTIVE SUMMARY

Sports Labs Ltd were requested by their client Grassfitt Limited to carry out swab testing at the University of Warwick.

Testing was carried out to determine the impact of applying a coating agent on the Relative Light Units (RLU) detected. This is the luminescence-based metric used to assess surface cleanliness by detecting ATP (Adenosine Triphosphate) levels. Higher RLU values generally indicate higher levels of contamination. More detail on ATP and RLU can be read in Appendix 2.

Grassfitt Limited identified locations on each sports surface and provided information that the applicator had been applied on the 24th of October 2024 by Replay Maintenance Ltd with dry weather conditions at 11°C with morning dew. This had been applied prior to the visit of Sports Labs Ltd.

The measuring unit was a Hygeina Ensure Touch and the surfaces measured were a hockey surface (Wet), a hockey surface (Dry), an athletics track and an artificial turf pitch. They are identified in the location plan in Appendix 1.

In the absence of a European or international tolerances for sports surfaces, for upper limits we have reported results as below as a traffic light system. These have been supplied by Grassfitt Limited with supporting references and literature in Appendix 2 from the American Library of Medicine.

Very Clean	< 100
Clean	100 - 250
Attention Needed / Equivocal	250 – 500
Dirty	> 500

For each surface 3 swabs were taken on the untreated surface and the average reported. This was done again on the treated surface.

The results across all surfaces demonstrated an improvement, reduction, in RLU. The average was an 86% reduction with a range of 72 – 93%.

Three of the treated surfaces moved from a ‘fail’ to ‘attention required’ with the other surface, the 3G pitch moving from ‘attention required’ to ‘pass’.

SITE DETAILS

<p>SITE ADDRESS University of Warwick Kirby Corner Road Coventry CV4 7AL</p> <p>VISIT DATE 31st October 2024</p>	<p>TECHNICIANS ON SITE James Cox Harvey Webb</p> <p>PRESENT DURING THE TESTING Bryn Lee BLC Sports Limited Mike Reeves Grassfitt Limited</p>
--	--

TEST CONDITIONS

	AM	PM
Ambient Temperature (°C)	12	N/A
Surface Temperature (°C)	17	N/A
Humidity (% RH)	92	N/A
Wind Speed (m/s)	0.3	N/A

TEST RESULTS

Wet Hockey Pitch		Units	Test Positions				
Surface Hygiene Swab Test	Untreated Surface	RLU (Relative Light Units)	1	2	3	Average	
			7399	432	766	2866	
	Treated Surface	RLU (Relative Light Units)	1	2	3	Average	% Change
			263	281	159	234	-92

Dry Hockey Pitch		Units	Test Positions				
Surface Hygiene Swab Test	Untreated Surface	RLU (Relative Light Units)	1	2	3	Average	
			136	863	766	588	
	Treated Surface	RLU (Relative Light Units)	1	2	3	Average	% Change
			130	84	289	168	-72

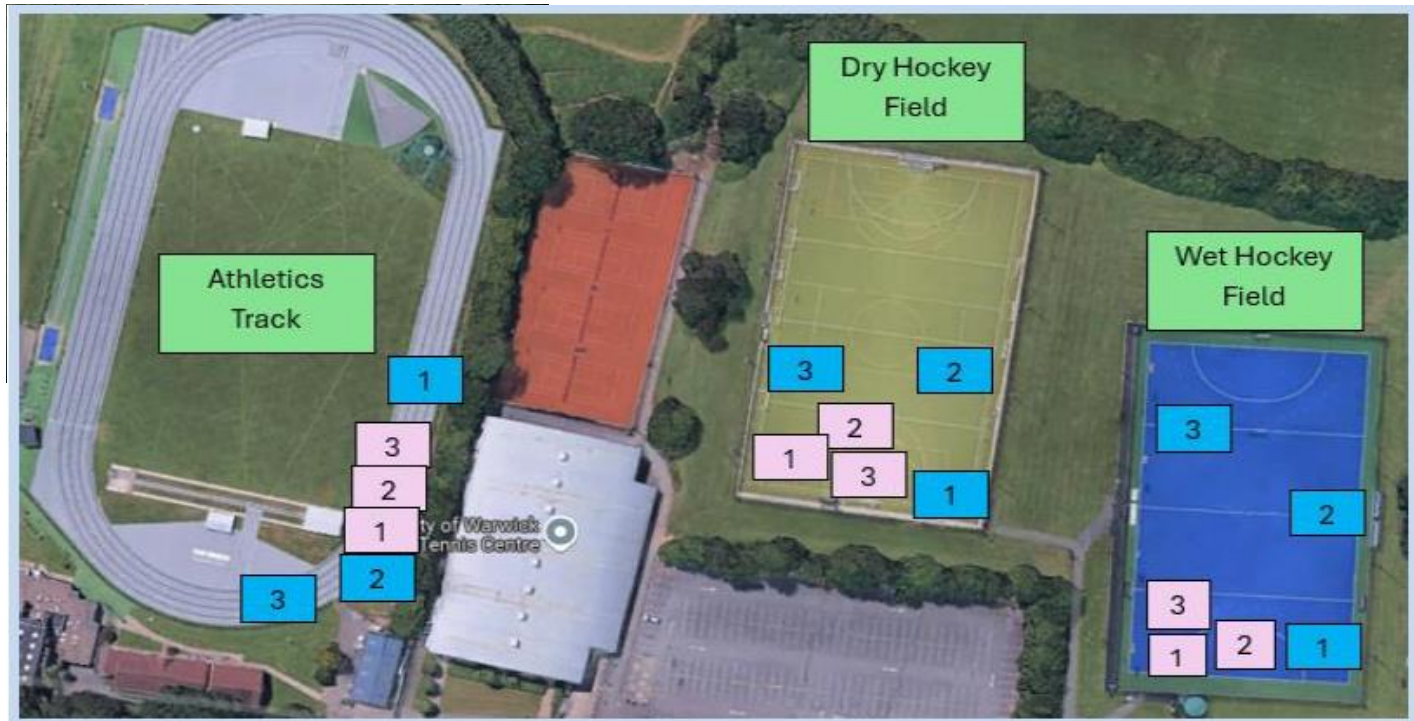
Athletics Track		Units	Test Positions				
Surface Hygiene Swab Test	Untreated Surface	RLU (Relative Light Units)	1	2	3	Average	
			15199	3945	727	6624	
	Treated Surface	RLU (Relative Light Units)	1	2	3	Average	% Change
			519	459	424	467	-93



3G Pitch		Units	Test Positions				
Surface Hygiene Swab Test	Untreated Surface	RLU (Relative Light Units)	1	2	3	Average	
			552	290	264	369	
	Treated Surface	RLU (Relative Light Units)	1	2	3	Average	% Change
			71	26	39	45	-88

Very Clean	< 100
Clean	100 - 250
Attention Needed / Equivocal	250 – 500
Dirty	> 500

Swab test results are reported in Relative Light Units (RLU), a luminescence-based metric used to assess surface cleanliness by detecting ATP levels. Higher RLU values generally indicate higher levels of contamination.

APPENDIX 1 | SITE LOCATION PLAN



-  Treated areas
-  Untreated areas



APPENDIX 2 | ATP – RLU REFERENCES

ATP (Adenosine Triphosphate)

- ATP is a chemical compound used by all living organisms to power metabolic processes such as muscle function or reproduction.
- ATP is found in living organisms (including bacteria and other microorganisms), as well as in once-living matter (such as food).
- The detection of ATP on a surface is an indicator of the presence of either microbial contamination or food residues that potentially support microbial growth.

Classification of ATP results on sport pitches

- Since sports facilities are located outdoors and are therefore part of the natural environment, they are exposed to constantly changing weather conditions, but also to the natural distribution of micro-organisms. Added to this are the bodily fluids (sweat, blood) of the athletes who use these facilities.
- Based on many years of observations, in which surfaces in the food industry were analysed both visually for contamination and microbiological contact tests and ATP measurements were carried out, areas with an ATP value of <100 RLU are considered clean, those in the range of 100 – 500 RLU are still acceptable during operation. Areas with ATP values >500 RLU are considered relatively contaminated.
- [atp-testing---a-proven-method-to-measure-cleanliness.pdf](#)
- <https://smartcommonsense.com/testing/>
- American national library of medicine. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10426997/>

Table 1. Cleanliness classifications based on Relative Light Unit (RLU) measurements from paired samples.

Cleanliness classification	RLU levels on measurement	Action
Very clean	Both < 100 RLU	
Clean	Both < 250 RLU	
Equivocal	One < 250 RLU + One > 250 RLU	Re-cleaning according to the 3 rd or 4 th sampling result*.
Dirty/Fail	Both > 250 RLU	Re-cleaning*.

[Open in a new tab](#)

*According to Witeley et al. [16]

END OF REPORT



 CLIENT FEEDBACK



 SCAN ME FOR WEBSITE



TESTING TECHNOLOGY FOR SPORT



+44(0)1506 444 755



info@sportslabs.co.uk
www.sportslabs.co.uk



1 Adam Square, Brucefield Industry Park,
Livingston, EH54 9DE, West Lothian, Scotland, UK