

## Titan PW Elite M 7mm:

### Oppbygning:

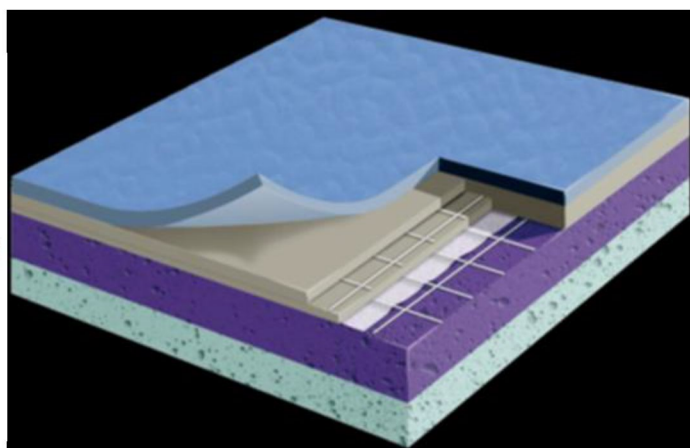
- 0.2mm fuktsperre med 50cm overlapp.
- 15mm dempingsmateriale i skum.
- 15mm kryssfiner moduler som limes og legges i forbandt.
- Mondo Vinylspor m 7.0 mm punktelastisk PVC sportsmatte som hellimes til undergulvet.

**Byggehøyde:** ca. 37mm

**Illustrasjon:** Titan PW Elite 30.



**Punkt elastisk topp av PVC 7mm:**



Gulvet tilfredsstillter KUD's krav til kombielastisk sportsgulv for tildeling av spillemidler

Betongkrav kl A: +/- 2mm på 2m rettholt.

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TESTING TECHNOLOGY FOR SPORT

# Laboratory Analysis Report

BS EN 14904: 2006

Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use

Vinylsport M 7,5 mm

Report Number: 10983/0486

Report Status: Draft

Client: Mondo S.p.A.

Piazzale E. Stroppiana (Fraz.Gallo),1

10251, Alba, Cuneo, Italia



## HEADQUARTERS

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## REGIONAL LOCATIONS

- USA
- Morocco
- Turkey
- South Africa
- Netherlands
- Belgium
- Norway
- Israel

## 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.

\* Not all tests carried out are within our scope of ISO 17025 accreditation.

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

## Declaration of Conformity

We confirm that the tests described in this report have been carried out in accordance with BS EN 14904: 2006 Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use, and this report accurately reflects the outcome of the tests conducted.

<b>Report Written By:</b>	Craig Melrose	<b>Report Checked By:</b>	Sean Ramsay
<b>Date:</b>	08/02/2021	<b>Date:</b>	08/02/2021
<b>Signed:</b>		<b>Signed:</b>	

## Test Laboratory

<b>Test Laboratory Name:</b>	Sports Labs Ltd
<b>Address:</b>	1 Adam Square, Brucefield Industry Park
<b>City &amp; Postal (ZIP) Code:</b>	Livingston, EH54 9DE
<b>State or Province:</b>	West Lothian
<b>Country:</b>	Scotland, UK
<b>Telephone:</b>	+44(0)1506 444 755
<b>Email:</b>	info@sportslabs.co.uk

## Client

<b>Client's Name:</b>	Mondo S.p.A.
<b>Address:</b>	Piazzale E. Stroppiana (Fraz.Gallo), 1
<b>City &amp; Postal (ZIP) Code:</b>	12051, Alba
<b>State or Province:</b>	Cuneo
<b>Country:</b>	Italia
<b>Telephone:</b>	+39 0173 23 21 11
<b>Email:</b>	info@mondo-sport.com

Product Description			
Product Name:	Vinylsport M 7,5 mm		
Manufacturer:	Mondo S.p.A.		
Product Type:	Point-elastic Sports Floor		
Nominal Thickness:	7,5 mm		
Detailed Product Description:	To be confirmed		
Substrate:	Concrete		
Surface Profile Image [Plan View]:		Surface Profile Image [End Elevation]:	
			
Sample Reference			
Laboratory Job No.	10983		Date Received
Sample Reference No.	Surface Sample 1	0486	12/01/2021
	Surface Sample 2, if applicable	-	-
	Surface Sample 3, if applicable	-	-
<p>Test Laboratories are required to store a reference sample of the tested product for a defined period. By checking the box opposite, we confirm that a 200x200mm sample has been placed in storage and will be retained as necessary.</p>		<input checked="" type="checkbox"/> A sample of the tested product has been placed in storage and shall be retained as necessary.	



Performance Results Summary				
Property	Test Method	Mean Result	Requirement	Pass/ Fail
Ball Rebound	EN 12235: 2013	99 %	≥ 90% of rebound on concrete	PASS
Shock Absorption	EN 14808: 2005	32 %	25 % - 75 %	PASS
		Point Elastic P1 ≥25% - <35%		
Vertical Deformation	EN 14809: 2005	0.6 mm	≤ 5.0 mm	PASS
		Point Elastic P1 ≤ 2.0 mm		
Friction	EN 13036-4: 2011	101 PTV	80 – 110 PTV	PASS
Resistance to Indentation	EN 1516: 1999 *	0.4 mm	≤ 0.5 mm after 24 hours	PASS
Resistance to Impact	EN 1517: 2020 *	0.0 mm	< 0.5 mm indentation	PASS
Resistance to Wear	EN ISO 5470-1: 1999 *	98 mg	Synthetic Surfaces ≤ 1000 mg per 1000 cycles	PASS
Resistance to Rolling Load	EN 1569: 2020 *	0.4 mm	≤ 0.5 mm No Damage	PASS
Specular Gloss	EN ISO 2813: 2000 *	15 %	Matt Surfaces ≤ 30 %	PASS

(\* note: these tests are outwith our scope of ISO 17025 Accreditation)

**Ball Rebound - Overview**

A basketball is released from a height of 1.80m and its rebound from the surface is calculated in accordance with EN 12235 and expressed as a percentage relative to that of a rebound on a concrete substrate. A minimum of four tests plus one test for every 500m<sup>2</sup> of area is conducted across the sample.

**Ball Rebound – Requirements**

<b>Test Method</b>	<b>EN12235: 2013</b>
<b>Requirement</b>	≥ 90 % of rebound on concrete
<b>Uniformity</b>	No individual result shall differ from the mean by more than ± 3 units

**Ball Rebound – Test Equipment**

<b>SL Equipment Number</b>	SL113, SL198, SL282, SL481
<b>Uncertainty Value</b>	(k=2.52) ± 2.21 %

**Ball Rebound – Results**

<b>Test Date:</b>	18/01/2021									
<b>Technician:</b>	JH									
<b>Air Temperature:</b>	23.7									
<b>Surface Temperature:</b>	22.3									
<b>Humidity:</b>	49									
<b>Test Condition</b>	DRY – as supplied									
<b>Concrete Value</b>	1.07 m									
<b>RESULTS</b>	<b>Test 1</b>		<b>Test 2</b>		<b>Test 3</b>		<b>Test 4</b>		<b>Test 5</b>	
	<b>m</b>	<b>%</b>	<b>m</b>	<b>%</b>	<b>m</b>	<b>%</b>	<b>m</b>	<b>%</b>	<b>m</b>	<b>%</b>
<b>Drop 1</b>	1.03	96	1.05	98	1.06	99	1.08	101	1.05	98
<b>Drop 2</b>	1.03	96	1.05	98	1.04	97	1.05	98	1.07	100
<b>Drop 3</b>	1.07	100	1.05	98	1.06	99	1.05	98	1.05	98
<b>Drop 4</b>	1.07	100	1.04	97	1.07	100	1.07	100	1.07	100
<b>Drop 5</b>	1.07	100	1.04	97	1.05	98	1.07	100	1.08	101
<b>Test Mean Result</b>		<b>99 %</b>		<b>98 %</b>		<b>99 %</b>		<b>100 %</b>		<b>100 %</b>
<b>Overall Mean Result</b>	<b>99 %</b>									
<b>Requirement</b>	≥ 90 % (individual results ≤± 3 units from mean)									
<b>Pass/Fail</b>	<b>PASS</b>									

**Shock Absorption - Overview**

A mass is allowed to fall onto a spring placed on the test sample and the maximum force applied is recorded. The difference between this value and the maximum force measured on a concrete substrate is reported as the force reduction or shock absorption value. The drop is conducted 3 times on the same location, and the mean values of the second and third drops is determined as the force reduction value. A minimum of four tests plus one test for every 500m<sup>2</sup> of area is conducted across the sample.

**Shock Absorption – Requirements**

<b>Test Method</b>	<b>EN14808: 2005</b>
<b>Requirement</b>	25 % - 75 % (individual results $\leq \pm 5$ units from mean)
<b>Uniformity</b>	No individual result shall differ from the mean by more than $\pm 5$ units

**Shock Absorption – Test Equipment**

<b>SL Equipment Number</b>	SL121, SL281, SL053
<b>Uncertainty Value</b>	(k=2.24) $\pm 2.13$ %

**Shock Absorption – Results**

<b>Test Date:</b>	18/01/2021				
<b>Technician:</b>	JH				
<b>Air Temperature:</b>	23.6				
<b>Surface Temperature:</b>	22.3				
<b>Humidity:</b>	49				
<b>Test Condition</b>	<b>DRY – as supplied</b>				
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Test 4</b>	<b>Test 5</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
<b>Drop 1</b>	31.8	31.9	33.8	31.2	31.8
<b>Drop 2</b>	30.8	30.4	33.2	31.7	29.8
<b>Drop 3</b>	32.2	32.2	33.6	32.2	30.1
<b>Test Mean Result (of 2<sup>nd</sup> and 3<sup>rd</sup> drop)</b>	<b>31.5</b>	<b>31.3</b>	<b>33.4</b>	<b>32.0</b>	<b>30.0</b>
<b>Overall Mean Result</b>	<b>31.6 %</b>				
<b>Classification</b>	<b>Point Elastic P1 <math>\geq 25\%</math> - <math>&lt; 35\%</math></b>				
<b>Pass/Fail</b>	<b>PASS</b>				

**Vertical Deformation - Overview**

A mass is allowed to fall onto a spring placed on the test sample and the maximum deformation is recorded. The test is conducted 3 times on the same location, and the mean values of the second and third drops is determined as the vertical deformation value. A minimum of four tests plus one test for every 500m<sup>2</sup> of area is conducted across the sample.

**Vertical Deformation – Requirements**

<b>Test Method</b>	<b>EN14809: 2005</b>
<b>Requirement</b>	≤ 5.0 mm

**Vertical Deformation – Test Equipment**

<b>SL Equipment Number</b>	SL121, SL118, SL053, SL107, SL108
<b>Uncertainty Value</b>	(k=2.00) ± 0.83 mm

**Vertical Deformation – Results**

<b>Test Date:</b>	18/01/2021				
<b>Technician:</b>	JH				
<b>Air Temperature:</b>	23.7				
<b>Surface Temperature:</b>	22.3				
<b>Humidity:</b>	49				
<b>Test Condition</b>	DRY – as supplied				
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Test 4</b>	<b>Test 5</b>
	mm	mm	mm	mm	mm
<b>Drop 1</b>	0.6	0.6	0.8	0.8	0.8
<b>Drop 2</b>	0.6	0.5	0.7	0.8	0.6
<b>Drop 3</b>	0.5	0.5	0.6	0.7	0.7
<b>Test Mean Result (of 2<sup>nd</sup> and 3<sup>rd</sup> drop)</b>	<b>0.5</b>	<b>0.5</b>	<b>0.7</b>	<b>0.8</b>	<b>0.7</b>
<b>Overall Mean Result</b>	<b>0.6 mm</b>				
<b>Classification</b>	<b>Point Elastic P1 ≤ 2.0 mm</b>				
<b>Pass/Fail</b>	<b>PASS</b>				



**Friction - Overview**

The Pendulum Tester incorporates a spring-loaded slider made of a standard rubber mounted to the end of a pendulum arm. Upon releasing the pendulum arm from a horizontal position, the loss of energy as the slider assembly passes over the test surface is measured by the reduction in length of the upswing using a calibrated scale.

**Friction – Requirements**

<b>Test Method</b>	<b>EN 13036-4: 2011</b>
<b>Requirement</b>	80 – 110 PTV
<b>Uniformity</b>	No individual result shall differ from the mean by more than $\pm 4$ units. Swings 3 – 5 must remain constant.
<b>Friction – Test Equipment</b>	
<b>SL Equipment Number</b>	SL005, SL092, SL394, SL302, SL490, SL395
<b>Uncertainty Value</b>	(k=2.04) $\pm$ 3.22 PTV

**Friction – Results**

<b>Test Date:</b>	19/01/2021		
<b>Technician:</b>	JH		
<b>Air Temperature:</b>	23.6		
<b>Surface Temperature:</b>	22.2		
<b>Humidity:</b>	47		
<b>Test Condition</b>	<b>DRY – as supplied</b>		
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>
<b>Swing 1</b>	99	99	99
<b>Swing 2</b>	101	101	101
<b>Swing 3</b>	102	102	102
<b>Swing 4</b>	102	102	102
<b>Swing 5</b>	102	102	102
<b>Test Mean Result</b>	<b>101</b>	<b>101</b>	<b>101</b>
<b>Overall Mean Result</b>	<b>101 PTV</b>		
<b>Requirement</b>	80 – 110 PTV		
<b>Pass/Fail</b>	<b>PASS</b>		

**Resistance to Indentation - Overview**

The resistance to indentation of the surface is determined by measuring the depth of penetration of an indenter under a specified load and by measuring the recovery of the surface over time. The mean residual indentation of the surface after a recovery period of 24 hours is given as the Resistance to Indentation result.

**Resistance to Indentation – Requirements**

<b>Test Method</b>	<b>EN 1516: 1999 *</b>
<b>Requirement</b>	≤ 0.5 mm after 24 hours recovery

**Resistance to Indentation – Test Equipment**

<b>SL Equipment Number</b>	SL Steel Indenter & Loading Rig
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**Resistance to Indentation – Results**

<b>Test Date:</b>	27/01/2021		
<b>Technician:</b>	JH		
<b>Air Temperature:</b>	23.8		
<b>Surface Temperature:</b>	22.8		
<b>Humidity:</b>	41		
<b>Test Condition</b>	<b>DRY – as supplied</b>		
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>
<b>After 5 min recovery</b>	0.7	0.7	0.7
<b>After 24 h recovery</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>
<b>Overall Mean Result</b>	<b>0.4 mm</b>		
<b>Requirement</b>	≤ 0.5 mm after 24 hours recovery		
<b>Pass/Fail</b>	<b>PASS</b>		

(\* note: this test is outwith our scope of ISO 17025 Accreditation)

**Resistance to Impact - Overview**

After conditioning the sample at 50°C for 14 days, a weighted indenter is dropped from a height of 1.0m onto the surface and the area of impact is examined for damage over a 24 hour period. Any cracking, splitting, delamination or permanent indentation of the sample is noted.

**Resistance to Impact – Requirements**

<b>Test Method</b>	<b>EN 1517: 2020 *</b>
<b>Requirement</b>	No perceivable cracking, splitting, delamination or permanent indentation, except that for wooden sports floors the indentation shall not exceed 0.5 mm
<b>Resistance to Impact – Test Equipment</b>	
<b>SL Equipment Number</b>	SL879

**Resistance to Impact – Results**

<b>Test Date:</b>	02/02/2021
<b>Technician:</b>	JH
<b>Air Temperature:</b>	23.7
<b>Surface Temperature:</b>	22.8
<b>Humidity:</b>	43
<b>Test Condition</b>	<b>After conditioning at 50°C for 14 days</b>
<b>RESULTS</b>	<b>Test 1</b>
<b>Visual Assessment</b>	<b>No perceivable cracking, splitting, delamination or permanent indentation noted</b>
<b>Indentation (if applicable)</b>	<b>0.0 mm</b>
<b>Requirement</b>	No perceivable cracking, splitting, delamination or permanent indentation, except that for wooden sports floors the indentation shall not exceed 0.5 mm
<b>Pass/Fail</b>	<b>PASS</b>

(\* note: this test is outwith our scope of ISO 17025 Accreditation)

**Resistance to Wear - Overview**

Six samples are tested for resistance to wear using taber abrasion apparatus fitted with specific abrasive wheels. The mass of the unworn sample is measured and then it is exposed to 1000 cycles of wear on the taber abrader, after which the mass is then re-measured, and any mass loss determined.

**Resistance to Wear – Requirements**

<b>Test Method</b>	<b>EN ISO 5470-1: 1999 *</b>
<b>Requirement</b>	Coatings & Lacquers $\leq$ 80 mg per 1000 cycles

**Resistance to Wear – Test Equipment**

<b>SL Equipment Number</b>	SL Taber Abrader
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**Resistance to Wear – Results**

<b>Test Date:</b>	02/02/2021					
<b>Technician:</b>	JH					
<b>Air Temperature:</b>	23.6					
<b>Surface Temperature:</b>	22.9					
<b>Humidity:</b>	42					
<b>Test Condition</b>	<b>DRY – as supplied</b>					
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Test 4</b>	<b>Test 5</b>	<b>Test 6</b>
<b>Pre-Abrasion Mass (g)</b>	46.3506	46.3577	46.3344	46.4680	46.4619	45.9293
<b>Post-Abrasion Mass (g)</b>	46.2656	46.2635	46.2315	46.3626	46.3618	45.8263
<b>Mass Loss (mg)</b>	<b>85.0</b>	<b>94.2</b>	<b>102.9</b>	<b>105.4</b>	<b>100.1</b>	<b>103.0</b>
<b>Overall Mean Result</b>	<b>98 mg</b>					
<b>Requirement</b>	Synthetic Surfaces $\leq$ 1000 mg per 1000 cycles					
<b>Pass/Fail</b>	<b>PASS</b>					

(\* note: this test is outwith our scope of ISO 17025 Accreditation)



**Resistance to Rolling Load - Overview**

The behaviour of the surface under a rolling load is determined by applying a stress through repeated traversing of a loaded wheel and observing any damage. The apparatus is rolled forwards and back 300 times over the test sample at a speed of 1 m/s. The test area is visually assessed, and any indentation is measured after a recovery time of 15-20 minutes.

**Resistance to Rolling Load – Requirements**

<b>Test Method</b>	<b>EN 1569: 2020 *</b>
<b>Requirement</b>	≤ 0.5 mm No Damage

**Resistance to Rolling Load – Test Equipment**

<b>SL Equipment Number</b>	SL Rolling Load Apparatus
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**Resistance to Rolling Load – Results**

<b>Test Date:</b>	03/02/2021	
<b>Technician:</b>	JH SD	
<b>Air Temperature:</b>	23.7	
<b>Surface Temperature:</b>	23.1	
<b>Humidity:</b>	40	
<b>Test Condition</b>	DRY – as supplied	
<b>RESULTS</b>	<b>0°</b>	<b>90° (Perpendicular)</b>
<b>Visual Assessment</b>	No perceivable damage noted	No perceivable damage noted
<b>Indentation Measurement</b>	0.4 mm	0.4 mm
<b>Overall Mean Result</b>	0.4 mm	
<b>Requirement</b>	≤ 0.5 mm No Perceivable Damage	
<b>Pass/Fail</b>	PASS	

(\* note: this test is outwith our scope of ISO 17025 Accreditation)

**Specular Gloss - Overview**

The specular gloss of the product is determined using a reflectometer with geometry of 85°. Six readings are taken in different areas or directions on the sample, and a mean result is determined which is given below as the overall mean specular gloss result.

**Specular Gloss – Requirements**

<b>Test Method</b>	<b>EN ISO 2813: 2000 *</b>
<b>Requirement</b>	Lacquered Surfaces ≤ 45 %

**Specular Gloss – Test Equipment**

<b>SL Equipment Number</b>	SL Glossmeter
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**Specular Gloss – Results**

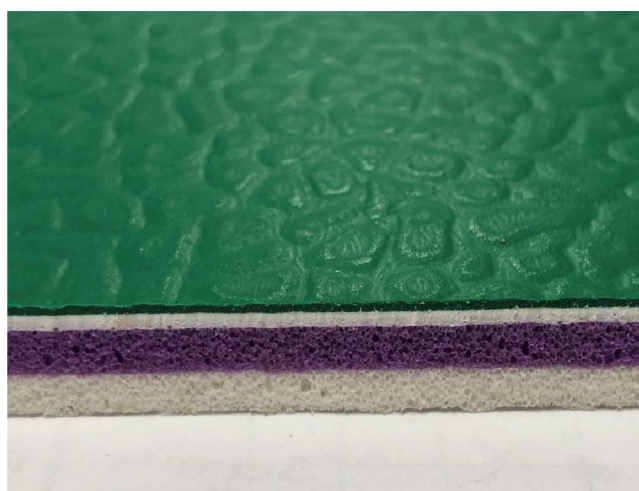
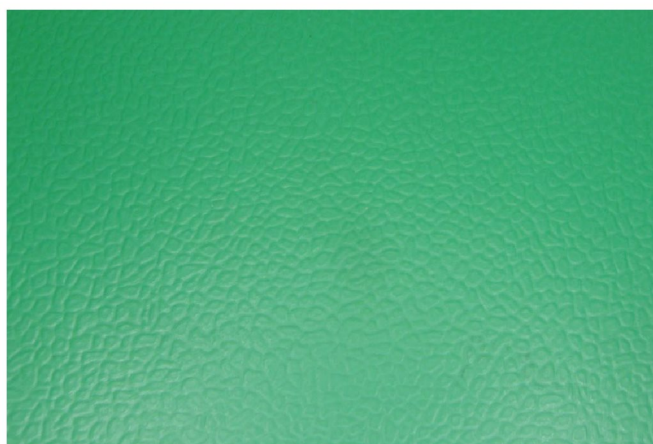
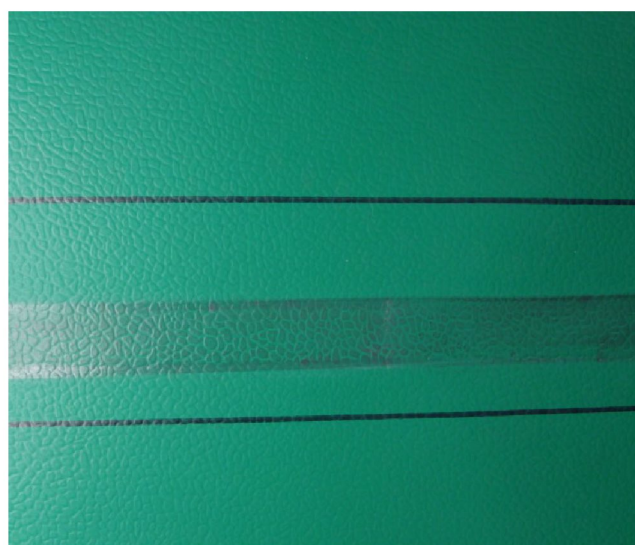
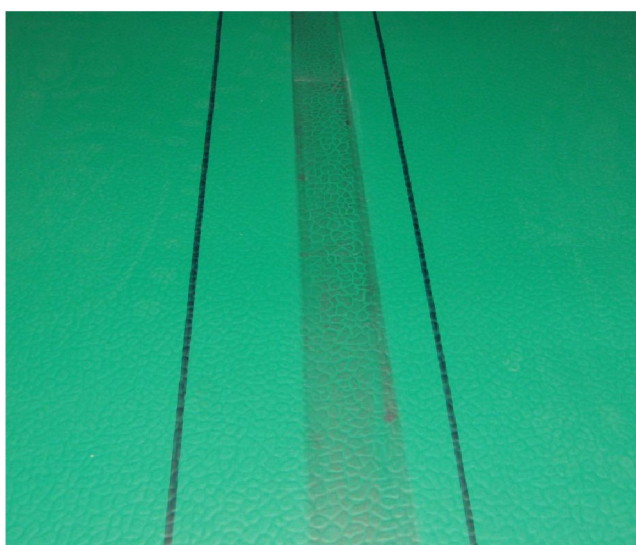
<b>Test Date:</b>	05/02/2021					
<b>Technician:</b>	CM					
<b>Air Temperature:</b>	22.0					
<b>Surface Temperature:</b>	21.8					
<b>Humidity:</b>	45					
<b>Test Condition</b>	<b>DRY – as supplied</b>					
<b>RESULTS</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Test 4</b>	<b>Test 5</b>	<b>Test 6</b>
	13.2	13.4	12.9	15.7	15.5	17.8
<b>Overall Mean Result</b>	<b>15 %</b>					
<b>Requirement</b>	Matt Surfaces ≤ 30 %					
<b>Pass/Fail</b>	<b>PASS</b>					

(\* note: this test is outwith our scope of ISO 17025 Accreditation)

**Conclusion**

The product submitted was tested in accordance with the methods and requirements outlined in EN 14904: 2006. We confirm all information presented within this report is accurate and appropriately reflects the performance of the samples submitted. Based upon the test results we consider the product supplied to have:

- Met all requirements of EN 14904: 2006 the parameters tested
- Failed to meet some requirements of EN 14904: 2006 for the parameters tested

**Sample Pictures****Sample Pictures - After Rolling Load**

**END OF REPORT**



**TESTING TECHNOLOGY FOR SPORT**