FREDY SAUL GRIMALDOS MURALLAS
Ingeniero Civil – UIS
CONSTRUCCIÓN – EJECUCIÓN DE OBRAS – CONSULTORIA – INTERVENTORIA – DISEÑO

Bucaramanga, junio 17 de 2025. COMUNICADO FSGM-004-2025

Señores:
ST. NIXON GUILLERMO DURAN SIACHOQUE.
FUERZA AEROESPACIAL COLOMBIANA.
Supervisor.

REFERENCIA: CONTRATO DE OBRA No. 062-00-B-COFAC-BACOF- 2025, OBRA PUBLICA PARA LA CONSERVACIÓN, MANTENIMIENTO PREVENTIVO Y CORRECTIVO DE INFRAESTRUCTURA DE LA BASE AEREA, CR. LUIS ARTURO RODRIGUEZ MENESES-GAORI.

ASUNTO: Entrega de certificación y respaldo técnico de grama sintética

Por medio del presente, me permito hacer entrega de la certificación correspondiente a la grama sintética suministrada, junto con los estudios de laboratorio realizados, en cumplimiento de los requisitos técnicos y de calidad exigidos en el marco del proyecto.

Se adjunta la certificación emitida por la FIFA, en la cual se acredita que la empresa CCGRASS se encuentra debidamente certificada como proveedor autorizado de grama que cumple con los estándares internacionales FIFA Quality y FIFA Quality PRO. Así mismo, se incluye la autorización formal mediante la cual CCGRASS designa a la empresa MAXISOLUCIONES como su proveedor en Colombia.

Estos documentos respaldan la calidad, origen y cumplimiento de los niveles técnicos requeridos para el desarrollo del proyecto, y forman parte integral del compromiso adquirido por nuestra parte.

Agradezco la atención prestada y valiosa colaboración.

Anexos:
1. Certificación de la FIFA a CCGRASS
2. Certificación de CCGRASS a MAXISOLUCIONES
3. Certificación de MAXISOLUCIONES
4. Estudios de laboratorio de la grama sintética

Cordialmente,.



Ing. FREDY SAUL GRIMALDOS MURALLAS
Contratista.

Calle 147 N° 22-63 Altos del Campestre
Celular: 310 76 35 816 email: fredygrimaldos@gmail.com

PREFERRED PROVIDER FOR FOOTBALL TURF

CERTIFICATE

FIFA is pleased to confirm that

CoCreation Grass Co., Ltd

Is classed as a PREFERRED PROVIDER for Football Turf

Valid

from 01/12/2024 to 30/11/2026

Total Quality Service is guaranteed by

- Additional expertise in civil engineering (subbase) and project management (general contractor)
- Full responsibility for the production, installation and maintenance from inception to completion
- High level of service and continuous development of football turf products
- Experience as a FIFA Quality Programme licensee with FIFA-certified fields

Gianni Infantino
Presidente de la Fédération Internationale de Football Association

www.FIFA.com/footballturf

CCGrass The Professional Artficial Grass Manufacturer
CoCreation Grass Corporation

TRUSTED BY The World CCGrass

Bogotá D.C., 16 de junio del 2025

Señores:

Fuerza Aeroespacial de Colombia - FAC

Marandúa, Colombia

CERTIFICACIÓN

Por medio de la presente, **CoCreaction Grass Co. – CCGrass**., declara que **MAXISOLUCIONES DIMAR SAS**, conNit. 900.446.454-1, ha sido designado como nuestro distribuidor autorizado para comercializar y distribuir nuestros productos en Colombia, específicamente la referencia **Pride-5004E140-FIFAPU** producto que ha pasado los niveles de calidad **FIFA Quality & Quality PRO,** la cual fue recomendada al Ingeniero Fredy Grimaldos e instalada en la cancha sintética de la BASE AEREA, CR. LUIS ARTURO RODRIGUEZ MENESES- GAORI.

Esta designación implica que MAXISOLUCIONES DIMAR SAS tiene la responsabilidad de importar, promover, distribuir, vender y ofrecer soporte técnico de nuestros productos, cumpliendo con los estándares de calidad de CCGrass.

La presente certificación se expide el 16 de junio de 2025.

Cualquier inquietud por favor contactar a:

Filipe Fei

Sales Manager

CCGrass

Mob: +86 18061711973 **Tel :** +86 25 6981 1755

Fax: +86 25 69811618 **Email:** filipe_fei@ccgrass.com

Add: Floor 19, Dadi Building, No.56 Huaqiao Road, Nanjing 210029, China

www.ccgrass.com | www.ccgrasslandscape.com

Bogotá D.C., 11 de junio del 2025

Señor:
Fredy Grimaldos
CC 91.290.246
Bogotá D.D.

Ref.: Certificación Grama Sintética FIFA Quality PRO

ASUNTO: Certificación del representante para Colombia o importador de la Grama sintética

MAXISOLUCIONES DIMAR SAS
NIT. 900.446.444-1

CERTIFICA QUE:

Que el señor **FREDY SAUL GRIMALDOS MURALLAS** identificado con cedula de ciudadanía No. 91.290.246 de la ciudad de Bucaramanga adquirió la grama sintética de 50 mm referencia **Pride-5004E140-FIFAPU**, de procedencia de nuestro proveedor mundial **CCGRASS,** el cual cuenta con certificación **FIFA PREFERENCE PRODUCER FOR FOOTBALL TURF**.

La grama suministrada **Pride-5004E140-FIFAPU** ha pasado los niveles de calidad **FIFA Quality & Quality PRO.**

Si requiere información adicional sobre esta oferta o cualquier otro aspecto relacionado, estamos a su disposición para brindarle el mejor asesoramiento.

Será un placer atenderle.

Alejandro Guerrero
GramaSport - Maxisoluciones Dimar SAS
Calle 32 Sur # 26 B – 40
Cel: 3153964198
Mail: comercial@gramasport.com

FIFA LABORATORY TEST REPORT

TM Football Turf I 2015
01.01.2015

Product	CCGrass Pride 50-A2 SP
FIFA Licensee	CoCreation Grass Co., Ltd.
Test Institute	Sports Labs Ltd.

Test Number	128318
External Test Number	13173/8375
Date of Test	11.04.2023
Test Result	Passed
Quality Level	FIFA Quality & Quality PRO
Test Type	Initial

Licensee

Main Address

Name	CoCreation Grass Co., Ltd.
Address	CoCreation Grass Corporation, Ltd. Floor 18th Dadi Building, No. 56, Huaqiao Road
ZIP / City	210029 / NANJING
Website	www.ccgrass.com
Contact Email	
Contact Phone	

Test institute

Main Address

Name	Sports Labs Ltd.
Address	1 Adam Square Brucefield Industrial Park
ZIP / City	EH54 9DE / LIVINGSTON
Website	www.sportslabs.co.uk
Contact Email	info@sportslabs.co.uk
Contact Phone	+44/1506 44 755

Approval

Test Institute Director	Sean Ramsay - Associate Director
Signature	
Date	11.04.2023

Test Institute Engineer	Craig Melrose - Laboratory Manager
Signature	
Date	11.04.2023

1 – Test Results

Name	Comment	Result
1 - Summary		
Vertical ball rebound FIFA Quality		Passed
Vertical ball rebound FIFA Quality Pro		Passed
Angle ball rebound FIFA Quality		Passed
Angle ball rebound FIFA Quality Pro		Passed
Reduced ball roll FIFA Quality		Passed
Reduced ball roll FIFA Quality Pro		Passed
Shock absorption FIFA Quality		Passed
Shock absorption FIFA Quality Pro		Passed
Deformation FIFA Quality		Passed
Deformation FIFA Quality Pro		Passed
Rotational resistance FIFA Quality		Passed
Rotational resistance FIFA Quality Pro		Passed
Skin / surface friction		Passed
Skin abrasion		Passed
1 - Test Details | Object		
Product Name		CCGrass Pride 50-A2 SP
Product ID		-
Synthetic Turf System		CCGrass Pride 50-A2
Performance infill		SBR
Stabilising infill		Sand
Shock-pad or elastic layer		SP-10
Sub-base composition		Rigid engineered base
2 - Test Details | Test Institute		
Date(s) of test		11.04.2023
Report created by		E Steyn
Laboratory Test report number		13173/8375
Test Institute Project number		13173
3 – Product Declaration (Manufacturer)		
Manufacturer		CCGrass
Tuft pattern		Straight
Yarn manufacturer | yarn 1		CCGrass
Product name, code | yarn 1		Pride
Detailed tuft decitex (Dtex) [g/10000m]		2000 x 4 + 2000 x 3
Pile yarn profile | yarn 1		Wave Olive
Pile thickness (µ m) | yarn 1		370.0
Pile colour (RAL) | value 1 | yarn 1		Emerald green

Name	Comment	Result
Pile colour (RAL) | value 2 | yarn 1		Olive green
Pile colour (RAL) | value 3 | yarn 1		-
Pile width (mm) | yarn 1		1.00
Number of tufts/m2 | yarn 1	ISO1773	8190.00
Pile length (mm) | yarn 1	ISO 2549	50.00
Pile weight (g/m2) | yarn 1	ISO 8543	1258.00
Pile yarn characterization | yarn 1		PE
Pile yarn dtex | yarn 1		14000
Yarn manufacturer | yarn 2		
Product name, code | yarn 2		
Pile yarn profile | yarn 2		
Pile thickness (µ m) | yarn 2		
Pile colour (RAL) | value 1 | yarn 2		
Pile colour (RAL) | value 2 | yarn 2		
Pile colour (RAL) | value 3 | yarn 2		
Pile width (mm) | yarn 2		
Number of tufts/m2 | yarn 2	ISO1773	
Pile length (mm) | yarn 2	ISO 2549	
Pile weight (g/m2) | yarn 2	ISO 8543	
Pile yarn characterization | yarn 2		
Pile yarn dtex | yarn 2		
Yarn manufacturer | yarn 3		
Product name, code | yarn 3		
Pile yarn profile | yarn 3		
Pile thickness (µ m) | yarn 3		
Pile colour (RAL) | value 1 | yarn 3		
Pile colour (RAL) | value 2 | yarn 3		
Pile colour (RAL) | value 3 | yarn 3		
Pile width (mm) | yarn 3		
Number of tufts/m2 | yarn 3	ISO1773	
Pile length (mm) | yarn 3	ISO 2549	
Pile weight (g/m2) | yarn 3	ISO 8543	
Pile yarn characterization | yarn 3		
Pile yarn dtex | yarn 3		
Primary backing | Product name, code		Not declared
Primary backing | Manufacturer		YZHX
Re-enforcement scrim | Product name, code		-
Re-enforcement scrim | Manufacturer		-

Name	Comment	Result
Secondary backing | Product name, code		PU
Secondary backing | Manufacturer		CCGrass
Secondary backing | Dry application rate (g/m2)		900.0
Carpet | Minimum tuft withdrawal force (N)		40
Carpet | Carpet mass per unit area [g/m2]		2358.0
Method of jointing		Bonded
Bonded joints | Adhesive brand name		BH
Bonded joints | Adhesive manufacturer		BH
Bonded joints | Application rate (g/m)		300
Bonded joints | Jointing film brand name		YB
Bonded joints | Jointing film manufacturer		YB
Stitched seams | Tread brand name/product code		
Stitched seams | Tread manufacturer		
Stitched seams | Stitch rate (stitch per lm)		
Performance Infill | Product name, code		SBR
Performance Infill | Manufacturer		Local Supplier
Performance Infill | Material grading		0.8 - 2.5 mm
Performance Infill | Particle shape	prEN 14955	Angular
Performance Infill | Particle size range	EN 933-Part 1	0.8 - 2.5 mm
Performance Infill | Bulk density (g/cm3)	EN 1097-3	0.450
Performance Infill | Application rate (kg/m2)		8.0
Stabilising Infill | Product name, code		Sand
Stabilising Infill | Manufacturer		Local Supplier
Stabilising Infill | Material type		Sand
Stabilising Infill | Material grading		0.5 - 1.0 mm
Stabilising Infill | Particle shape	prEN 14955	Rounded
Stabilising Infill | Particle size range	EN 933-Part 1	0.5 - 1.0 mm
Stabilising Infill | Bulk density (g/cm3)	EN 1097-3	1.46

Name	Comment	Result
Stabilising Infill | Application rate (kg/m2)		25.0
Shockpad, E-layer | Product name, code		SP-10
Shockpad, E-layer | Manufacturer		Local Supplier
Shockpad, E-layer | Composition		Prefabricated closed-cell PE Foam
Shockpad, E-layer | Bulk density (g/cm3)		0.05
Shockpad, E-layer| Thickness	EN 1969	10.0
Shockpad, E-layer | Shock absorption (%)	FIFA 4a	36.0
Shockpad, E-layer | Deformation	FIFA 5a	7.1
Shockpad, E-layer | Tensile strength (MPa)		0.15
Shockpad, E-layer | Mass per unit area (kg/m2)		0.5
Other, detail		
3 – Test Results | Player / Surface Interaction		
Rotational Resistance | Initial | Dry (Quality)	27 - 48 Nm	38
Rotational Resistance | Initial | Dry (Pro)	32 - 43 Nm	38
Rotational Resistance | Initial | Wet (Quality)	27 - 48 Nm	36
Rotational Resistance | Initial | Wet (Pro)	32 - 43 Nm	36
Rotational Resistance | after simulated wear | 3'000 cycles (5*)	32 - 43 Nm	43
Rotational Resistance | after simulated wear | 3'000 cycles (20*)	32 - 43 Nm	
Rotational Resistance | after simulated wear | 6'000 cycles (5*)	27 - 48 Nm	44
Rotational Resistance | after simulated wear | 6'000 cycles (20*)	27 - 48 Nm	
3 – Test Results | Product identification field product		
Performance infill | Theremographic analysis | Organic [%] - Product Declaration		63.0
Performance infill | Theremographic analysis | Inorganic [%] - Product Declaration		37.0
Performance infill | Theremographic analysis |		60.0

Name	Comment	Result
Elastomer [%] - Product Declaration		
4 – Product Identification		
Artificial Turf | Carpet mass per unit area [g/m2]		2462
Artificial Turf | Tufts per unit area [m2]		8300
Artificial Turf | Pile lenght above backing [mm]		50.0
Artificial Turf | Pile weight [g/m2]		1193
Detailed tuft decitex (Dtex) [g/10000m]		2067 x 4 + 2063 x 3
Artificial Turf | Water permeability of carpet [mm/h]		2523
Artificial Turf | Free pile height		16
Performance infill | Particle size range [mm]		0.8 - 2.5 mm
Performance infill | Particle shape		A2
Performance infill | Bulk density [g/cm3]		0.422
Performance infill | Infill depth [mm]		17
Performance infill | Thermographic analysis | organic [%]		63
Performance infill | Theremographic analysis | inorganic [%]		37
Stabilising infill | Particle size range [mm]		0.5 - 1.0 mm
Stabilising infill | Particle shape		C2
Stabilising infill | Bulk density [g/cm3]		1.53
Shock pad / E-layer | Shock absorption [%]	if part of supplied system	32.7
Shock pad / E-layer | Deformation	if part of supplied system	6.8
Shock pad / E-layer | Thickness	if part of supplied system	10.0
Other, detail		
5 – Test Results | Ball / Surface interaction		
Vertical Ball Rebound | Initial | Dry (Quality)	0.6 - 1m	0.72
Vertical Ball Rebound | Initial | Dry (Pro)	0.6 - 0.85m	0.72
Vertical Ball Rebound | Initial | Wet (Quality)	0.6 - 1m	0.68

Name	Comment	Result
Vertical Ball Rebound | Initial | Wet (Pro)	0.6 - 0.85m	0.68
Vertical Ball Rebound | after simulated wear | 3'000 cycles (5*)	0.6 - 0.85m	0.80
Vertical Ball Rebound | after simulated wear | 6'000 cycles (5*)	0.6 - 1m	0.79
Vertical Ball Rebound | after simulated wear | 3'000 cycles (20*)	0.6 - 0.85m	
Vertical Ball Rebound | after simulated wear | 6'000 cycles (20*)	0.6 - 1m	
Angle Ball Rebound | Dry	45 - 80 %	51
Angle Ball Rebound | Wet	45 - 80 %	69
Reduced Ball Roll | Initial | Dry (Quality)	4 - 10 m	7.1
Reduced Ball Roll | Initial | Dry (Pro)	4 - 8 m	7.1
Reduced Ball Roll | after simulated wear | 3'000 cycles (5*) | Dry	4 - 8 m	6.4
Reduced Ball Roll | after simulated wear | 3'000 cycles (5*) | Wet	4 - 8 m	6.7
Reduced Ball Roll | after simulated wear | 3'000 cycles (20*) | Dry	4 - 8 m	
Reduced Ball Roll | after simulated wear | 3'000 cycles (20*) | Wet	4 - 8 m	
Reduced Ball Roll | after simulated wear | 6'000 cycles (5*) | Dry	4 - 12 m	8.8
Reduced Ball Roll | after simulated wear | 6'000 cycles (5*) | Wet	4 - 12 m	9.2
Reduced Ball Roll | after simulated wear | 6'000 cycles (20*)| Dry	4 - 12 m	
Reduced Ball Roll | after simulated wear | 6'000 cycles (20*)| Wet	4 - 12 m	
Shock absorption | Initial | Dry (Quality)	57 - 68 %	66.4
Shock absorption | Initial | Dry (Pro)	62 - 68 %	66.4
Shock absorption | Initial | Wet (Quality)	57 - 68 %	66.6
Shock absorption | Initial | Wet (Pro)	62 - 68 %	66.4

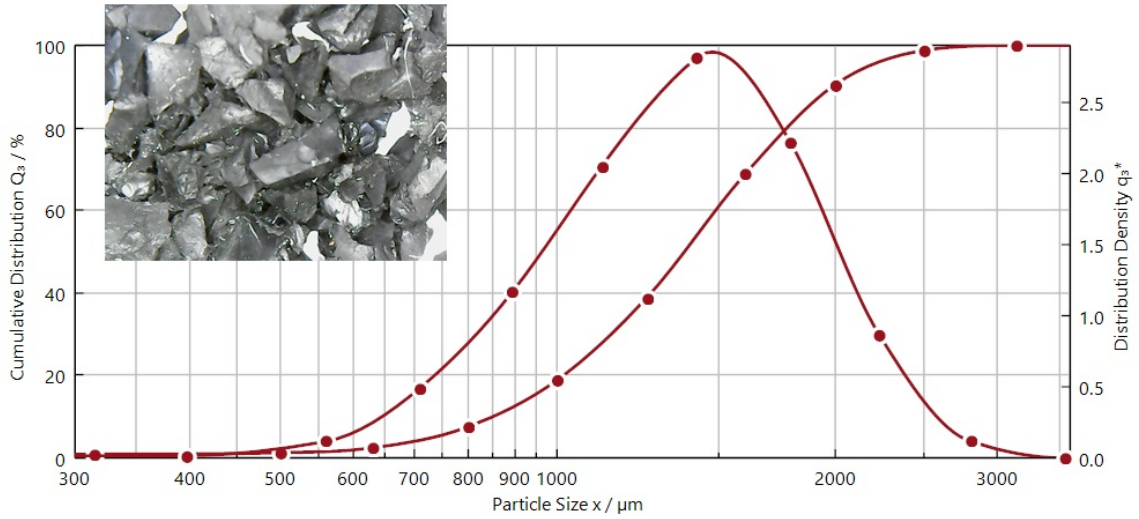
Name	Comment	Result
Shock absorption | after simulated wear | 3'000 cycles (5*)	62 - 68 %	63.2
Shock absorption | after simulated wear | 3'000 cycles (20*)	62 - 68 %	
Shock absorption | after simulated wear | 6'000 cycles (5*)	57 - 68 %	62.6
Shock absorption | after simulated wear | 6'000 cycles (20*)	57 - 68 %	
Shock absorption | 50°C	57 - 68 %	67.50
Shock absorption | -5°C	57 - 68 %	65.90
Other, detail		
5 – Test Results | Player / Surface interaction		
Deformation | Initial | Dry (Quality)	4 - 11 mm	10.0
Deformation | Initial | Dry (Pro)	4 - 10 mm	10.0
Deformation | Initial | Wet (Quality)	4 - 11 mm	10.0
Deformation | Initial | Wet (Pro)	4 - 10 mm	10.0
Deformation | after simulated wear | 3'000 cycles (5*)	4 - 10 mm	9.7
Deformation | after simulated wear | 3'000 cycles (20*)	4 - 10 mm	
Deformation | after simulated wear | 6'000 cycles (5*)	4 - 11 mm	9.7
Deformation | after simulated wear | 6'000 cycles (20*)	4 - 11 mm	
Skin / surface friction | Dry	0.35 - 0.75 µ	0.73
Skin / surface friction | Dry | 3'000 cycles	0.35 - 0.75 µ	0.63
Skin / surface friction | Dry | 6'000 cycles	0.35 - 0.75 µ	0.62
Skin abrasion | Dry	± 30 %	24
Skin abrasion | Dry | 3'000 cycles	± 30 %	23
Skin abrasion | Dry | 6'000 cycles	± 30 %	21
6 – Environmental impact (arficial, light, water)		
Pile yarn 1 | Colour change | after artificial weathering	≥ Grey scale 3	4
Pile yarn 2 | Colour change | after artificial weathering	≥ Grey scale 3	4
Pile yarn 3 | Colour change | after artificial weathering	≥ Grey scale 3	
Pile yarn 1 | Peak Breakage Force | before artificial weathering		14.70
Pile yarn 1 | Peak Breakage Force | after artificial weathering		13.5

Name	Comment	Result
Pile yarn 1 | Peak Breakage Force | Green Reference value before artificial weathering		14.70
Pile yarn 1 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	8.20
Pile yarn 2 | Peak Breakage Force | before artificial weathering		14.10
Pile yarn 2 | Peak Breakage Force | after artificial weathering		13.1
Pile yarn 2| Peak Breakage Force | Green Reference value before artificial weathering		14.70
Pile yarn 2 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	10.90
Pile yarn 3 | Peak Breakage Force | before artificial weathering		
Pile yarn 3 | Peak Breakage Force | after artificial weathering		
Pile yarn 3| Peak Breakage Force | Green Reference value before artificial weathering		
Pile yarn 3 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	
Polymeric infill | Colour change | after artificial weathering	≥ Grey scale 3	4 - 5
Polymeric infill | Visual change in composition | after artificial weathering	No change	No change
Complete system | Water permeability	> 180 mm/h	690
Stitched joints | Strength | un-aged	≥ 1000N/100mm	
Stitched joints | Strength | water aged	≥ 1000N/100mm	
Bonded joints | Strength | un-aged	≥ 75/100mm	119
Bonded joints | Strength | water aged	≥ 75/100mm	81
Carpet tuft | Withdrawal force | un-aged	≥ 40N	85
Carpet tuft | Withdrawal force | water aged	≥ 40N	56
Heat | Category	for information	Category 2 - 3

Name	Comment	Result
7 - Miscellaneous (shock pad, sub-base - if part of the system)		
Shock Pad / E-layer | tensile strength | un-aged	≥ 0.15 MPa	0.29
Sub-base | Composition		
Sub-base | Particle size range		
Sub-base | Particle shape		
Sub-base | Thickness		
Sub-base | Compaction & test method		
Other, detail		Joint results taken from SL Project ref. 13043/8602.
Turf | Product Report Details		
Shockpad, E-layer | Type Category		Prefabricated Shockpad
Performance Infill | Material type Category		End of Life Tires Infill (ELT)
Splash | Characteristics Category		≥ 1.5%

2 – Test Images

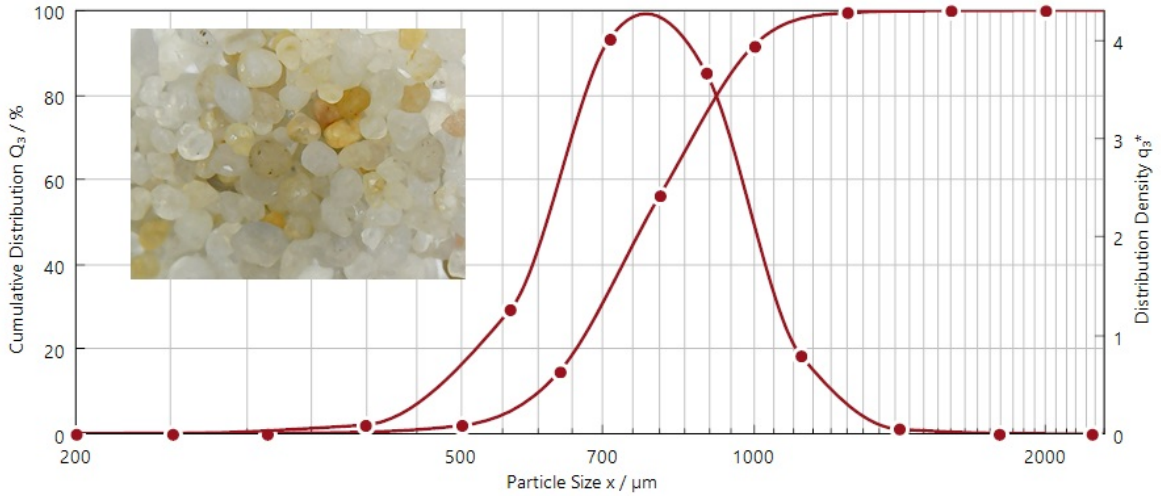
Performance infill particle grading curve



CUMULATIVE DISTRIBUTION

x_o / µm	Q_3 / %	x_o / µm	Q_3 / %				
18.62	0.01	800.00	7.57	13.17	0.000	709.93	0.493
63.00	0.15	1000.00	18.91	34.25	0.003	894.43	1.170
100.00	0.39	1250.00	38.80	79.37	0.012	1118.03	2.053
150.00	0.55	1600.00	68.92	122.47	0.009	1414.21	2.809
200.00	0.67	2000.00	90.45	173.21	0.009	1788.85	2.222
315.00	0.92	2500.00	98.82	251.00	0.013	2236.07	0.863
500.00	1.28	3150.00	100.00	396.86	0.018	2806.24	0.118
630.00	2.46	4000.00	100.00	561.25	0.117	3549.65	0.000

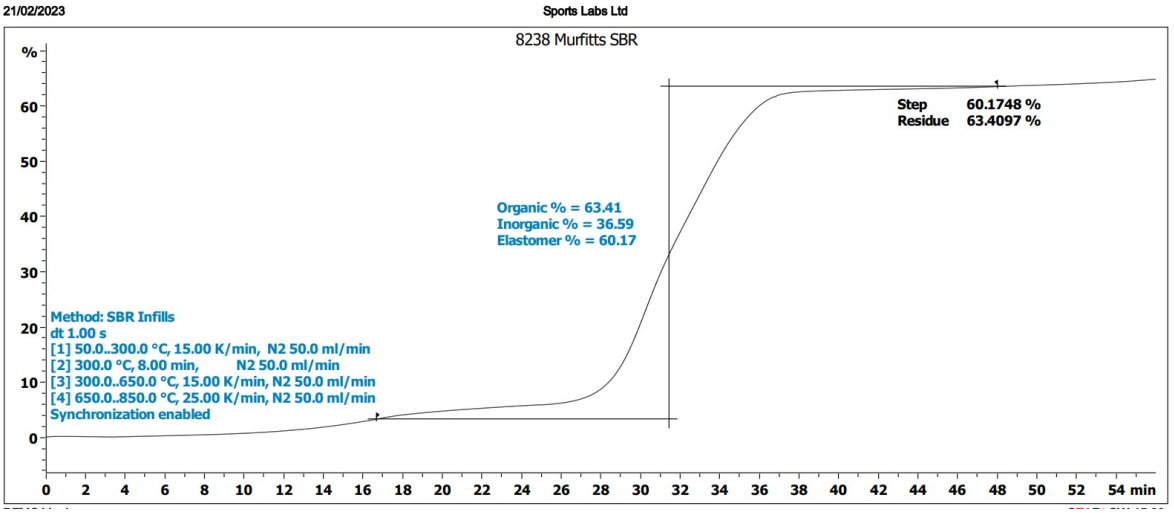
Stabilising infill particle grading curve



CUMULATIVE DISTRIBUTION

x_o / µm	Q_3 / %	x_o / µm	Q_3 / %				
18.62	0.00	630.00	14.63	13.17	0.000	561.25	1.261
63.00	0.02	800.00	56.20	34.25	0.000	709.93	4.007
100.00	0.06	1000.00	91.66	79.37	0.002	894.43	3.659
150.00	0.09	1250.00	99.44	122.47	0.002	1118.03	0.803
200.00	0.12	1600.00	99.94	173.21	0.002	1414.21	0.047
315.00	0.18	2000.00	100.00	251.00	0.003	1788.85	0.006
500.00	1.98	2500.00	100.00	396.86	0.090	2236.07	0.000

TGA of performance infill



Simulated wear - Before 1



Simulated wear - Before 2



Simulated wear - After 1



Simulated wear - After 2



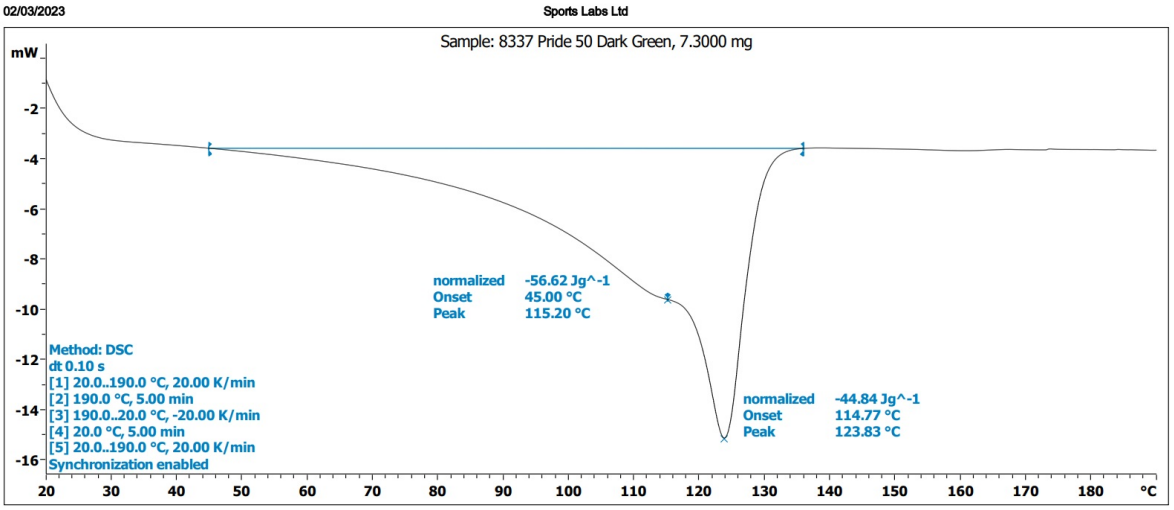
Simulated wear - After 3



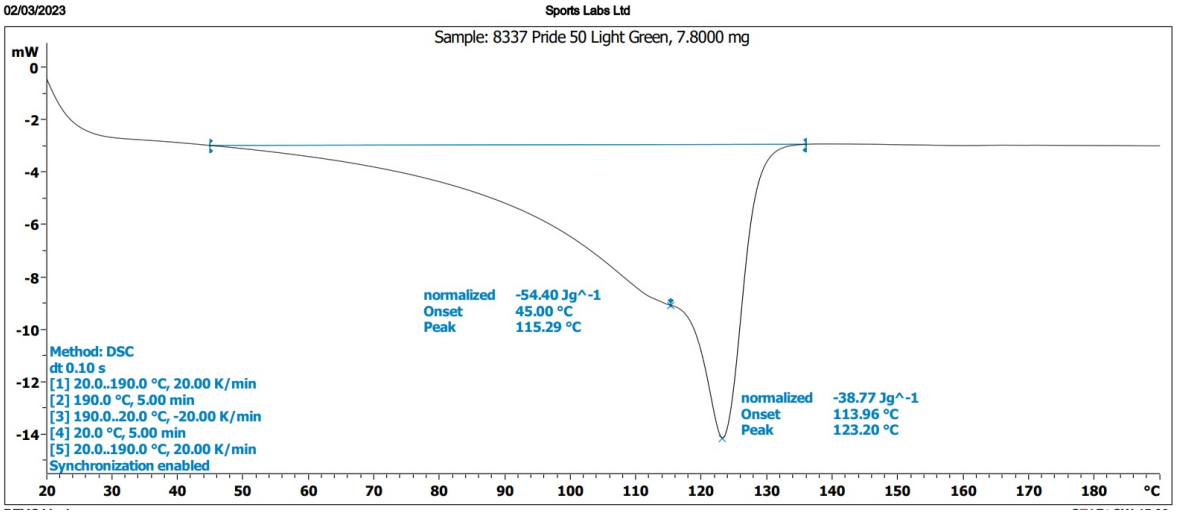
Simulated wear - After 4



Yarn Characteristics DSC



Yarn Characteristics DSC - 2



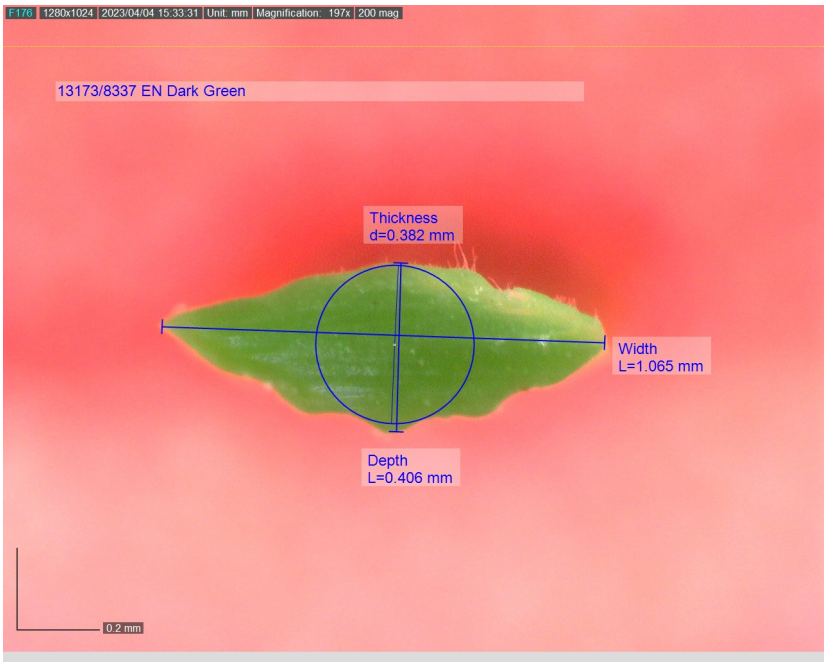
Stabilising Infill - picture



Performance Infill - picture



Cross-section Yarn 1



Cross-section Yarn 2

