

Laboratory Report AS-0303/3

STF Sandwich Track

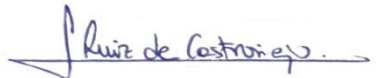
Athletics track surfacing

Summary:

A programme of testing has been carried out on STF Sandwich Track, a synthetic athletics track surfacing from STF International Construction Engineering Limited. The product was tested to the requirements of *ASTM F 2157-09 - "Standard Specification for Synthetic Surfaced Running Tracks"*.

This report describes the method of test employed and details the results obtained.

Reported by:



Susana Ruiz de Castroviejo
Operations Manager

Date of this report:

1st December 2022

*Tests marked * are outside the scope of our accreditation under UKAS*



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1 INTRODUCTION

Instructions were received from Jason Zhang of STF International Construction Engineering Limited to carry out a programme of testing on their sports surfacing *STF Sandwich Track*. The product was tested to the requirements of *ASTM F 2157-09 - "Standard Specification for Synthetic Surfaced Running Tracks"*.

Samples were received from:

STF International Construction Engineering Limited
Room 2103
Tung Chiu Commercial Centre 193
Lockhard Road, Wan Chai
Hong Kong
CHINA

Samples were tested at Centre for Sports Technology facility:

CST
Unit C
Circle Line House
8 East Road
CM20 2BJ
UK

The results obtained relate only to sample provided for test.

Sample was tested in the "as received" condition unless otherwise stated.

2 SAMPLE DETAILS

4 No. identical samples of STF Sandwich Track, measuring 500 x 500mm, were supplied for test. The samples were received on 6th July 2022.

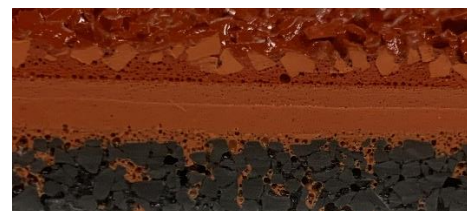
STF Sandwich Track is a sandwich system, non-permeable sports surfacing constructed in three layers with an overall thickness of 15.6mm. After abrasion of 50% of the texture depth, the absolute thickness was 13.9mm.

Construction of each layer was as follows (information supplied by client):

Uppermost layer (3rd) -	Coloured PU material coating with Colored EPDM granule broadcast by manual or spraying by sprayer machine. Additional PU protect layer is optional	3.1mm
Middle layer (2nd) -	Coloured PU material mixed with EPDM powder for sealer coating on rubber layer followed by additional coating with colored PU material with squeegee for level well	1.8mm
Lowest layer (1st) -	Rubber granule bound with PU binder applied in situ by pavement machine	10.7mm



Top surface



Cross-section

Samples were tested at 23°C and 42% RH.

Samples were assembled on a rigid concrete substrate for testing.

3 TEST PROCEDURES

The following tests methods were carried out:

- 3.1 Force Reduction** is determined using the method described in EN 14808:2005. This test measures the degree by which the surface reduces the impact force which occurs when an athlete lands on it. The test was devised to simulate the forces observed when a runner's heel strikes the ground. The apparatus consists of a 20kg mass, which is allowed to fall onto a stiff spring resting on the floor. The force which results from the impact depends on the relative stiffness of the floor to that of the spring. The test is carried out on a concrete floor as well as on the floor under test and the result quoted is the amount by which the force measured on the test floor is lower than the force measured on concrete.
- 3.2 Vertical Deformation** is determined using the method described in EN 14809:2005. In this test, the amount by which the floor deflects under impact load is measured directly. The test is similar in principle to the shock absorption test. However, a softer spring is used and the drop height is adjusted so that the peak force produced falls within a certain range.
- 3.3 Tensile Properties***: The Tensile Strength and Elongation at Break were determined according to the method described in EN 12230:2003 and shall be not less than 0.4MPa and 40% respectively. To assess the environmental resistance of the product under test, the same test carried out on a specimen in the as-received condition is repeated after artificial weathering in accordance with EN 14836:2005.
- 3.4 Absolute Thickness** was determined as described in EN 1969:2000, Method A (destructive test method) where a core of the sample was taken and its thickness measured with a dial gauge before and after abrading the top layer with a grade 60 abrasive paper.
- 3.5 Colour*** is assessed using the Grey scale.
- 3.6 Spike Resistance*** was determined following the method described in EN 14810:2006.
- 3.7 Effects of Ageing***
After exposing the surface to artificial weathering, any effects on the surface are assessed by re-measuring tensile strength and elongation at break.

4 RESULTS

Results of laboratory tests on STF Sandwich Track

Specification Clause	Units	Accuracy¹	Result	ASTM F 2157-09 Requirement
Thickness				
Overall	mm	±0.5	15.6	-
Absolute	mm	±0.1	13.9	
Force Reduction at 23°C	%	± 1	39	35 to 50
Vertical Deformation at 23°C	mm	± 0.1	2.0	0.6 to 2.5
Tensile Properties*				
As received				
Tensile strength	MPa	± 0.01	0.97	≥ 0.5
Elongation at break	%	± 5	189	≥ 40
After weathering				
Tensile strength	MPa	± 0.01	0.89	≥ 0.5
Elongation at break	%	± 5	167	≥ 40
Colour *				
Methuen Atlas reference	-	±1	9D8 Reddish Brown	No requirement
Grey scale			Even colour	
Spike Resistance*	-	-	No damage	No damage

¹ Accuracy refers to the precision of the test.

Temperature	Force Reduction	Vertical Deformation
(° C ±1)	(% ±1)	(mm ±0.1)
10	39	1.9
15	39	2.0
20	39	2.0
23	39	2.0
25	39	2.0
30	40	2.0
35	40	2.1
40	40	2.1

5 CONCLUSIONS

5.1 When tested according to *ASTM F 2157-09 - "Standard Specification for Synthetic Surfaced Running Tracks"* the sample of **STF Sandwich Track** tested conformed to the requirements for Athletics use with regards to its:

- Force Reduction
- Vertical Deformation
- Absolute Thickness
- Tensile Properties *
- Spike Resistance*
- Colour*
- Effects of Ageing*

5.2 Results relate only to the sample provided for test.

END OF TEXT

Appendix 1 - Test Certificate

TEST CERTIFICATE

THIS IS TO CERTIFY THAT THE SAMPLE OF

STF Sandwich Track

Supplied for test by:

STF International Construction Engineering Limited

has been tested in accordance with ASTM F 2157-09 - "Standard Specification for Synthetic Surfaced Running Tracks" and met the following requirements relative to a surface for:

*Force Reduction
Vertical Deformation
Absolute Thickness
Tensile Properties *
Spike Resistance*
Colour*
Effects of Ageing**



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Susana Ruiz de Castroviejo
Operations Manager
Date: 1st December 2022



IMPORTANT: The performance of many sports and recreation surfacing products can be influenced by changes to their thickness, density and other properties and by the manner in which they are installed. The sample was tested in the "as received" condition unless otherwise stated. Reference should always be made to the Laboratory Report relating to this Certificate, to ensure relevance to the intended situation. The Laboratory Report to which this Certificate relates is numbered:

AS-0303/3 dated 1st December 2022

CST is a member of the International Association for Sports Surface Sciences (ISSS) and formally accredited by the World Athletics (WA), the International Tennis Federation (ITF), World Squash Federation (WSF), World Bowls (WB), International Basketball Federation (FIBA) and the Union des associations européennes de football (UEFA) for the testing of products to their specification.