FIFA LABORATORY TEST REPORT

TM Football Turf I 2015
01.01.2015

Product	HYBRID XWR PRO
FIFA Licensee	Nurteks Hali San.ve Tic. A.S.
Test Institute	Labosport Italia S.r.l.

Test Number	125888
External Test Number	22-0177IT
Date of Test	13.04.2022
Test Result	Passed
Quality Level	FIFA Quality & Quality PRO
Test Type	Initial

Licensee

Main Address

Name	Nurteks Hali San.ve Tic. A.S.
Address	Nurteks Hali San.ve Tic. A.S. Yesilköy Mah. Atatürk Cad. EGS Bloklari No:12 B2 Blok Kat:4
ZIP / City	34149 / ISTANBUL
Website	
Contact Email	sales@nurteks.com.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	12.05.2022

Test Institute Engineer	Gabriele Greco
Signature	
Date	12.05.2022

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		HYRBID XWR PRO 132/6
Product ID		-
Synthetic Turf System		-
Performance infill		BLACK SBR
Stabilising infill		SILICA SAND
Shock-pad or elastic layer		-
Sub-base composition		Rigid engineered base
2 - Test Details | Test Institute		
Date(s) of test		13.04.2022
Report created by		Gabriele Greco
Laboratory Test report number		22-0177IT

Name	Comment	Result
Test Institute Project number		22-0177IT
3 – Product Declaration (Manufacturer)		
Manufacturer		Nurteks Halı San. Tic. As.
Tuft pattern		STRAIGHT
Yarn manufacturer | yarn 1		TenCate
Product name, code | yarn 1		MS D2 2200x3 XWR FIELD GREEN, S17
Detailed tuft decitex (Dtex) [g/10000m]		19500
Pile yarn profile | yarn 1		Elipse
Pile thickness (µ m) | yarn 1		360.0
Pile colour (RAL) | value 1 | yarn 1		RAL 120 40 30
Pile colour (RAL) | value 2 | yarn 1		-
Pile colour (RAL) | value 3 | yarn 1		-
Pile width (mm) | yarn 1		1.10
Number of tufts/m2 | yarn 1	ISO1773	8260.00
Pile length (mm) | yarn 1	ISO 2549	60.00
Pile weight (g/m2) | yarn 1	ISO 8543	745.00
Pile yarn characterization | yarn 1		PE
Pile yarn dtex | yarn 1		7000
Yarn manufacturer | yarn 2		TenCate Thiolon B.V
Product name, code | yarn 2		MS D2 2200x3 XWR LIME GREEN, S18
Pile yarn profile | yarn 2		Elipse
Pile thickness (µ m) | yarn 2		360.0
Pile colour (RAL) | value 1 | yarn 2		RAL 110 40 40
Pile colour (RAL) | value 2 | yarn 2		-
Pile colour (RAL) | value 3 | yarn 2		-
Pile width (mm) | yarn 2		1.10

Name	Comment	Result
Number of tufts/m2 | yarn 2	ISO1773	8260.00
Pile length (mm) | yarn 2	ISO 2549	60.00
Pile weight (g/m2) | yarn 2	ISO 8543	745.00
Pile yarn characterization | yarn 2		PE
Pile yarn dtex | yarn 2		7000.0
Yarn manufacturer | yarn 3		TenCate
Product name, code | yarn 3		TN 5500/1 LIME GREEN
Pile yarn profile | yarn 3		Fibrile
Pile thickness (µm) | yarn 3		120.0
Pile colour (RAL) | value 1 | yarn 3		LIME GREEN
Pile colour (RAL) | value 2 | yarn 3		-
Pile colour (RAL) | value 3 | yarn 3		-
Pile width (mm) | yarn 3		0.00
Number of tufts/m2 | yarn 3	ISO1773	8260.00
Pile length (mm) | yarn 3	ISO 2549	60.00
Pile weight (g/m2) | yarn 3	ISO 8543	595.00
Pile yarn characterization | yarn 3		PE
Pile yarn dtex | yarn 3		5500.0
Primary backing | Product name, code		H18
Primary backing | Manufacturer		Tencate
Re-enforcement scrim | Product name, code		-
Re-enforcement scrim | Manufacturer		-
Secondary backing | Product name, code		SBR LATEKS

Name	Comment	Result
Secondary backing | Manufacturer		Styron
Secondary backing | Dry application rate (g/m2)		1200.0
Carpet | Minimum tuft withdrawal force (N)		>40
Carpet | Carpet mass per unit area [g/m2]		3525.0
Method of jointing		Bonded
Bonded joints | Adhesive brand name		Ayka Floor
Bonded joints | Adhesive manufacturer		Ayka Floor
Bonded joints | Application rate (g/m)		200
Bonded joints | Jointing film brand name		Helmetin
Bonded joints | Jointing film manufacturer		SERTA TEKSTİL ÜRÜNLERİ SANAYİ VE PAZARLAMA LTD. ŞTİ.
Stitched seams | Tread brand name/product code		-
Stitched seams | Tread manufacturer		-
Stitched seams | Stitch rate (stitch per lm)		0.000
Performance Infill | Product name, code		NRT SBR RUBBER
Performance Infill | Manufacturer		NURTEKS HALI SAN. TİC.AS.
Performance Infill | Material grading		1 - 3,15
Performance Infill | Particle shape	prEN 14955	A2 - B3
Performance Infill | Particle size range	EN 933-Part 1	1 - 3,15

Name	Comment	Result
Performance Infill | Bulk density (g/cm3)	EN 1097-3	0.450
Performance Infill | Application rate (kg/m2)		16.0
Stabilising Infill | Product name, code		SILICA SAND
Stabilising Infill | Manufacturer		Emek, Fares Kum
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)		20.0
Shockpad, E-layer | Product name, code		-
Shockpad, E-layer | Manufacturer		-
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	41

Name	Comment	Result
Rotational Resistance | Initial | Dry (Pro)	32 - 43 Nm	41
Rotational Resistance | Initial | Wet (Quality)	27 - 48 Nm	40
Rotational Resistance | Initial | Wet (Pro)	32 - 43 Nm	40
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	0
Rotational Resistance | after simulated wear | 6'000 cycles (5*)	27 - 48 Nm	45
Rotational Resistance | after simulated wear | 6'000 cycles (20*)	27 - 48 Nm	0
3 – Test Results | Product identification field product		
Performance infill | Theremographic analysis | Organic [%] - Product Declaration		64.8
Performance infill | Theremographic analysis | Inorganic [%] - Product Declaration		35.2
Performance infill | Theremographic analysis | Elastomer [%] - Product Declaration		58.7
4 – Product Identification		
Artificial Turf | Carpet mass per unit area [g/m2]		3270
Artificial Turf | Tufts per unit area [m2]		8127
Artificial Turf | Pile lenght above backing [mm]		60.0

Name	Comment	Result
Artificial Turf | Pile weight [g/m2]		1977
Detailed tuft decitex (Dtex) [g/10000m]		18850
Artificial Turf | Water permeability of carpet [mm/h]		4716
Artificial Turf | Free pile height		13
Performance infill | Particle size range [mm]		1,25 - 3,15
Performance infill | Particle shape		A2 - B3
Performance infill | Bulk density [g/cm3]		0.470
Performance infill | Infill depth [mm]		47
Performance infill | Thermographic analysis | organic [%]		64
Performance infill | Theremographic analysis | inorganic [%]		36
Stabilising infill | Particle size range [mm]		0,315 - 1,0
Stabilising infill | Particle shape		C1
Stabilising infill | Bulk density [g/cm3]		1.49
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		Due to different DSC devices and potential difference in the test method used, the shape and peak temperatures of the DSC analysis may differ from the FIFA requirement.

Name	Comment	Result
		Field Green Fibrillated UVA report SPORTSLABS number 17162/2366 issued on 16/12/2016.
5 – Test Results | Ball / Surface interaction		
Vertical Ball Rebound | Initial | Dry (Quality)	0.6 - 1m	0.73
Vertical Ball Rebound | Initial | Dry (Pro)	0.6 - 0.85m	0.73
Vertical Ball Rebound | Initial | Wet (Quality)	0.6 - 1m	0.71
Vertical Ball Rebound | Initial | Wet (Pro)	0.6 - 0.85m	0.71
Vertical Ball Rebound | after simulated wear | 3'000 cycles (5*)	0.6 - 0.85m	0.83
Vertical Ball Rebound | after simulated wear | 6'000 cycles (5*)	0.6 - 1m	0.86
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 %	53
Angle Ball Rebound | Wet	45 - 80 %	62
Reduced Ball Roll | Initial | Dry (Quality)	4 - 10 m	6.3
Reduced Ball Roll | Initial | Dry (Pro)	4 - 8 m	6.3
Reduced Ball Roll | after simulated wear | 3'000 cycles (5*) | Dry	4 - 8 m	7.1
Reduced Ball Roll | after simulated wear | 3'000 cycles (5*) | Wet	4 - 8 m	7.3
Reduced Ball Roll | after simulated wear | 3'000 cycles (20*) | Dry	4 - 8 m	0.0

Name	Comment	Result
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	7.6
Reduced Ball Roll | after simulated wear | 6'000 cycles (5*) | Wet	4 - 12 m	7.8
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 %	65.0
Shock absorption | Initial | Dry (Pro)	62 - 68 %	65.0
Shock absorption | Initial | Wet (Quality)	57 - 68 %	64.4
Shock absorption | Initial | Wet (Pro)	62 - 68 %	64.4
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 %	58.4
Shock absorption | after simulated wear | 6'000 cycles (20*)	57 - 68 %	0.0
Shock absorption | 50°C	57 - 68 %	67.90
Shock absorption | -5°C	57 - 68 %	64.20
Other, detail		-
5 – Test Results | Player / Surface interaction		

Name	Comment	Result
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	8.9
Deformation | Initial | Wet (Pro)	4 - 10 mm	8.9
Deformation | after simulated wear | 3'000 cycles (5*)	4 - 10 mm	8.0
Deformation | after simulated wear | 3'000 cycles (20*)	4 - 10 mm	0.0
Deformation | after simulated wear | 6'000 cycles (5*)	4 - 11 mm	7.3
Deformation | after simulated wear | 6'000 cycles (20*)	4 - 11 mm	0.0
Skin / surface friction | Dry	0.35 - 0.75 µ	0.64
Skin / surface friction | Dry | 3'000 cycles	0.35 - 0.75 µ	0.65
Skin / surface friction | Dry | 6'000 cycles	0.35 - 0.75 µ	0.68
Skin abrasion | Dry	± 30 %	23
Skin abrasion | Dry | 3'000 cycles	± 30 %	26
Skin abrasion | Dry | 6'000 cycles	± 30 %	28
6 – Environmental impact (arficial, light, water)		
Pile yarn 1 | Colour change | after artificial weathering	≥ Grey scale 3	4-5
Pile yarn 2 | Colour change | after artificial weathering	≥ Grey scale 3	4
Pile yarn 3 | Colour change | after artificial weathering	≥ Grey scale 3	4

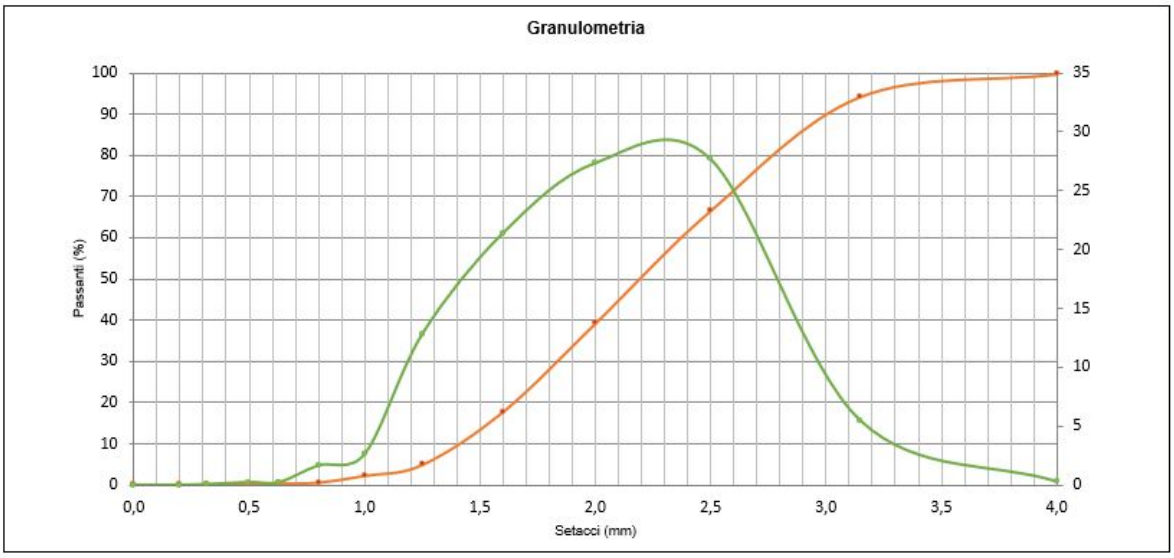
Name	Comment	Result
Pile yarn 1 | Peak Breakage Force | before artificial weathering		15.20
Pile yarn 1 | Peak Breakage Force | after artificial weathering		15
Pile yarn 1 | Peak Breakage Force | Green Reference value before artificial weathering		15.20
Pile yarn 1 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	1.00
Pile yarn 2 | Peak Breakage Force | before artificial weathering		15.20
Pile yarn 2 | Peak Breakage Force | after artificial weathering		15,3
Pile yarn 2| Peak Breakage Force | Green Reference value before artificial weathering		15.20
Pile yarn 2 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	1.00
Pile yarn 3 | Peak Breakage Force | before artificial weathering		53.90
Pile yarn 3 | Peak Breakage Force | after artificial weathering		45,0
Pile yarn 3| Peak Breakage Force | Green Reference value before artificial weathering		53.90

Name	Comment	Result
Pile yarn 3 | Peak Breakage Force | Variation after weathering from Green Reference value	Change ≤ 25 %	16.51
Polymeric infill | Colour change | after artificial weathering	≥ Grey scale 3	5
Polymeric infill | Visual change in composition | after artificial weathering	No change	No change
Complete system | Water permeability	> 180 mm/h	3582
Stitched joints | Strength | un-aged	≥ 1000N/100mm	0
Stitched joints | Strength | water aged	≥ 1000N/100mm	0
Bonded joints | Strength | un-aged	≥ 75/100mm	100
Bonded joints | Strength | water aged	≥ 75/100mm	93
Carpet tuft | Withdrawal force | un-aged	≥ 40N	48
Carpet tuft | Withdrawal force | water aged	≥ 40N	42
Heat | Category	for information	Category 3
7 - Miscellaneous (shock pad, sub-base - if part of the system)		
Shock Pad / E-layer | tensile strength | un-aged	≥ 0.15 MPa	0.00
Sub-base | Composition		-
Sub-base | Particle size range		-
Sub-base | Particle shape		-
Sub-base | Thickness		-
Sub-base | Compaction & test method		-

Name	Comment	Result
Other, detail		-
Turf | Product Report Details		
Shockpad, E-layer | Type Category		No Shockpad
Performance Infill | Material type Category		End of Life Tires Infill (ELT)
Splash | Characteristics Category		≥ 1.5%

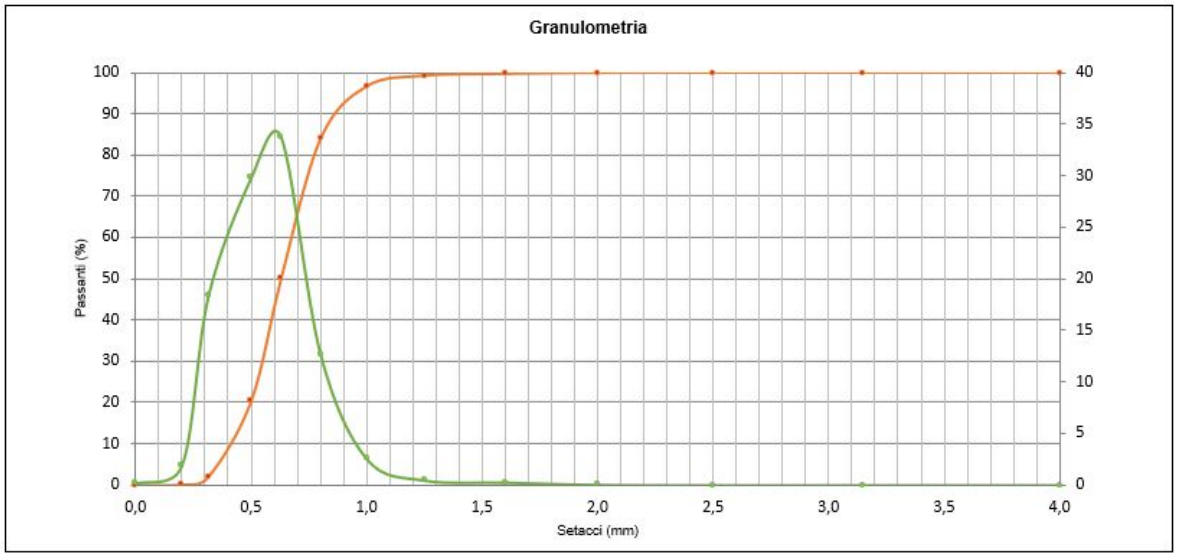
2 – Test Images

Performance infill particle grading curve



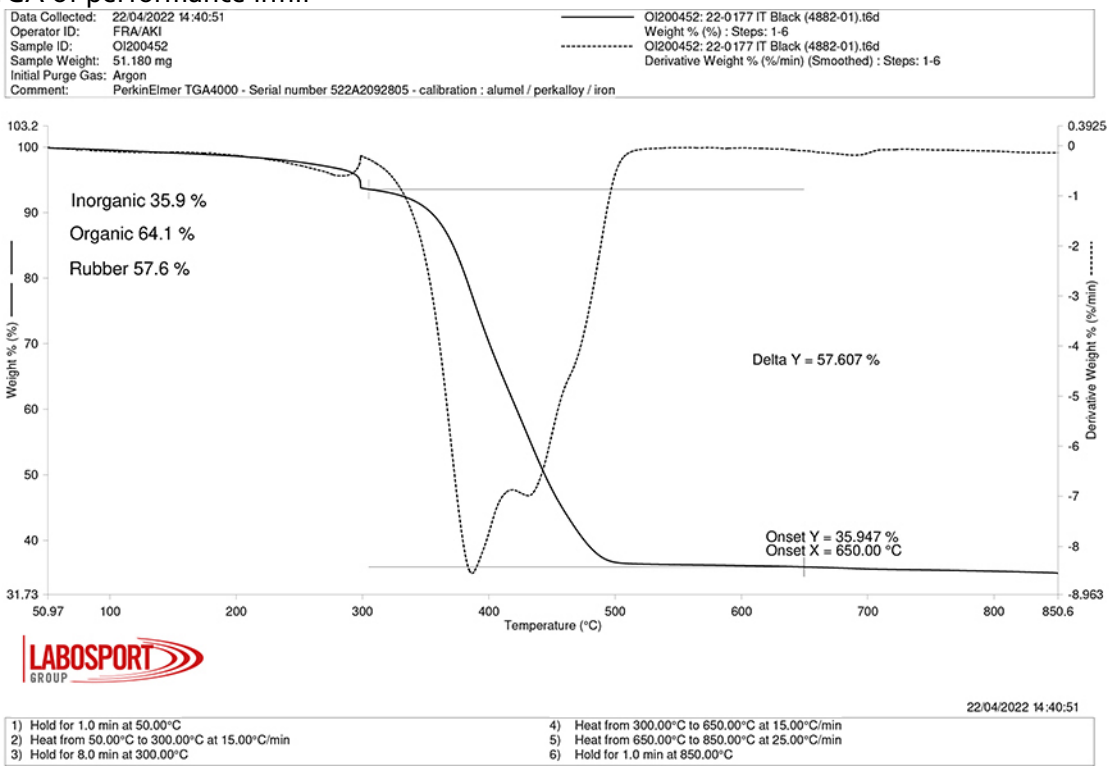
Setacci (mm)	0	0,2	0,315	0,5	0,63	0,8	1,0	1,25	1,6	2,0	2,5	3,15	4,0
Rifiutati (%)	0	0	0	0	0	2	3	13	21	27	28	5	0
Passanti (%)	0	0	0	0	0	1	2	5	18	39	67	94	100

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 (%)	0	2	18	30	34	13	3	0	0	0	0	0	0
Passanti (%)	0	0	2	20	50	84	97	99	100	100	100	100	100

TGA of performance infill



Simulated wear - Before 1

Simulated wear - Before 2

Simulated wear - Before 3

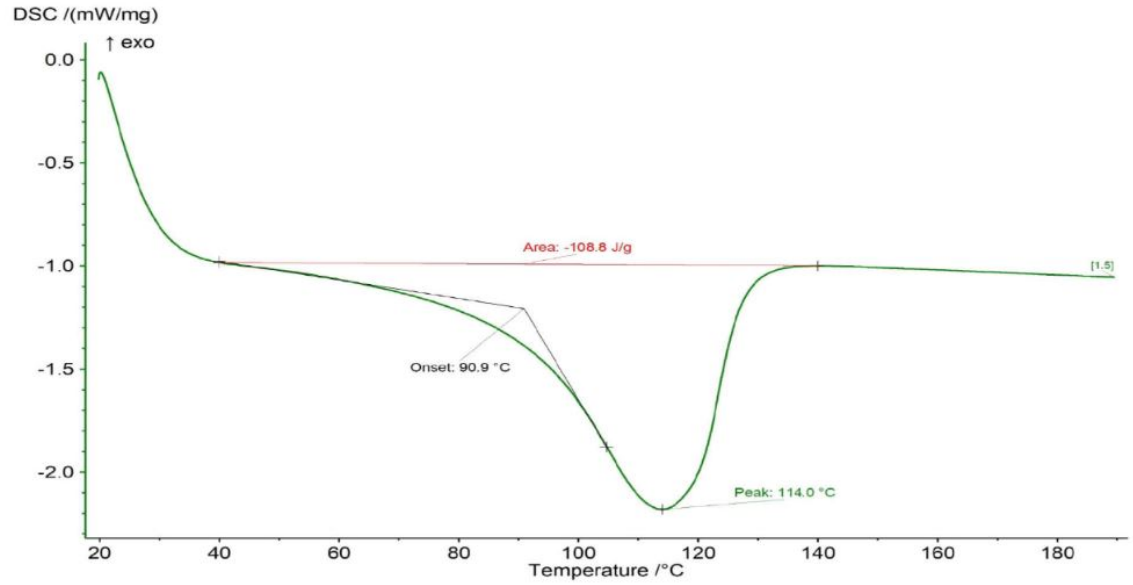
Simulated wear - Before 4

Simulated wear - After 1

Simulated wear - After 2

Yarn Characteristics DSC

Laboratory:	Labosport Italia Srl	**Identity:**	22-0177IT
Project:	22-0177IT	**Sample:**	VS
Operator:	Matteo	**Sample mass:**	6.54 mg
Date/Time:	13/04/2022 05:24:55	**Serial number**	DSC3500A-1254-L



TEST CYCLES:
1) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min
2) Hold for 5,0 min at 190,0 °C
3) Cool from 190 °C to 20,0 °C at 20,0 °C/min
4) Hold for 5,0 min at 20,0 °
5) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min

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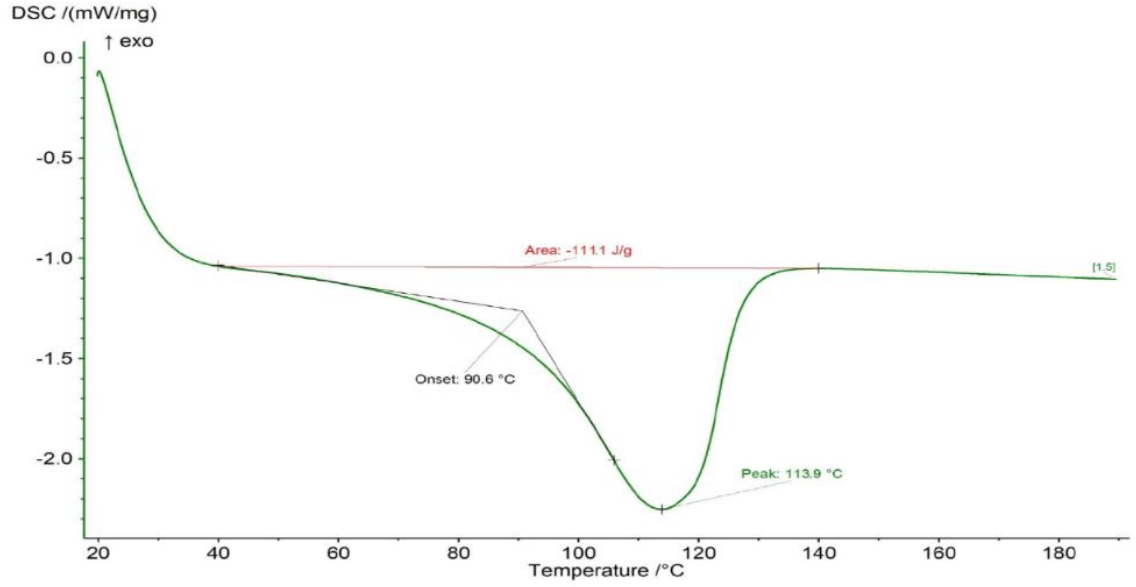
Yarn Characteristics DSC - 2

Laboratory:	Labosport Italia Srl	**Identity:**	22-0177IT
Project:	22-0177IT	**Sample:**	VC
Operator:	Matteo	**Sample mass:**	6.55 mg
Date/Time:	13/04/2022 04:38:09	**Serial number**	DSC3500A-1254-L



TEST CYCLES:

1) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min
2) Hold for 5,0 min at 190,0 °C
3) Cool from 190 °C to 20,0 °C at 20,0 °C/min
4) Hold for 5,0 min at 20,0 °
5) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min

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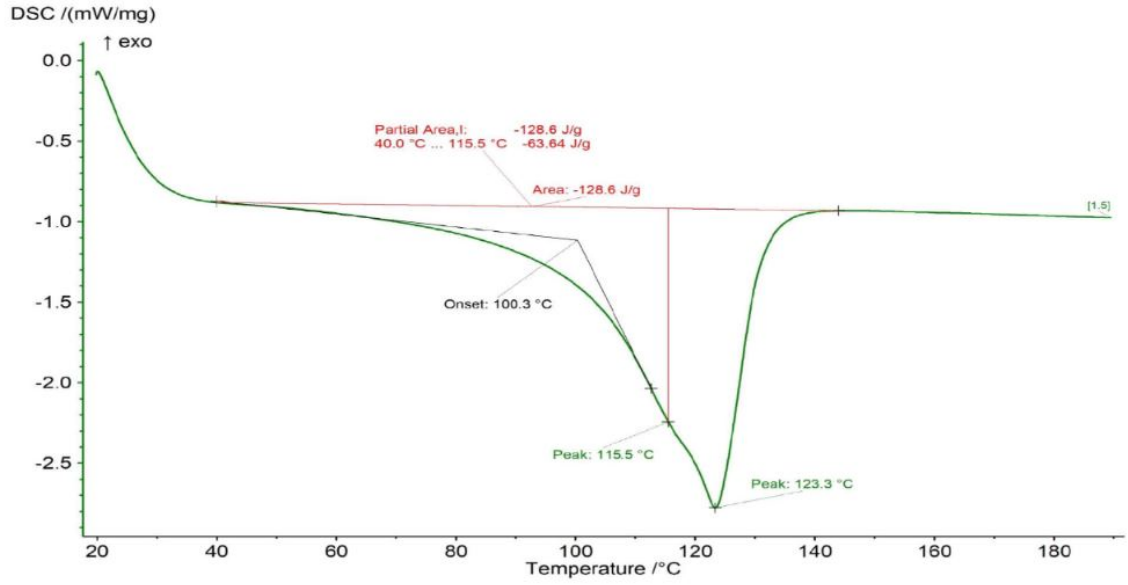
Yarn Characteristics DSC - 3

Laboratory:	Labosport Italia Srl	**Identity:**	22-0177IT
Project:	22-0177IT	**Sample:**	V FIBRILLATO
Operator:	Matteo	**Sample mass:**	6.59 mg
Date/Time:	13/04/2022 03:51:23	**Serial number**	DSC3500A-1254-L



TEST CYCLES:

1) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min
2) Hold for 5,0 min at 190,0 °C
3) Cool from 190 °C to 20,0 °C at 20,0 °C/min
4) Hold for 5,0 min at 20,0 °
5) Heat from 20,0 °C to 190,0 °C at 20,0 °C/min

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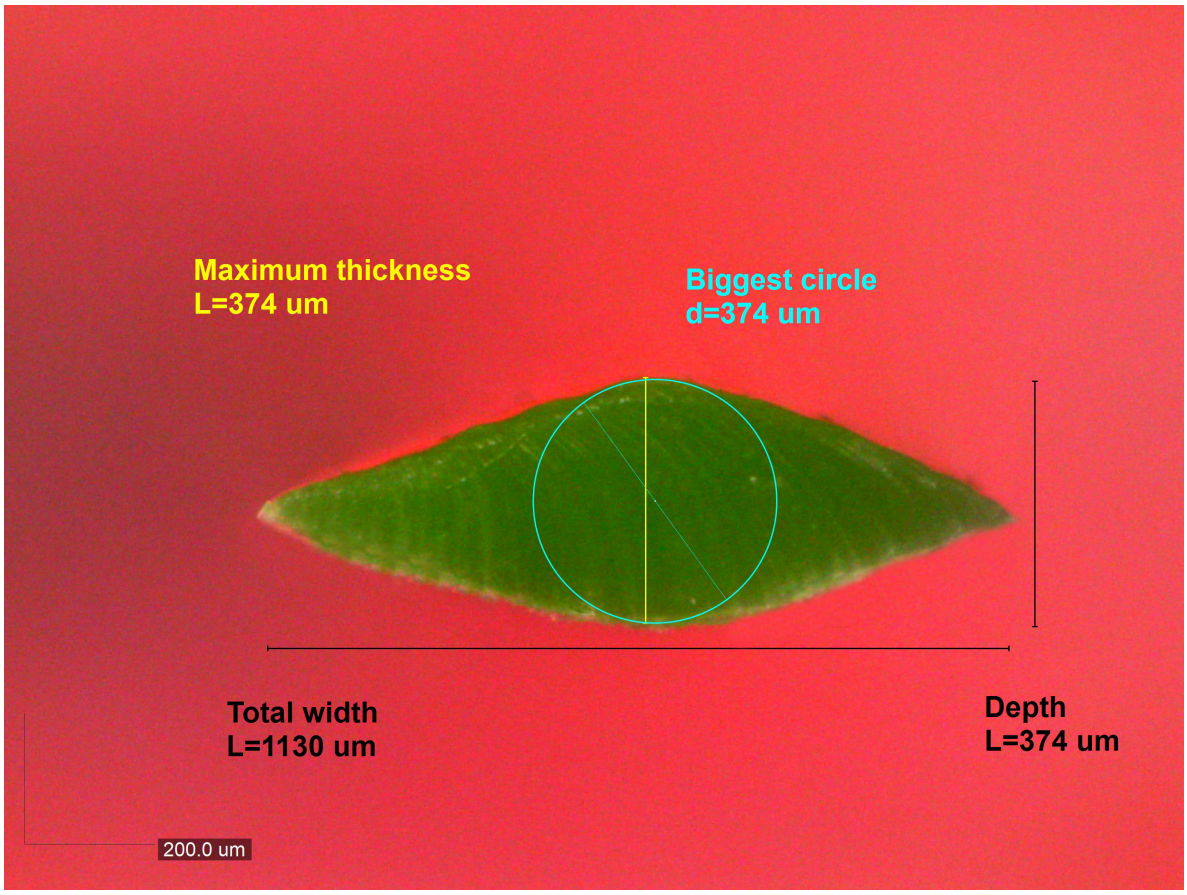
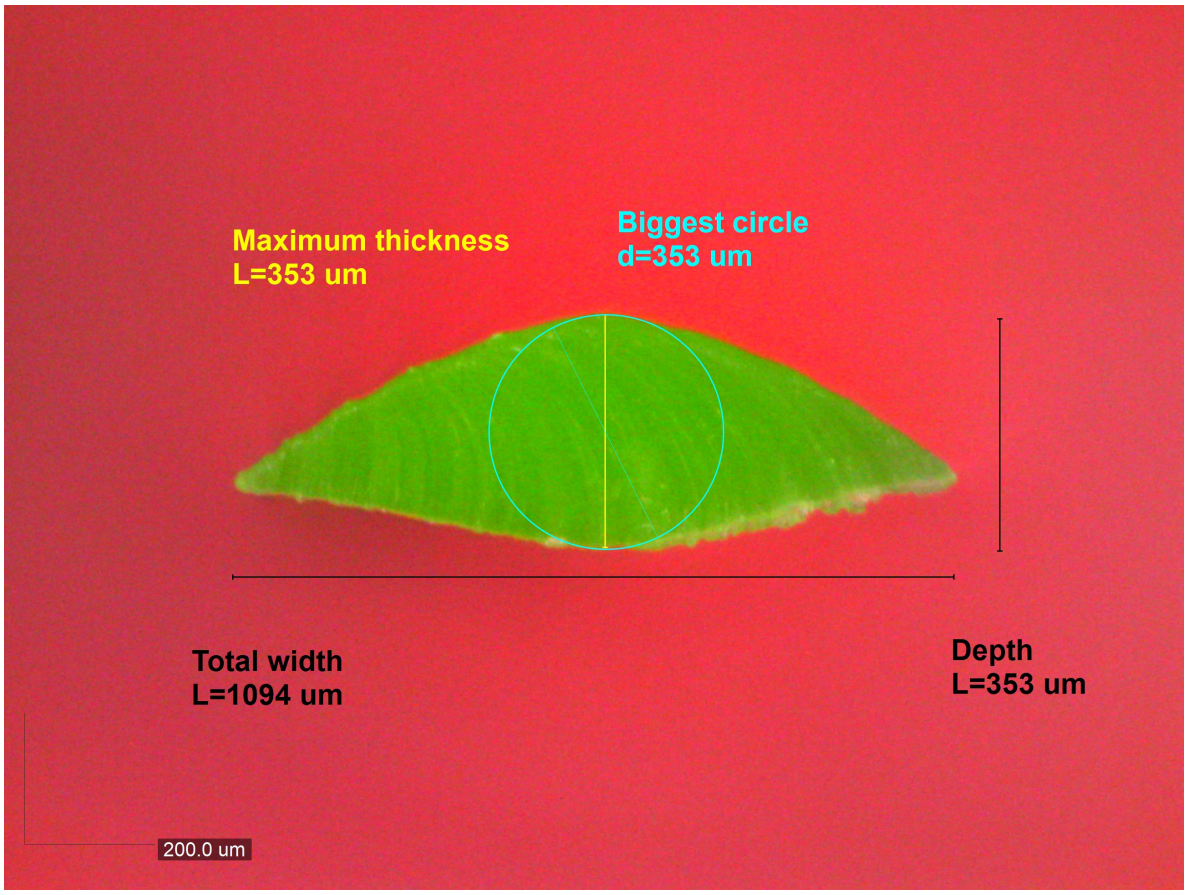
Stabilising Infill - picture

Performance Infill - picture

Cross-section Yarn 1



Cross-section Yarn 2



Cross-section Yarn 3