



FIFA LABORATORY TEST REPORT

Test manual 2015
01.01.2015

Product	Grass
FIFA Licensee	
Test Institute	Labosport Italia S.r.l.
Test Number	100127
External Test Number	19-0905IT
Date of Test	15.01.2020
Test Result	Passed
Quality Level	FIFA Quality & Quality PRO
Test Type	Initial



Licensee

Main Address

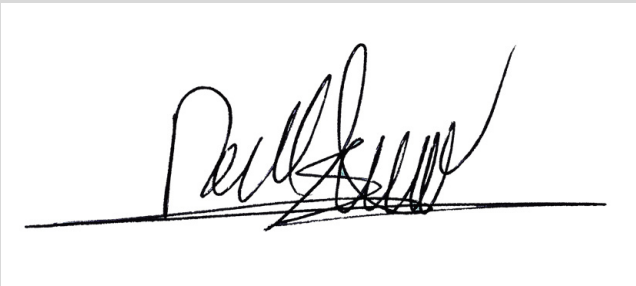
Name	[REDACTED]
Address	[REDACTED] [REDACTED] [REDACTED]
ZIP / City	[REDACTED] / ISTANBUL
Website	
Contact Email	[REDACTED]@m.tr
Contact Phone	

Test institute

Main Address

Name	Labosport Italia S.r.l.
Address	Labosport Italia S.r.l. Via Monza, 80
ZIP / City	23870 / CERNUSCO LOMBARDONE
Website	www.labosport.com
Contact Email	labosport@labosport.it
Contact Phone	+39/ 039 896 26 84

Approval

Test Institute Director	Roberto Armeni
Signature	
Date	04.03.2020
Test Institute Engineer	Matteo Giorgini
Signature	
Date	04.03.2020



1 – Test Results

Name	Comment	Result
3 – Test Results Product identification field product		
Performance infill Thermographic analysis Elastomer [%] - Product Declaration		34.6
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		GRASS
Product ID		-
Synthetic Turf System		GRASS
Performance infill		EPDM
Stabilising infill		SILICA
Shock-pad or elastic layer		-
Sub-base composition		Rigid engineered Base
2 - Test Details Test Institute		
Date(s) of test		15.01.2020
Report created by		Matteo Giorgini
Laboratory Test report number		19-0905IT
Test Institute Project number		19-0905IT
3 – Product Declaration (Manufacturer)		
Manufacturer		
Tuft pattern		STRAIGHT
Yarn manufacturer yarn 1		TenCate Thiolon B.V.
Product name, code yarn 1		MS XQ 1750/1 MF



Name	Comment	Result
		P Field Green, S106
Pile yarn profile yarn 1		See test report details
Pile thickness (μ m) yarn 1		300.0
Pile colour (RAL) value 1 yarn 1		RAL 130 40 30
Pile colour (RAL) value 2 yarn 1		-
Pile colour (RAL) value 3 yarn 1		-
Pile width (mm) yarn 1		1.40
Number of tufts/m ² yarn 1	ISO1773	9000.00
Pile length (mm) yarn 1	ISO 2549	58.00
Pile weight (g/m ²) yarn 1	ISO 8543	675.00
Pile yarn characterization yarn 1		PE
Pile yarn dtex yarn 1		6000
Yarn manufacturer yarn 2		TenCate Thiolon B.V.
Product name, code yarn 2		MS XQ 1750/1 MF P Olive Green, S103
Pile yarn profile yarn 2		See test report details
Pile thickness (μ m) yarn 2		300.0
Pile colour (RAL) value 1 yarn 2		RAL 110 40 30
Pile colour (RAL) value 2 yarn 2		-
Pile colour (RAL) value 3 yarn 2		-
Pile width (mm) yarn 2		1.40
Number of tufts/m ² yarn 2	ISO1773	9000.00
Pile length (mm) yarn 2	ISO 2549	58.00
Pile weight (g/m ²) yarn 2	ISO 8543	675.00
Pile yarn characterization yarn 2		PE
Pile yarn dtex yarn 2		6000.0
Yarn manufacturer yarn 3		-
Product name, code yarn 3		-
Pile yarn profile yarn 3		-
Pile thickness (μ m) yarn 3		0.0
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		0.00
Number of tufts/m ² yarn 3	ISO1773	0.00
Pile length (mm) yarn 3	ISO 2549	0.00
Pile weight (g/m ²) yarn 3	ISO 8543	0.00
Pile yarn characterization yarn 3		-
Pile yarn dtex yarn 3		0.0



Name	Comment	Result
Primary backing Product name, code		H18 Tencate
Primary backing Manufacturer		Tencate
Re-enforcement scrim Product name, code		-
Re-enforcement scrim Manufacturer		-
Secondary backing Product name, code		SBR LATEX
Secondary backing Manufacturer		Styron
Secondary backing Dry application rate (g/m ²)		1100.0
Carpet Minimum tuft withdrawal force (N)		40
Carpet Carpet mass per unit area (g/m ²)		2770.0
Method of jointing		Bonded joints
Bonded joints Adhesive brand name		[REDACTED] FLOOR
Bonded joints Adhesive manufacturer		[REDACTED] FLOOR
Bonded joints Application rate (g/m)		200
Bonded joints Jointing film brand name		HELMETIN
Bonded joints Jointing film manufacturer		SERTA TEKSTİL
Stitched seams Tread brand name/product code		-
Stitched seams Tread manufacturer		-
Stitched seams Stitch rate (stitch per 1m)		0.000
Performance Infill Product name, code		[REDACTED] EPDM RUBBER
Performance Infill Manufacturer		[REDACTED]
Performance Infill Material type		EPDM
Performance Infill Material grading		1,6-3,35
Performance Infill Particle shape	prEN 14955	A2-B3
Performance Infill Particle size range	EN 933-Part 1	1,6-3,35
Performance Infill Bulk density (g/cm ³)	EN 1097-3	0.460
Performance Infill Application rate (kg/m ²)		17.0
Stabilising Infill Product name, code		SILICA SAND
Stabilising Infill Manufacturer		EMEK AND FARES KUM



Name	Comment	Result
Stabilising Infill Material type		SILICA
Stabilising Infill Material grading		0,315-0,8
Stabilising Infill Particle shape	prEN 14955	Round high sphericity – C1
Stabilising Infill Particle size range	EN 933-Part 1	0,315-0,8
Stabilising Infill Bulk density (g/cm3)	EN 1097-3	1.50
Stabilising Infill Application rate (kg/m2)		15.0
Shockpad, E-layer Product name, code		-
Shockpad, E-layer Manufacturer		-
Shockpad, E-layer Type		-
Shockpad, E-layer Composition		-
Shockpad, E-layer Bulk density (g/cm3)		0.00
Shockpad, E-layer Thickness	EN 1969	0.0
Shockpad, E-layer Shock absorption (%)	FIFA 4a	0.0
Shockpad, E-layer Deformation	FIFA 5a	0.0
Shockpad, E-layer Tensile strength (MPa)		0.00
Shockpad, E-layer Mass per unit area (kg/m2)		0.0
Other, detail		-
3 – Test Results Player / Surface Interaction		
Rotational Resistance Initial Dry (Quality)	27 - 48 Nm	39
Rotational Resistance Initial Dry (Pro)	32 - 43 Nm	39
Rotational Resistance Initial Wet (Quality)	27 - 48 Nm	37
Rotational Resistance Initial Wet (Pro)	32 - 43 Nm	37
Rotational Resistance after simulated wear 3'000 cycles (5*)	32 - 43 Nm	36
Rotational Resistance after simulated wear 3'000 cycles (20*)	32 - 43 Nm	0
Rotational Resistance after simulated wear 6'000 cycles (5*)	27 - 48 Nm	39
Rotational Resistance after simulated wear 6'000 cycles (20*)	27 - 48 Nm	0
3 – Test Results Product identification field product		
Performance infill Thermographic analysis Inorganic [%] - Product Declaration		50.4



Name	Comment	Result
Performance infill Thermographic analysis Organic [%] - Product Declaration		49.6
4 – Product Identification		
Artificial Turf Carpet mass per unit area [g/m ²]		3012
Artificial Turf Tufts per unit area [m ²]		9063
Artificial Turf Pile length above backing [mm]		58.0
Artificial Turf Pile weight [g/m ²]		1404
Artificial Turf Water permeability of carpet [mm/h]		3130
Artificial Turf Free pile height		15
Performance infill Particle size range [mm]		1.25 - 4.0
Performance infill Particle shape		A2-B3
Performance infill Bulk density [g/cm ³]		0.460
Performance infill Infill depth [mm]		36
Performance infill Thermographic analysis organic [%]		51
Performance infill Thermographic analysis inorganic [%]		49
Stabilising infill Particle size range [mm]		0.2 - 0.63
Stabilising infill Particle shape		C1
Stabilising infill Bulk density [g/cm ³]		1.32
Shock pad / E-layer Shock absorption [%]	if part of supplied system	0.0
Shock pad / E-layer Deformation	if part of supplied system	0.0
Shock pad / E-layer Thickness	if part of supplied system	0.0
Other, detail		-
5 – Test Results Ball / Surface interaction		
Vertical Ball Rebound Initial Dry (Quality)	0.6 - 1m	0.83
Vertical Ball Rebound Initial Dry (Pro)	0.6 - 0.85m	0.83
Vertical Ball Rebound Initial Wet (Quality)	0.6 - 1m	0.79
Vertical Ball Rebound Initial Wet (Pro)	0.6 - 0.85m	0.79
Vertical Ball Rebound after simulated wear 3'000 cycles (5*)	0.6 - 0.85m	0.85



Name	Comment	Result
Vertical Ball Rebound after simulated wear 6'000 cycles (5*)	0.6 - 1m	0.92
Vertical Ball Rebound after simulated wear 3'000 cycles (20*)	0.6 - 0.85m	0.00
Vertical Ball Rebound after simulated wear 6'000 cycles (20*)	0.6 - 1m	0.00
Angle Ball Rebound Dry	45 - 80 %	50
Angle Ball Rebound Wet	45 - 80 %	63
Reduced Ball Roll Initial Dry (Quality)	4 - 10 m	7.2
Reduced Ball Roll Initial Dry (Pro)	4 - 8 m	7.2
Reduced Ball Roll after simulated wear 3'000 cycles (5*) Dry	4 - 8 m	7.6
Reduced Ball Roll after simulated wear 3'000 cycles (5*) Wet	4 - 8 m	7.9
Reduced Ball Roll after simulated wear 3'000 cycles (20*) Dry	4 - 8 m	0.0
Reduced Ball Roll after simulated wear 3'000 cycles (20*) Wet	4 - 8 m	0.0
Reduced Ball Roll after simulated wear 6'000 cycles (5*) Dry	4 - 12 m	8.3
Reduced Ball Roll after simulated wear 6'000 cycles (5*) Wet	4 - 12 m	8.5
Reduced Ball Roll after simulated wear 6'000 cycles (20*) Dry	4 - 12 m	0.0
Reduced Ball Roll after simulated wear 6'000 cycles (20*) Wet	4 - 12 m	0.0
Shock absorption Initial Dry (Quality)	57 - 68 %	66.0
Shock absorption Initial Dry (Pro)	62 - 68 %	66.0
Shock absorption Initial Wet (Quality)	57 - 68 %	64.5
Shock absorption Initial Wet (Pro)	62 - 68 %	64.5
Shock absorption after simulated wear 3'000 cycles (5*)	62 - 68 %	62.2
Shock absorption after simulated wear 3'000 cycles (20*)	62 - 68 %	0.0
Shock absorption after simulated wear 6'000 cycles (5*)	57 - 68 %	57.8



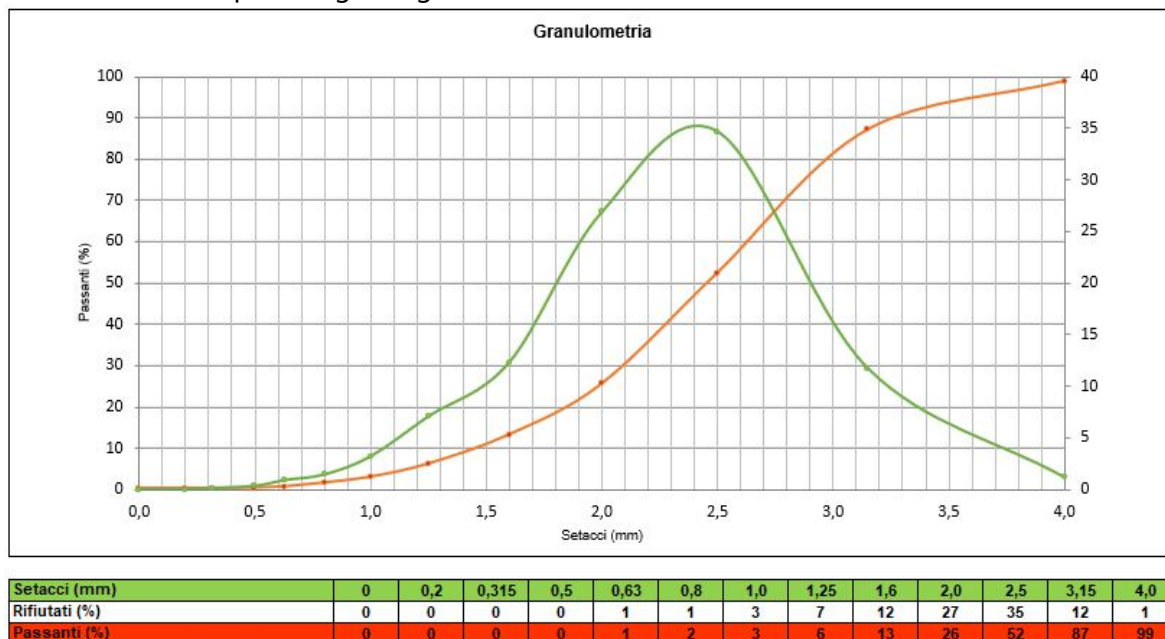
Name	Comment	Result
Shock absorption after simulated wear 6'000 cycles (20*)	57 - 68 %	0.0
Shock absorption 50°C	57 - 68 %	67.70
Shock absorption -5°C	57 - 68 %	67.20
Other, detail		-
5 – Test Results Player / Surface interaction		
Deformation Initial Dry (Quality)	4 - 11 mm	10.0
Deformation Initial 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	9.0
Deformation after simulated wear 3'000 cycles (20*)	4 - 10 mm	0.0
Deformation after simulated wear 6'000 cycles (5*)	4 - 11 mm	8.0
Deformation after simulated wear 6'000 cycles (20*)	4 - 11 mm	0.0
Skin / surface friction Dry	0.35 - 0.75 μ	0.45
Skin / surface friction Dry 3'000 cycles	0.35 - 0.75 μ	0.54
Skin / surface friction Dry 6'000 cycles	0.35 - 0.75 μ	0.61
Skin abrasion Dry	$\pm$ 30 %	7
Skin abrasion Dry 3'000 cycles	$\pm$ 30 %	20
Skin abrasion Dry 6'000 cycles	$\pm$ 30 %	23
6 – Environmental impact (artificial, light, water)		
Pile yarn 1 Colour change after artificial weathering	$\geq$ Grey scale 3	4-5
Pile yarn 2 Colour change after artificial weathering	$\geq$ Grey scale 3	4-5
Pile yarn 3 Colour change after artificial weathering	$\geq$ Grey scale 3	-
Pile yarn 1 Yarn tensile strength after artificial weathering	Change $\leq$ 50 %	0
Pile yarn 2 Yarn tensile strength after artificial weathering	Change $\leq$ 50 %	17.4
Pile yarn 3 Yarn tensile strength after artificial weathering	Change $\leq$ 50 %	-
Polymeric infill Colour change after artificial weathering	$\geq$ Grey scale 3	5
Polymeric infill Visual change in composition after artificial weathering	No change	No change
Complete system Water permeability	> 180 mm/h	638
Stitched joints Strength un-aged	$\geq$ 1000N/100mm	0
Stitched joints Strength water aged	$\geq$ 1000N/100mm	0



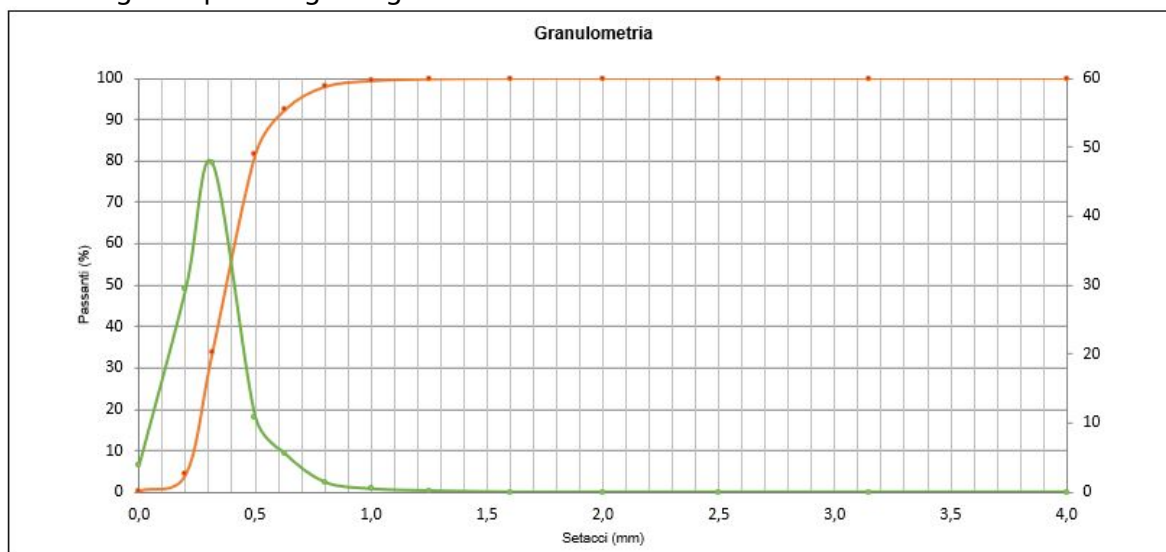
Name	Comment	Result
Bonded joints Strength un-aged	$\geq 75/100\text{mm}$	100
Bonded joints Strength water aged	$\geq 75/100\text{mm}$	93
Carpet tuft Withdrawal force un-aged	$\geq 30\text{N}$	48
Carpet tuft Withdrawal force water aged	$\geq 30\text{N}$	44
Heat Category	for information	Category 3
Splash Characteristics	for information	> 1.50%
7 - Miscellaneous (shock pad, sub-base - if part of the system)		
Shock Pad / E-layer tensile strength un-aged	$\geq 0.15 \text{ MPa}$	0.00
Sub-base Composition		-
Sub-base Particle size range		-
Sub-base Particle shape		-
Sub-base Thickness		-
Sub-base Compaction & test method		-
Other, detail		-

2 – Test Images

Performance infill particle grading curve



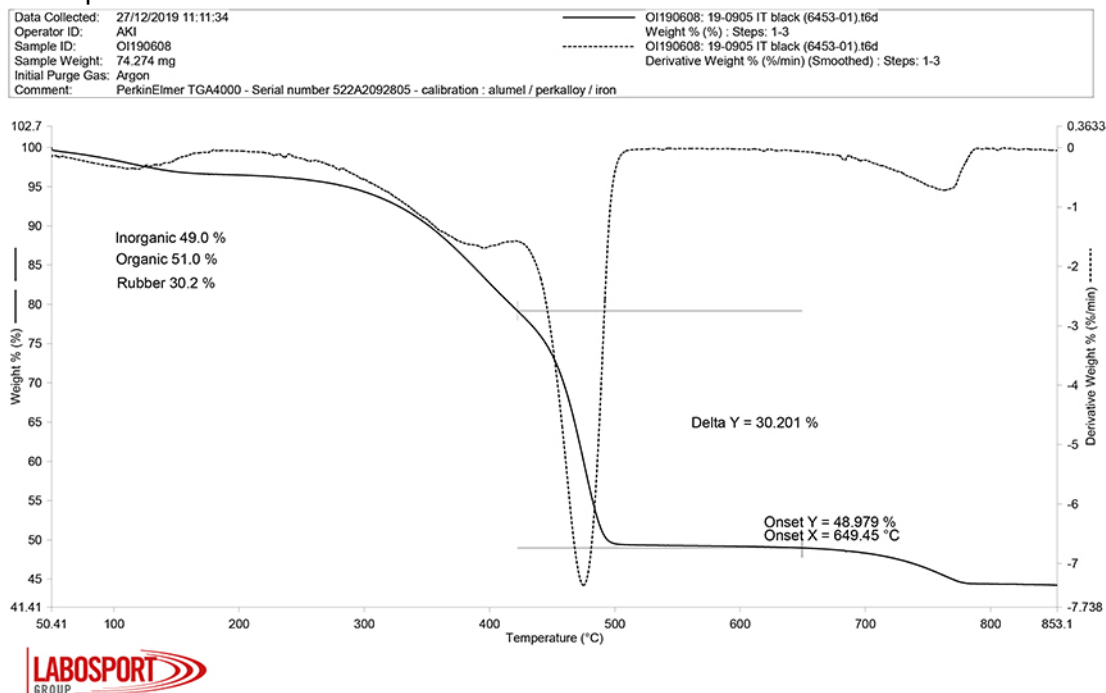
Stabilising infill particle grading curve



Setacci (mm)	0	0,2	0,315	0,5	0,63	0,8	1,0	1,25	1,6	2,0	2,5	3,15	4,0
Rifiutati (%)	4	29	48	11	5	1	0	0	0	0	0	0	0
Passanti (%)	0	4	34	82	92	98	99	100	100	100	100	100	100



TGA of performance infill



- 1) Hold for 1.0 min at 50.00°C
- 2) Heat from 50.00°C to 850.00°C at 10.00°C/min
- 3) Hold for 1.0 min at 850.00°C

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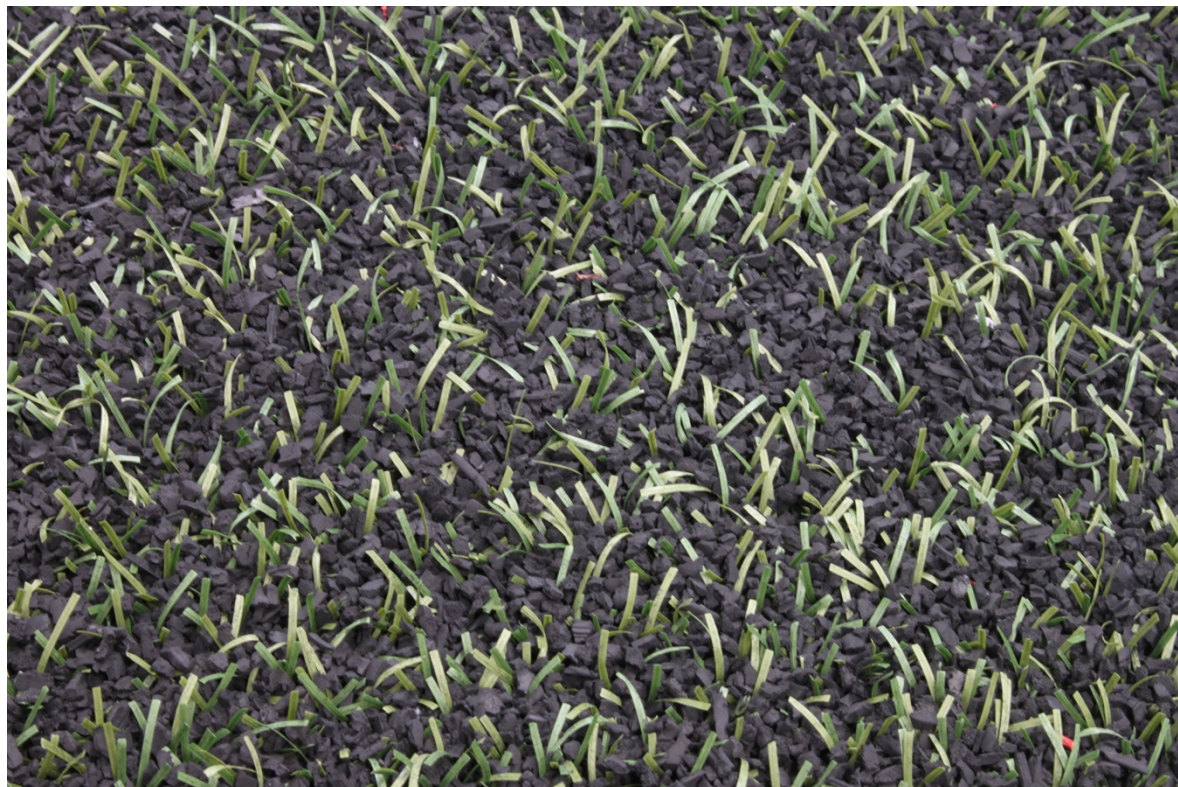
Simulated wear - Before 1



Simulated wear - Before 2



Simulated wear - After 1



Simulated wear - After 2



Simulated wear - After 3



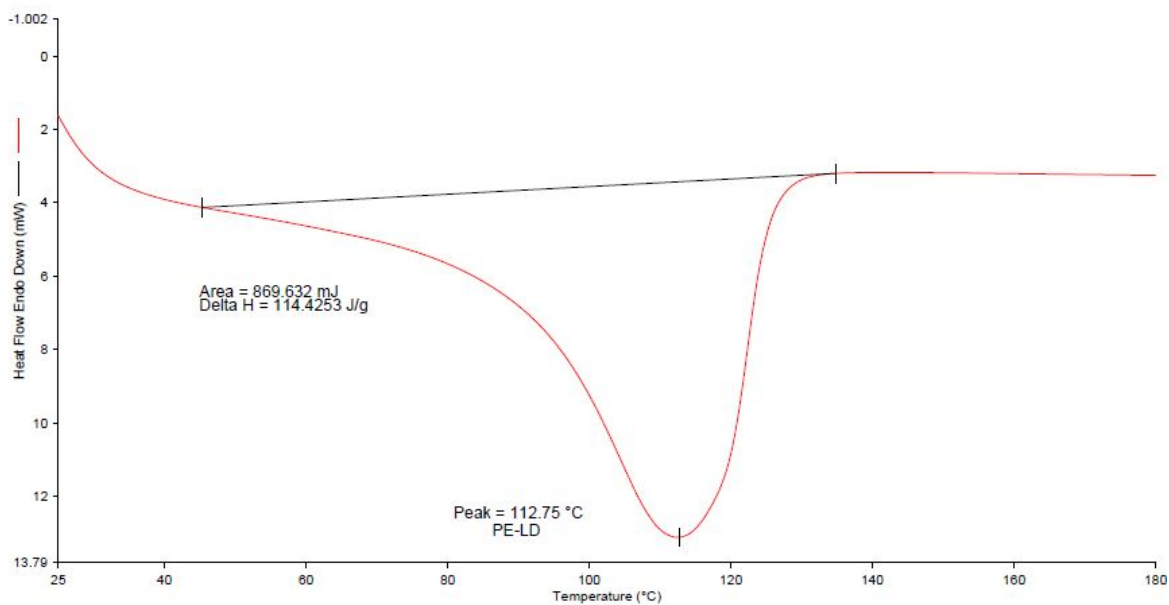
Simulated wear - After 4





Yarn Characteristics DSC

Filename: C:\P...\S09245 Field Green - 19-0903 IT.d6d
 Operator ID: SP
 Sample ID: S09245 Field Green
 Sample Weight: 7.600 mg
 Comment: 19-0903 IT



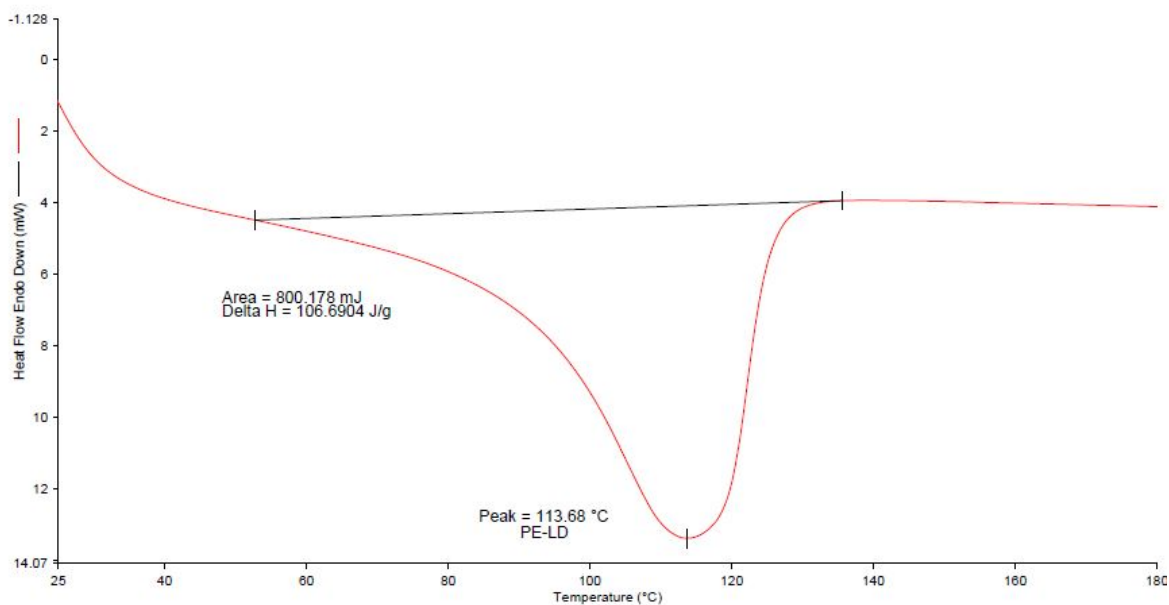
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- | | |
|---|---|
| 1) Heat from 20.00°C to 190.00°C at 20.00°C/min | 4) Hold for 5.0 min at 20.00°C |
| 2) Hold for 5.0 min at 190.00°C | 5) Heat from 20.00°C to 190.00°C at 20.00°C/min |
| 3) Cool from 190.00°C to 20.00°C at 20.00°C/min | |



Yarn Characteristics DSC - 2

Filename: C:\P...\S09244 Olive Green - 19-0903 IT.d6d
 Operator ID: SP
 Sample ID: S09244 Olive Green
 Sample Weight: 7.500 mg
 Comment: 19-0903 IT



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- | | |
|---|---|
| 1) Heat from 20.00°C to 190.00°C at 20.00°C/min | 4) Hold for 5.0 min at 20.00°C |
| 2) Hold for 5.0 min at 190.00°C | 5) Heat from 20.00°C to 190.00°C at 20.00°C/min |
| 3) Cool from 190.00°C to 20.00°C at 20.00°C/min | |

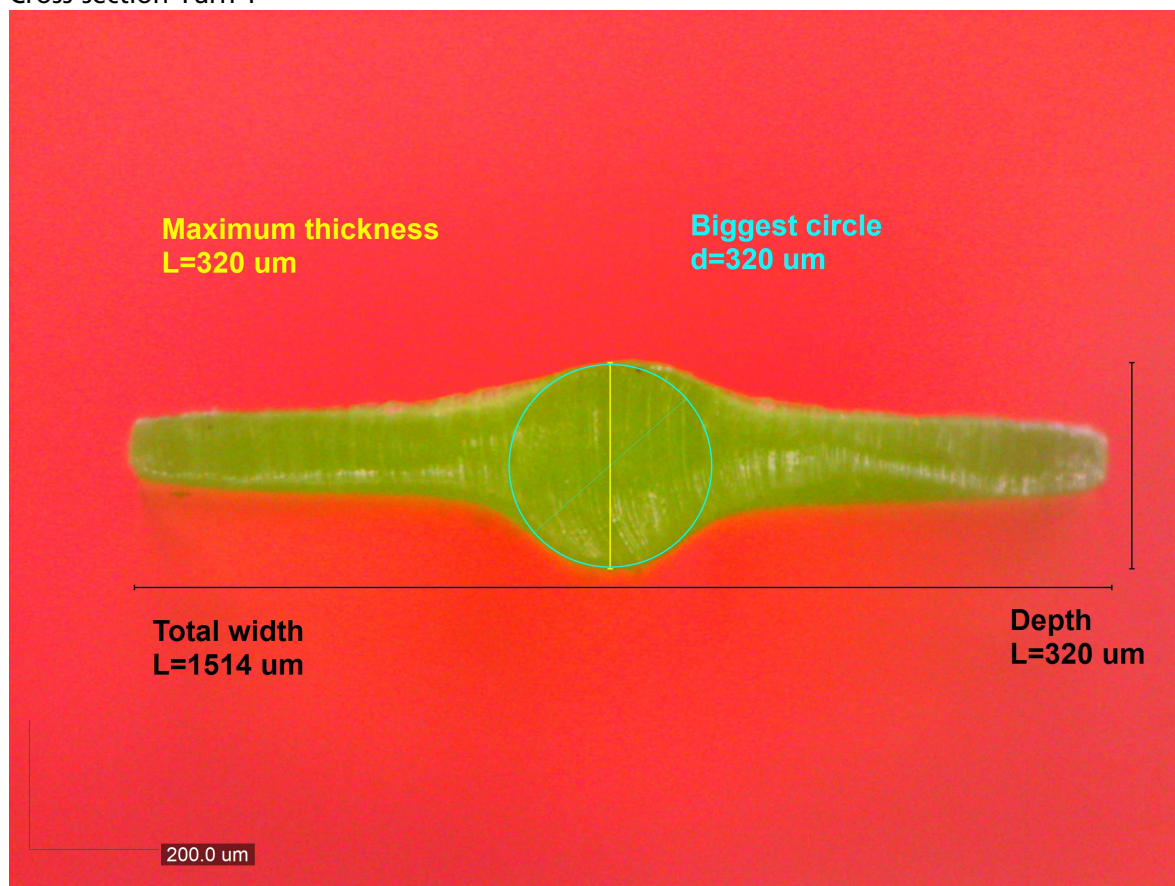
Stabilising Infill - picture



Performance Infill - picture



Cross-section Yarn 1



Cross-section Yarn 2

