FIFA Quality Programme for Football Turf

FIFA LABORATORY TEST REPORT

Manual 2015

Product name	GreenFields Slide Max Elite 60 165 15.6 s sbr
Product type (Field/Lines)	Field
FIFA Licensee	Greenfields BV.
FIFA accredited Test Institute	Labosport Ltd

Laboratory Test report number	LSUK.17-0476
Date of test	12.07.2017

Football Turf Laboratory Test Report

1 – Introduction / The Process of certification

In order to be certified, football turf fields must reach the performance and quality criteria established to be as close as possible to playing characteristics of natural grass. To this end, each field must undergo four steps as outlined below:

- a thorough composition and resilience test of the product in the laboratory (step 1)
- the installation of the product as declared, applying the outlined procedures (step 2)
- a test of the final installation for the relevant characteristics of the field as a whole system (step 3)
- if successful, certification FIFA QUALITY or FIFA QUALITY PRO field (step 4)

After expiration of the certificate, the field can be retested (step 3/4)

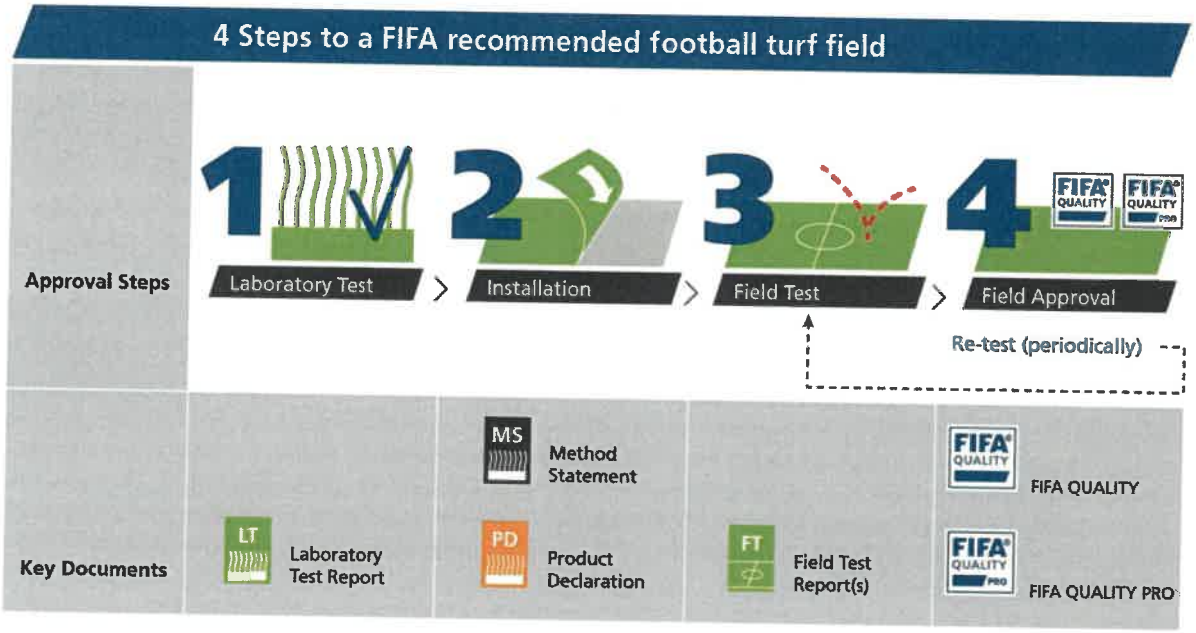

Fig. 1.2 Approval process steps and the related documents / parties

Legend:

LT FT Tests performed by FIFA accredited Test Institutes only

MS PD Originated by the manufacturer (FIFA licensee)

This process is part of the FIFA Quality Programme for Football Turf in order to

- replicate the playing qualities of good quality natural grass,
- create a playing environment that does not increase the risk of injury to players
- achieve adequate durability (providing it is properly maintained)

For more details on *FIFA Quality Programme for Football Turf* see www.fifa.com/quality.

This document covers the complete step 1, FIFA LABORATORY TESTS REPORT. Consider:

- Tests are performed on a representative sample of the manufacturer's sample delivered to the FIFA accredited test institutes
- The test report is only valid if reproduced in its entirety
- The results are only valid for the complete Football Turf (related product) as stated in 2.1
- The related product is eligible for undergoing a field test on a final installation.

IMPORTANT:

To reach FIFA QUALITY PRO (or QUALITY) field certification, as next steps

- the installation has to comply with the related Product Declaration / Method Statement (step 2)
- a successfully passed subsequent FIELD TEST (step 3/4)

This FIFA LABORATORY TEST REPORT may only be used in relationship to Football Turf fields that are going to be submitted for certification under the *FIFA Quality Programme of Football Turf*. Any other use of this report is a violation of the report's copy right which is held by FIFA and breaches the terms of the FIFA Quality Programme of Football Turf licensing agreement.

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2 – Test Object, Participants

2.1 Test Numbers

Report Identification	Laboratory Test report number	LSUK.17-0476
	Test Institute Project number	LSUK.17-0476

2.2 Test Objects

Product Name	GreenFields Slide Max Elite 60 165 15.6 s sbr
Product Identification code	RE1T1460631656003GP
Name of the synthetic turf system	GreenFields Slide Max Elite 60 165 15.6
Performance infill	SBR
Stabilising infill	Sand
Shock-pad or elastic layer (if applicable)	n/a
Sub-base composition	Rigid engineered Base

2.3 Participants, Addresses

Applicant
- FIFA preferred producer
- Licensee

Name	Greenfields BV.			
Address	Greenfields BV.			
Contact	Phone	+31 548 633487	email	grass-support@tencate.com

FIFA accredited Test Institute

Name	Labosport Ltd			
Address	Labosport Ltd, HUCKNALL, NOTTINGHAM			
Contact	Phone	+44 (0) 115 968 1998	email	info@labosport.co.uk

3 – Test Conclusion, Product Approval

The presented Football Turf surface satisfies the FIFA LABORATORY TEST requirements of

FIFA QUALITY	Passed	«passed» or «failed»
FIFA QUALITY PRO	Passed	«passed» or «failed»

IMPORTANT: A successfully passed test of the final installation (FIFA FIELD TEST) is mandatory to obtain FIFA QUALITY / QUALITY PRO Certification!

Report originated by	Name	David Rigby
	Position	Laboratory Manager
	Date	12.07.2017

Report approved by	Name	Colin Young
	Position	Managing Director
	Date	12.07.2017

4 – Product Information / Specifications

4.1 Overview – a typical product composition

The basic structure and composition of artificial turf varies. To reach the goal of defined quality and specific functional performances, a set of the relevant parameters for the products / materials used was defined.
Materials / products typically used are as follows:

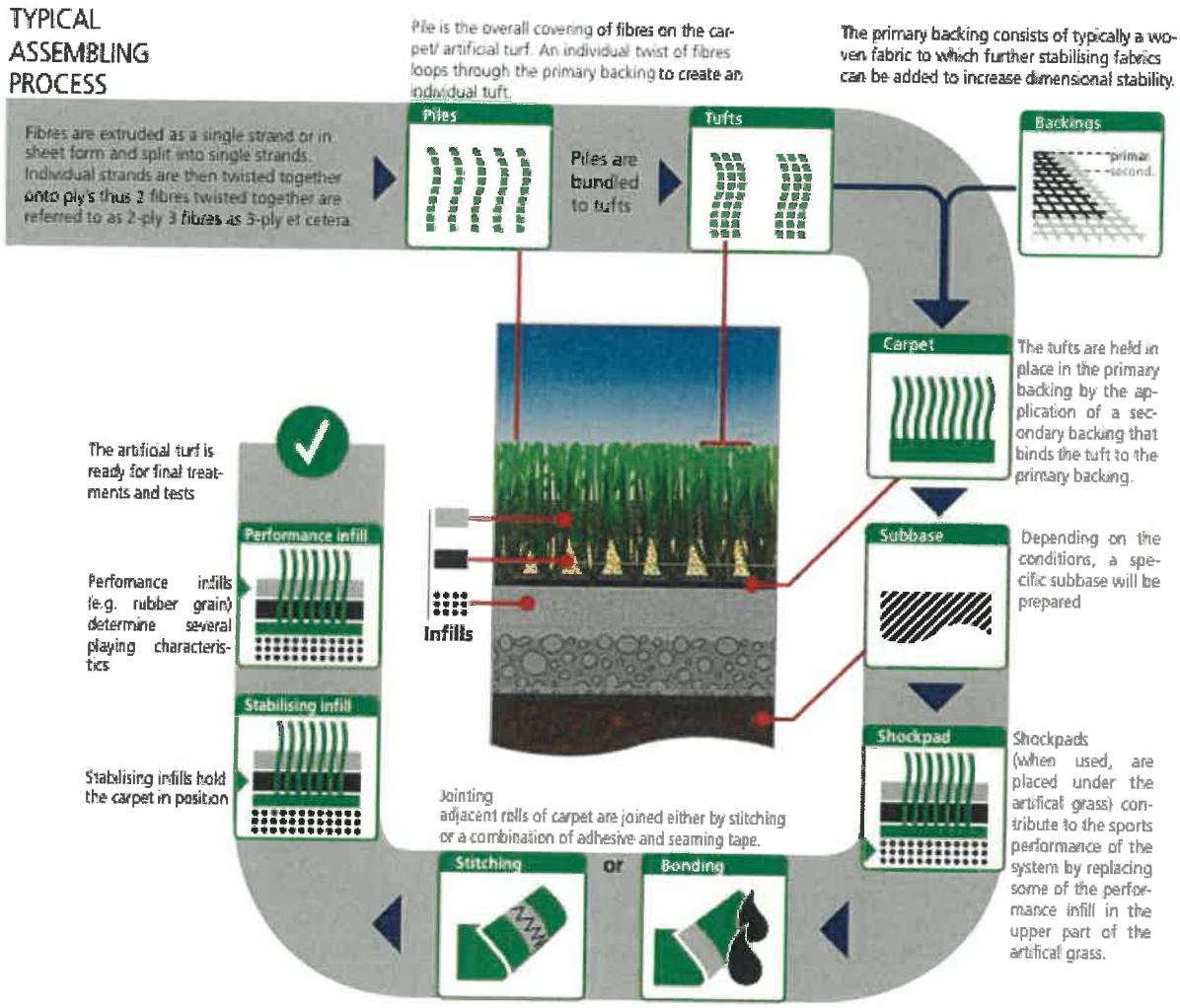

Fig. 1.3 Products / materials used to build up artificial turf

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4 – Product Information / Specifications

4.2 Artificial turf (1/2)

Manufacturer		Belakos BV, Belgotex Pty or Lano NV			
Tuft pattern		Straight			
Pile yarns		Yarn A	Yarn B	Yarn C	Standard Test Method
Yarn Manufacturer		TenCate Grass			
Product name, code		DIA XQ RIB 410 : MS D2 156-6 XWR			
Pile yarn profile		See details below	See details below	See details below	–
Pile thickness [μ m]		Diamond shaped 410			–
Pile colour [RAL]	**1**	6010			–
	2	6025			–
	3				–
Pile width [mm]		1.1			–
No of tufts/m²		10,395			ISO1773
Pile length [mm]		60			ISO 2549
Pile weight [g/m²]		2,195			ISO 8543
Pile yarn characterization		PE monofilament XWR Elite (1T146)			–
Pile yarn dtex		15,600/3/3			–

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4 – Product Information / Specifications

4.2 Artificial turf (2/2)

	**Primary backing**	Product name / code	D16 (Double PP)
		Manufacturer	Ten Cate Thiobac
	Re- enforcement scrim	Product name / code	-
		Manufacturer	-
	**Secondary backing**	Product name / code	Latex
		Manufacturer	Eurocompound
		Dry application rate [g/m²]	1,000
	**Carpet**	Minimum tuft withdrawal force [N]	>30
		Carpet mass per unit area [g/m2]	3,447
	Method of jointing		
	**Bonded joints**	Adhesive brand name	Helmitin KR 149/140
		Adhesive manufacturer	Forbo
		Application rate [g/lm]	300 - 350
		Jointing film brand name	Seaming tape 145
		Jointing film manufacturer	CECO
	**Stitched seams**	Tread brand name/product code	-
		Tread manufacturer	-
		Stitch rate [stitch per lm]	-

4.3 Performance infill

	Specifications	Standard Test Method
Product name / code	SBR	
Manufacturer	Genan GmbH	
Material type	Genan FINE	
Material grading	0.7 - 2.0 mm	
Particle shape	spherical, moderate angular	prEN 14955
Particle size range	0.7 - 2.0 mm	EN 933-Part 1
Bulk density [g/cm³]	0.49	EN 1097-3
Application rate [kg/m²]	19.3	

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4 – Product Information / Specifications

4.4 Stabilising infill

	Specifications	Standard Test Method
Product name / code	Sand	
Manufacturer	Filcom	
Material type	Filter sand	
Material grading	0.4 - 1.0 mm	
Particle shape	Rounded	prEN 14955
Particle size [range]	0.5 - 1.0 mm	EN 933-Part 1
Bulk density [g/cm³]	1.56	EN 1097-3
Application rate [kg/m²]	7.5	

Infill depth	40mm	
Free pile height	20mm	

4.5 Shockpad / elastic layer*

	Specifications	Standard Test Method
Product name / code	n/a	
Manufacturer	-	
Type	-	
Composition**	-	
Bulk density [g/cm³]	-	
Thickness	-	EN 1979
Shock absorption [%]	-	FIFA 4a
Deformation	-	FIFA 5a
Tensile strength [N]	-	
Mass per unit area [kg/m²]	-	

* if part of system supplied
** type, rubber granule grading, binder content, etc

Football Turf Laboratory Test Report

4 – Product Information / Specification

4.6 Maintenance requirements (recommendations)

Equipment / material		Remarks
Tractor Unit		Purpose - the power unit that pulls the maintenance tools over the field
Drag	Brush	A maintenance attachment that re-distributes the infill and brings the fibres into a more upright position
	Mat	A maintenance tool used to re-distribute infill
Ball roll ramp		A testing device used to assess the speed of a football over the surface
Maintenance logbook		Is used to record all the maintenance activities that take place on the Football Turf Surface
Top up infill materials		to top up penalty spot and corner areas
...		For further maintenance requirements, please consult the manufacturer's recommendations for your specific system

FIFA Licensee's comments / hints

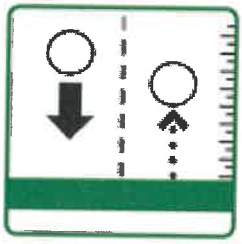
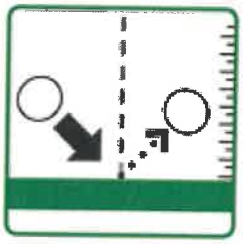
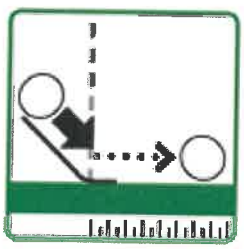
Results after UV ageing are from report 16742/1794 and 16742/1364 issued by Sports Labs Ltd. LABOSPORT does not assume any liability or responsibility to the user or other third party, for the accuracy, completeness or representativeness of this result

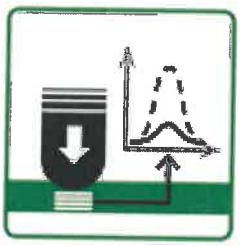
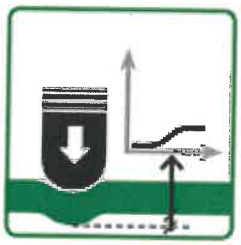
Football Turf Laboratory Test Report

5 – Detailed Laboratory Test Results

5.1 Overview – ball and player to surface interactions

How is the field to play? By means of the following 8 parameters, this question can be answered very well. Furthermore, some values allow conclusions regarding maintenance in order to keep the field in top shape.

Parameter	Comments / hints
1- Vertical ball rebound 	The higher the value the higher the ball will rebound. The ball should not bounce too high or too low. Ball / surface interaction
2- Angled ball rebound 	Angled ball rebound is a combination of the hardness of the field and the resistance from the fibres to the ball and thus a high reading can come from a hard surface, or a low grip surface or a combination of both Ball / surface interaction
3- Ball roll 	The higher the value the faster the ball will run over the surface. The ball should not be too fast or too slow. Ball / surface interaction
4- Rotational resistance 	This simulates the player's ability to alter direction, too high a value and stress can occur across knee ligaments, too low and the player will not be able to grip the surface and may slip causing ligament damage. Player / surface interaction

Parameter	Comments / hints
5- Shock absorption 	Shock absorbency is an indicatic of how hard the field feels to th player. A value that is too lo indicates a hard field and cau: damage to player's joints too so and the surface is energy sappir resulting in increases in fatigu and over-use injuries. Player / surface interaction
6- Deformation 	A surface that deforms too much will result in overstretching of ligaments particularly the around the ankle. Player / surface interaction

Football Turf Laboratory Test Report

5 – Detailed Test Results

5.2 Product identification

	Property		Test result
Artificial Turf	Carpet mass per unit area [g/m²]		3,620
	Tufts per unit area [m²]		10,850
	Pile length above backing [mm]		61.7
	Pile weight [g/m²]		2,348
	Water permeability of carpet [mm/h]		>2,000
	Free pile height		20mm
	Yarn cross section and thickness		See Annex
Performance infill	Particle size range		0.8 - 2.0mm
	Particle shape		Angular A3
	Bulk density [g/cm³]		0.450
	Infill depth		40mm
	Thermographic analysis	% organic	63
		% inorganic	37
Stabilising infill	Particle size range		0.5 - 1.0mm
	Particle shape		Irregular B2
	Bulk density [g/cm³]		1.57
Shockpad / elastic layer (if part of system supplied)	Shock absorption [%]		-
	Deformation		-
	Thickness		-

5.3 Ball / surface interaction

Property		Condition		Test Results	FIFA Approval requirements QUALITY	FIFA Approval requirements PRO	P = passed F = failed QUALITY	P = passed F = failed PRO
Vertical ball rebound	Initial, un-aged	Dry		0.81	0.6 –1m	0.6-0.85 m	Passed	Passed
		Wet		0.78			Passed	Passed
	After simulated wear	3'005 cycles		0.84				Passed
		6'005 cycles		0.89	0.6 – 1m		Passed	
Angled ball rebound	Dry			55	45 – 80%	45 – 80%	Passed	Passed
	Wet			65			Passed	Passed

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	**Reduced Ball roll**	Initial, un-aged	Dry	6.3	4 – 10m	4 – 8m	Passed	Passed
		After simulated wear 3'005 cycles	Dry	6.5				Passed
			Wet	6.8				Passed
		After simulated wear 6'005 cycles	Dry	7.0	4 – 12m		Passed	
			Wet	7.2			Passed	

Remark: All laboratory reports issued prior to 28 April 2017 indicate 3'020 cycles and 6'020 cycles of simulated wear although products were only exposed to 3'005/6'005 cycles.

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5 – Detailed Test Results

5.4 Player / surface interaction

Property		Condition		Test Results	FIFA Approval requirements QUALITY	QUALITY PRO	P = passed F = failed QUAL-ITY	PRO
	**Shock absorption**	Initial, Un-aged	Dry	66.7	57 – 68%	62 – 68%	Passed	Passed
			Wet	66.4			Passed	Passed
		After simulated wear	3'005 cycles	65.6				Passed
			6'005 cycles	65.0	57 – 68%		Passed	Passed
		50°C		66.3		62 – 68%	Passed	Passed
		– 5°C(1)		67.8			Passed	Passed
	**Deformation**	Initial	Dry	10.0	6 – 11mm	6 – 10mm	Passed	Passed
			Wet	10.0			Passed	Passed
		After simulated wear	3'005 cycles	10.0				Passed
			6'005 cycles	9.5	6 – 11mm		Passed	Passed
	**Rotational resistance**	Initial	Dry	38	27–48Nm	32–43Nm	Passed	Passed
			Wet	36			Passed	Passed
		After simulated wear	3'005 cycles	40				Passed
			6'005 cycles	43	27–48Nm		Passed	Passed
	**Skin / surface friction**	Dry		0.64	0.35 – 0.75 μ	0.35 – 0.75 μ	Passed	Passed
	Skin abrasion	Dry		26	± 30 %	± 30 %	Passed	Passed

Remark: All laboratory reports issued prior to 11 April 2017 indicate 3'020 cycles and 6'020 cycles of simulated wear although products were only exposed to 3'005/6'005 cycles.

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5 – Detailed Test Results

5.5 Environmental impact (artificial, light, water)

Property		Aspect		Condition	Test result	FIFA Requirements P= passed F= failed	P/F
	**Pile yarns**	Colour change	1	After artificial weathering	LG 5	≥ Grey scale 3	Passed
			2		DG 4/5		Passed
			3				
		Yarn tensile strength	1		LG -3.0%	Change ≤ 50%	Passed
			2		DG 0.6%		Passed
			3				
	**Polymeric infill**	Colour change			4	≥ Grey scale 3	Passed
		Visual change in composition			No change	No change	Passed
	**Complete system**	Water permeability		N/A	>2,000	>180 mm/h	Passed
	**Stitched joints**	Strength		Un-aged	-	≥ 1000N/100mm	
				Water aged	-		
	**Bonded joints**	Strength		Un-aged	171	≥ 75N/100mm	Passed
				Water aged	155		Passed
	**Carpet tuft**	Withdrawal force		Un-aged	44	≥ 30N	Passed
				Water aged	46		Passed
	Heat	category			3	Information	
	Splash	Splash characteristic			≥1.5	Information	

5.6 Miscellaneous

	**Shockpad Elastic layer**	Tensile strength	Un-aged	-	≥ 0.15 MPa	

5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.1 DSC (Differential Scanning Colorimetry) scans of pile yarn

5.7.2 Performance infill particle grading curve / Stabilising infill particle grading curve

5.7.3 TGA (Thermo Gravimetric Analysis) of performance infill

5.7.4 Composition of unbound sub-base (if tested as part of system) Sub-base particle grading curve

5.7.5 Simulated wear, photos before / after

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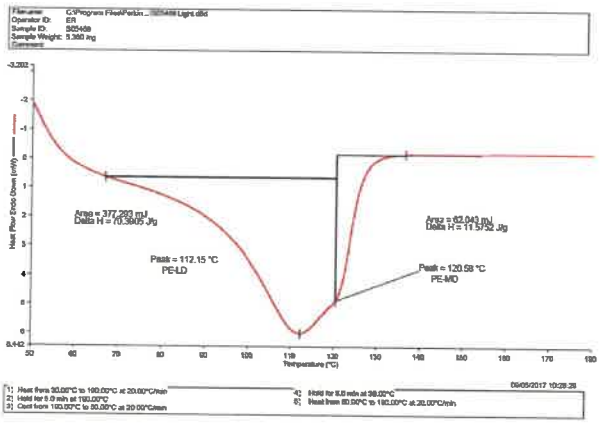
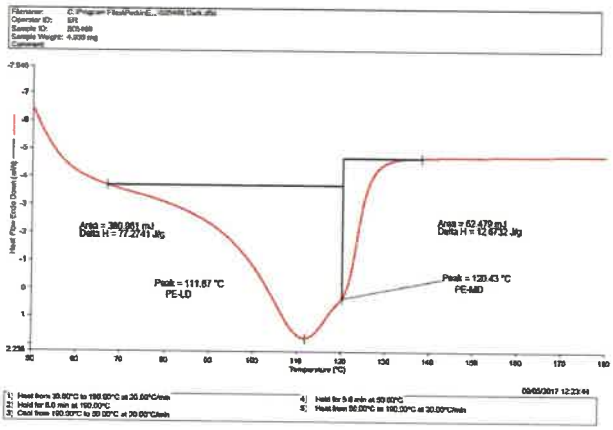
5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.1 DSC Differential Scanning Colorimetry scans of pile yarn



Light yarn



Dark yarn

Comments:

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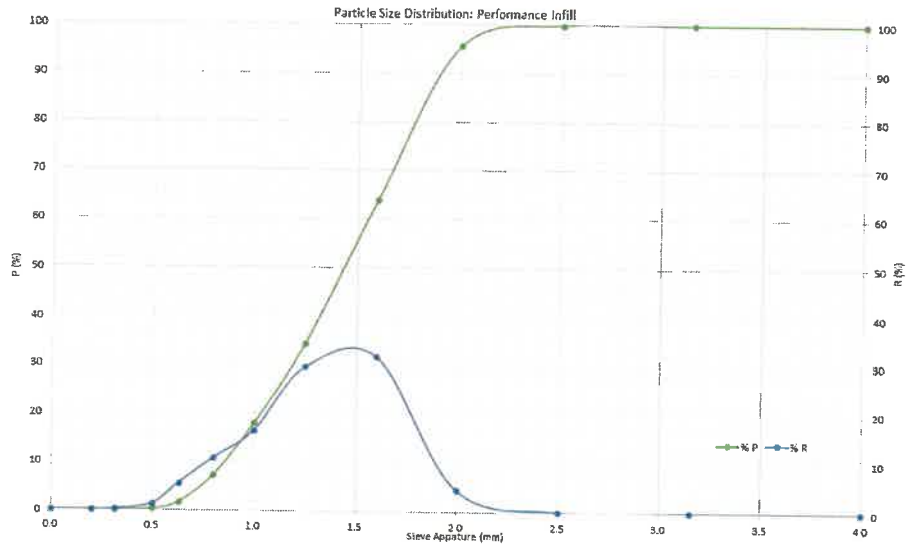
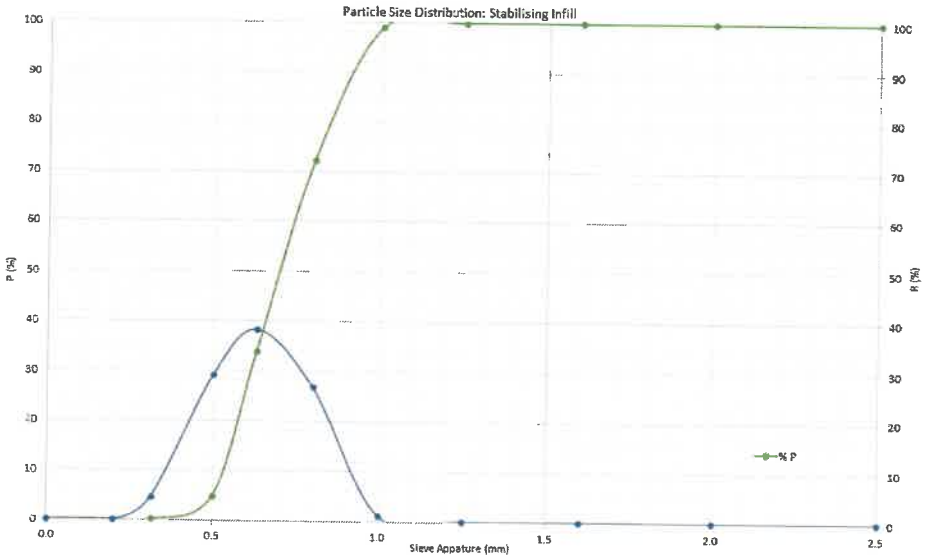
5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.2 a) Performance infill particle grading curve



5.7.2 b) Stabilising infill particle grading curve



Comments:

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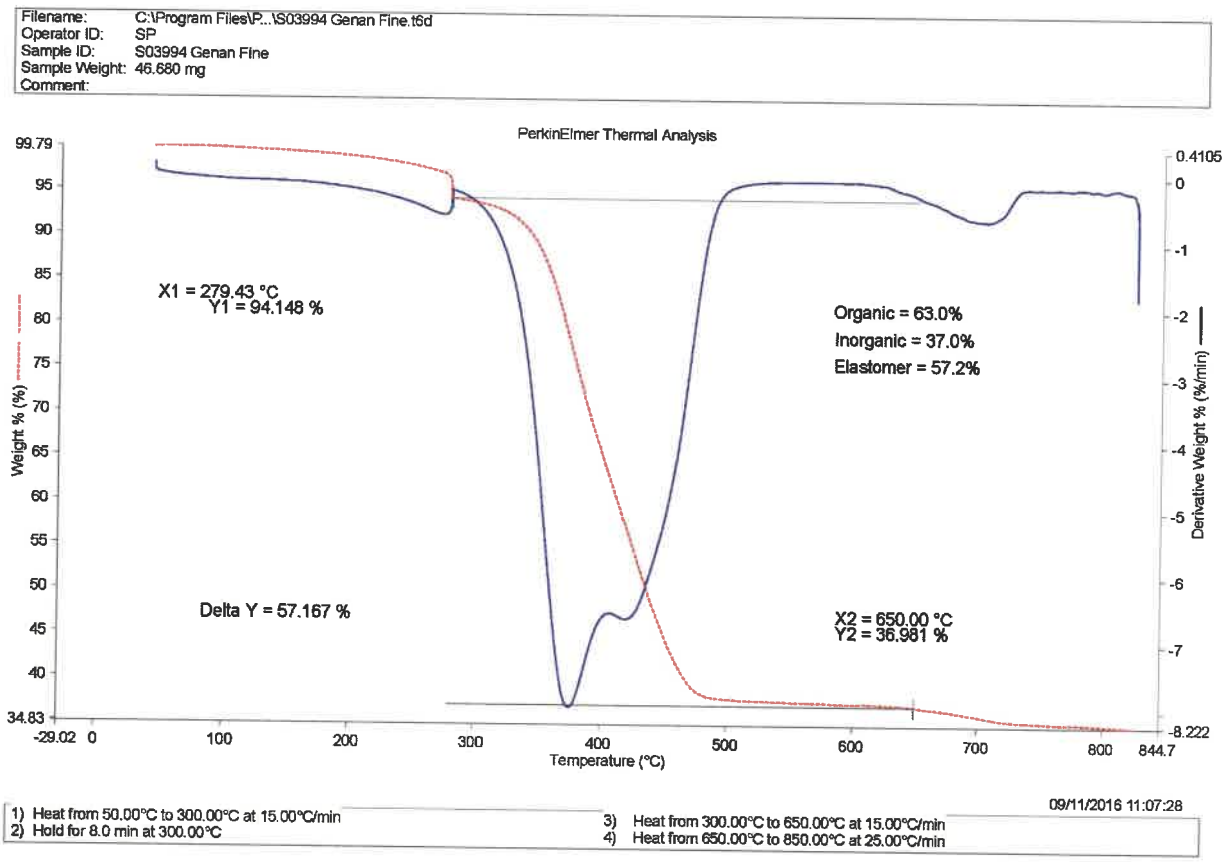
5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.3 TGA of performance infill



Comments:

5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.4 Sub base (if tested as part of system)

Composition	-
Particle size range	-
Particle shape	-
Thickness	-
Compaction & test method	-

Sub-base particle grading curve

Comments:

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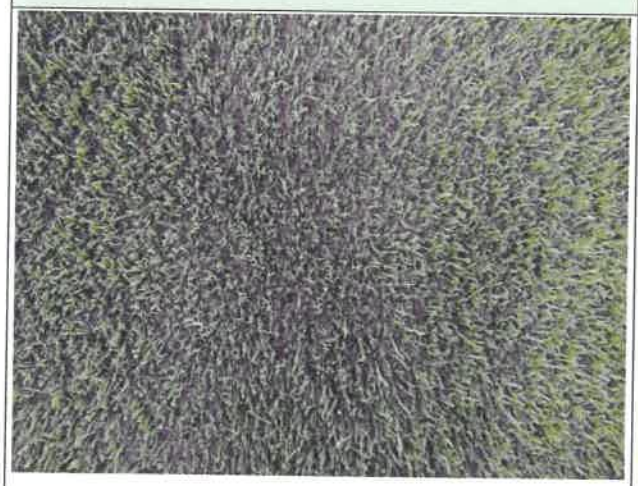
5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.5 Simulated wear (photos before / after wear) Page: 1

Before wear	After wear
	
	

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5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.5 Simulated wear (photos before / after wear) Page: 2

Before wear	After wear
	
	

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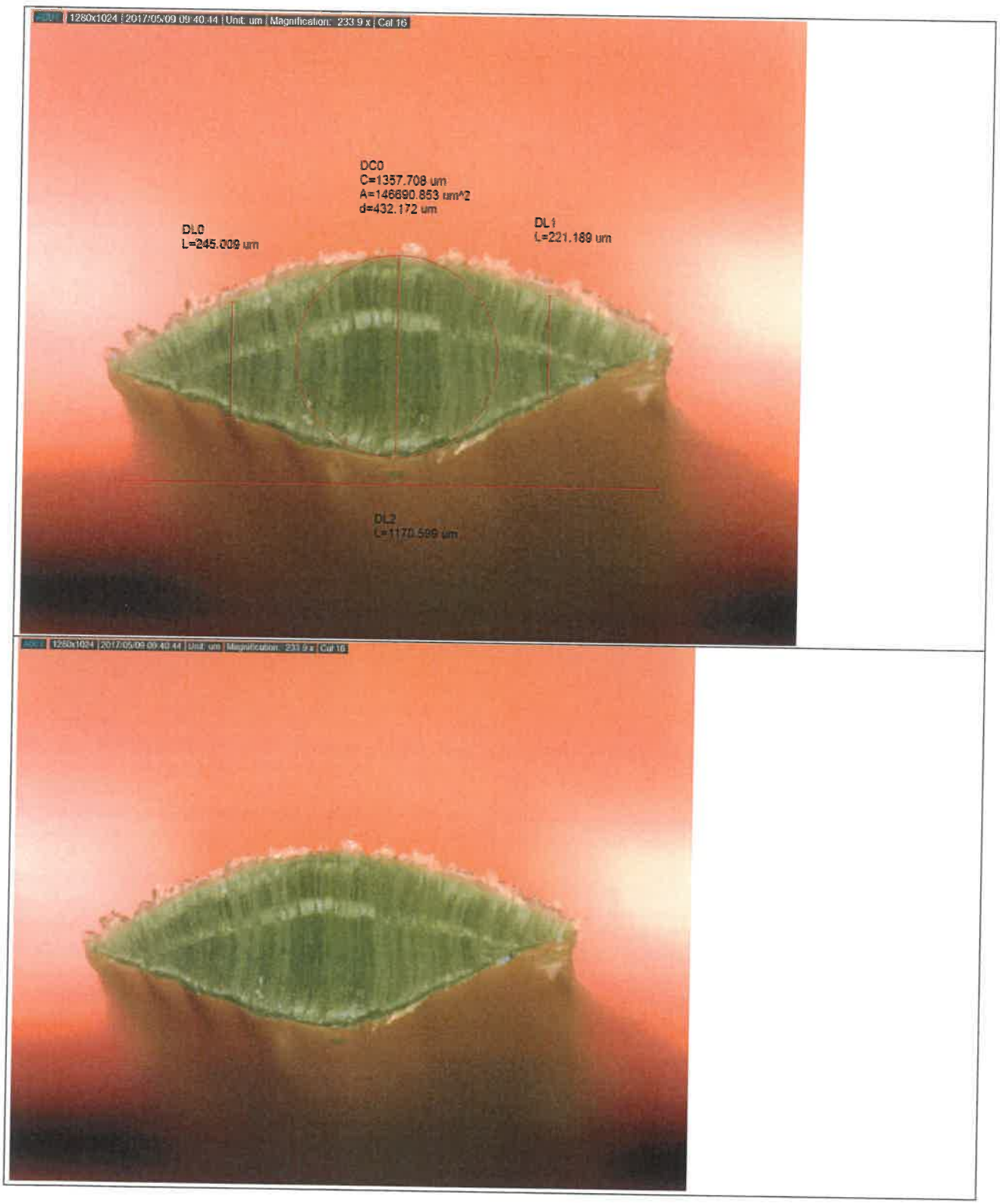
5 – Detailed Test Results

5.7 Explanatory graphs / pictures

5.7.5 Yarn characteristics



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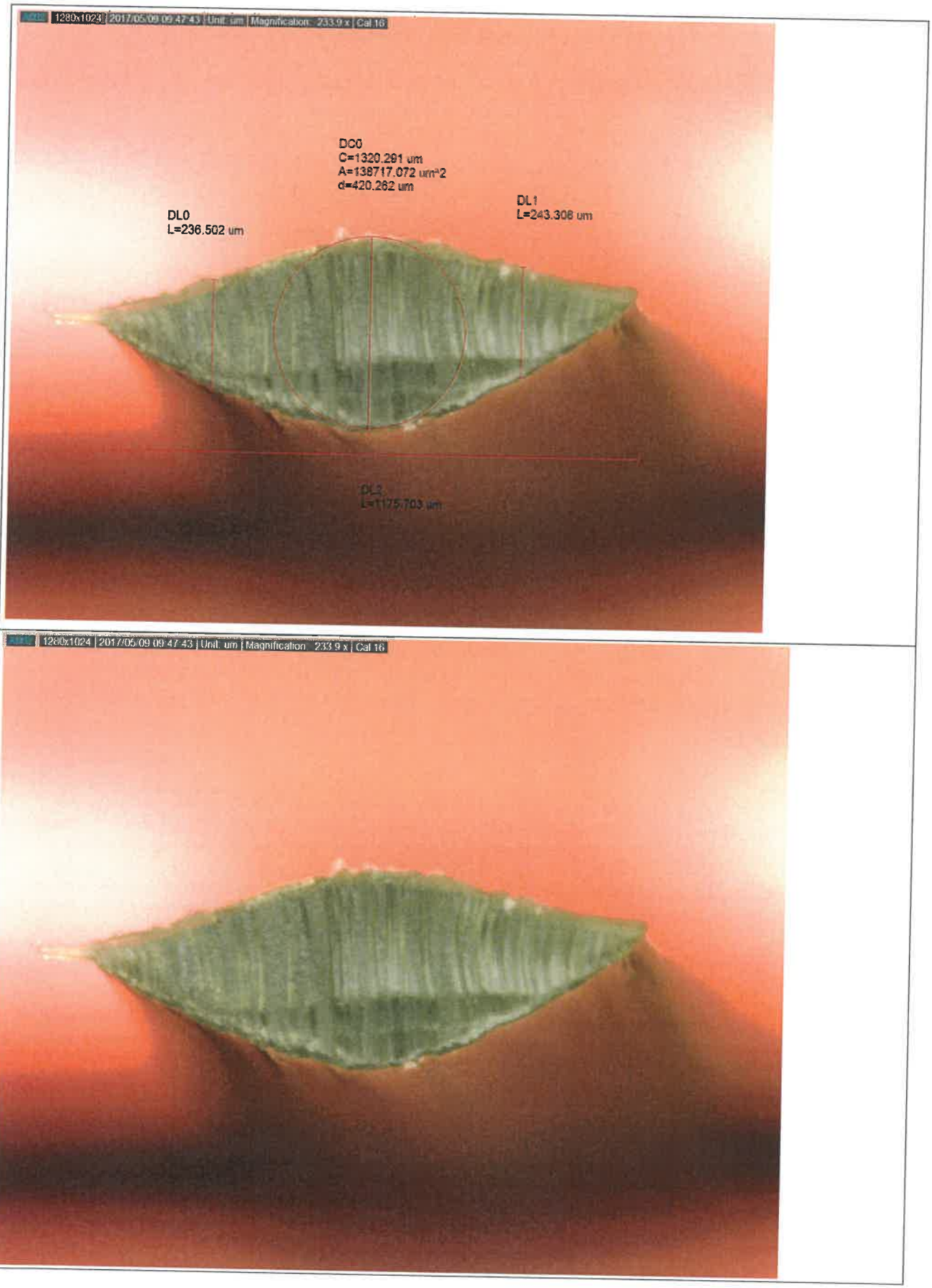

Cross section yarn 3 (including measurements)

Cross section yarn 3 (no measurements)

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Details of dimension measurements

Light yarn thickness 432um; width 1171um / Dark yarn thickness 420um; width 1176um