



FIFA LABORATORY TEST REPORT

TM Football Turf | 2015
01.01.2015

Product	XWR
FIFA Licensee	Nurteks Hali San.ve Tic. A.S.
Test Institute	Labosport Italia S.r.l.
Test Number	103187
External Test Number	21-0030IT
Date of Test	26.02.2021
Test Result	Passed
Quality Level	FIFA 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 Blokleri 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	25.03.2021

Test Institute Engineer	Matteo Giorgini
Signature	
Date	25.03.2021



1 – Test Results

Name	Comment	Result
1 - Summary		
Vertical ball rebound FIFA Quality Pro		Passed
Angle ball rebound FIFA Quality Pro		Passed
Reduced ball roll FIFA Quality Pro		Passed
Shock absorption FIFA Quality Pro		Passed
Deformation FIFA Quality Pro		Passed
Rotational resistance FIFA Quality Pro		Passed
Skin / surface friction		Passed
Skin abrasion		Passed
1 - Test Details Object		
Product Name		XWR
Product ID		-
Synthetic Turf System		-
Performance infill		SBR
Stabilising infill		SILICA
Shock-pad or elastic layer		FOAM
Sub-base composition		CONCRETE
2 - Test Details Test Institute		
Date(s) of test		26.02.2021
Report created by		Matteo Giorgini
Laboratory Test report number		21-0030IT
Test Institute Project number		21-0030IT
3 – Product Declaration (Manufacturer)		
Manufacturer		Nurteks Halı San. Tic. As.
Tuft pattern		Straight
Yarn manufacturer yarn 1		TenCate Thiolon B.V.
Product name, code yarn 1		MS D2 132/6 XWR FIELD GREEN, S17
Pile yarn profile yarn 1		Elipse
Pile thickness (µm) yarn 1		360.0
Pile colour (RAL) value 1 yarn 1		RAL 120 40 30



Name	Comment	Result
Pile colour (RAL) value 2 yarn 1		-
Pile colour (RAL) value 3 yarn 1		-
Pile width (mm) yarn 1		1.10
Number of tufts/m ² yarn 1	ISO1773	8260.00
Pile length (mm) yarn 1	ISO 2549	42.00
Pile weight (g/m ²) yarn 1	ISO 8543	555.00
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 132/6 XWR LIME GREEN, S18
Pile yarn profile yarn 2		Elipse
Pile thickness (µm) 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
Number of tufts/m ² yarn 2	ISO1773	8260.00
Pile length (mm) yarn 2	ISO 2549	42.00
Pile weight (g/m ²) yarn 2	ISO 8543	555.00
Pile yarn characterization yarn 2		PE
Pile yarn dtex yarn 2		7000.0
Yarn manufacturer yarn 3		-
Product name, code yarn 3		-
Pile yarn profile yarn 3		-



Name	Comment	Result
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		0
Pile yarn dtex yarn 3		0.0
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 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]		2570.0
Method of jointing		Bonded
Bonded joints Adhesive brand name		Ayka Floor



Name	Comment	Result
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 Tekstil
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		NRT SBR RUBBER
Performance Infill Manufacturer		NURTEKS HALI SAN. TİC.AS.
Performance Infill Material type		BLACK SBR
Performance Infill Material grading		1,0-3,15
Performance Infill Particle shape	prEN 14955	A2-B3
Performance Infill Particle size range	EN 933-Part 1	1,0-3,15
Performance Infill Bulk density (g/cm ³)	EN 1097-3	0.450
Performance Infill Application rate (kg/m ²)		10.5
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



Name	Comment	Result
Stabilising Infill Particle size range	EN 933-Part 1	0,315-0,8
Stabilising Infill Bulk density (g/cm ³)	EN 1097-3	1.50
Stabilising Infill Application rate (kg/m ²)		10.0
Shockpad, E-layer Product name, code		Foamex Shock Pad
Shockpad, E-layer Manufacturer		Berkosan
Shockpad, E-layer Type		Foam
Shockpad, E-layer Composition		-
Shockpad, E-layer Bulk density (g/cm ³)		40.00
Shockpad, E-layer Thickness	EN 1969	8.8
Shockpad, E-layer Shock absorption (%)	FIFA 4a	24.8
Shockpad, E-layer Deformation	FIFA 5a	5.8
Shockpad, E-layer Tensile strength (MPa)		0.17
Shockpad, E-layer Mass per unit area (kg/m ²)		0.0
Other, detail		-
3 – Test Results Player / Surface Interaction		
Rotational Resistance Initial Dry (Pro)	32 - 43 Nm	41
Rotational Resistance Initial Wet (Pro)	32 - 43 Nm	38
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
3 – Test Results Product identification field product		
Performance infill Thermographic analysis Elastomer [%] -		58.7



Name	Comment	Result
Product Declaration		
Performance infill Thermographic analysis Inorganic [%] - Product Declaration		35.2
Performance infill Thermographic analysis Organic [%] - Product Declaration		64.8
4 – Product Identification		
Artificial Turf Carpet mass per unit area [g/m ²]		2567
Artificial Turf Tufts per unit area [m ²]		9072
Artificial Turf Pile length above backing [mm]		42.0
Artificial Turf Pile weight [g/m ²]		1125
Detailed tuft decitex (Dtex) [g/1000m]		13694
Artificial Turf Water permeability of carpet [mm/h]		5625
Artificial Turf Free pile height		11
Performance infill Particle size range [mm]		0,8 - 3,15
Performance infill Particle shape		A2 - B3
Performance infill Bulk density [g/cm ³]		0.470
Performance infill Infill depth [mm]		29
Performance infill Thermographic analysis organic [%]		62
Performance infill Thermographic analysis inorganic [%]		38



Name	Comment	Result
Stabilising infill Particle size range [mm]		0,5 - 1,0
Stabilising infill Particle shape		C2
Stabilising infill Bulk density [g/cm ³]		1.36
Shock pad / E-layer Shock absorption [%]	if part of supplied system	24.8
Shock pad / E-layer Deformation	if part of supplied system	5.8
Shock pad / E-layer Thickness	if part of supplied system	8.8
Other, detail		-
5 – Test Results Ball / Surface interaction		
Vertical Ball Rebound Initial Dry (Pro)	0.6 - 0.85m	0.79
Vertical Ball Rebound Initial Wet (Pro)	0.6 - 0.85m	0.75
Vertical Ball Rebound after simulated wear 3'000 cycles (5*)	0.6 - 0.85m	0.85
Vertical Ball Rebound after simulated wear 3'000 cycles (20*)	0.6 - 0.85m	0.00
Angle Ball Rebound Dry	45 - 60 %	55
Angle Ball Rebound Wet	45 - 80 %	65
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	7.5
Reduced Ball Roll after simulated wear 3'000 cycles (5*) Wet	4 - 8 m	7.7
Reduced Ball Roll after simulated wear 3'000 cycles (20*) Dry	4 - 8 m	0.0
Reduced Ball Roll after simulated	4 - 8 m	0.0



Name	Comment	Result
wear 3'000 cycles (20*) Wet		
Shock absorption Initial Dry (Pro)	62 - 68 %	64.9
Shock absorption Initial Wet (Pro)	62 - 68 %	64.5
Shock absorption after simulated wear 3'000 cycles (5*)	62 - 68 %	62.6
Shock absorption after simulated wear 3'000 cycles (20*)	62 - 68 %	0.0
Shock absorption 50°C	57 - 68 %	66.20
Shock absorption -5°C	57 - 68 %	66.90
Other, detail		-
5 – Test Results Player / Surface interaction		
Deformation Initial Dry (Pro)	4 - 10 mm	10.0
Deformation Initial Wet (Pro)	4 - 10 mm	10.0
Deformation after simulated wear 3'000 cycles (5*)	4 - 10 mm	9.5
Deformation after simulated wear 3'000 cycles (20*)	4 - 10 mm	0.0
Skin / surface friction Dry	0.35 - 0.75 μ	0.60
Skin / surface friction Dry 3'000 cycles	0.35 - 0.75 μ	0.68
Skin / surface friction Dry 6'000 cycles	0.35 - 0.75 μ	0.00
Skin abrasion Dry	\pm 30 %	17
Skin abrasion Dry 3'000 cycles	\pm 30 %	26
Skin abrasion Dry 6'000 cycles	\pm 30 %	0
6 – Environmental impact (artificial, light, water)		
Pile yarn 1 Colour change after artificial weathering	\geq Grey scale 3	5
Pile yarn 2 Colour change	\geq Grey scale 3	5



Name	Comment	Result
after artificial weathering		
Pile yarn 3 Colour change after artificial weathering	≥ Grey scale 3	0
Pile yarn 1 Peak Breakage Force before artificial weathering		15.20
Pile yarn 1 Peak Breakage Force after artificial weathering		15,1
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 %	0.70
Pile yarn 2 Peak Breakage Force before artificial weathering		13.60
Pile yarn 2 Peak Breakage Force after artificial weathering		14,3
Pile yarn 2 Peak Breakage Force Green Reference value before artificial weathering		13.60
Pile yarn 2 Peak Breakage Force Variation after weathering from Green Reference value	Change ≤ 25 %	5.10
Pile yarn 3 Peak Breakage Force before artificial weathering		0.00
Pile yarn 3 Peak Breakage Force after artificial weathering		-



Name	Comment	Result
Pile yarn 3 Peak Breakage Force Green Reference value before artificial weathering		0.00
Pile yarn 3 Peak Breakage Force Variation after weathering from Green Reference value	Change \leq 25 %	0.00
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	3843
Stitched joints Strength un-aged	\geq 1000N/100mm	0
Stitched joints Strength water aged	\geq 1000N/100mm	0
Bonded joints Strength un-aged	\geq 75/100mm	100
Bonded joints Strength water aged	\geq 75/100mm	93
Carpet tuft Withdrawal force un-aged	\geq 40N	63
Carpet tuft Withdrawal force water aged	\geq 40N	52
Heat Category	for information	Category 3
Splash Characteristics	for information	$>$ 1,5%
7 - Miscellaneous (shock pad, sub-base - if part of the system)		
Shock Pad / E-layer tensile strength un-aged	\geq 0.15 MPa	0.17
Sub-base Composition		-

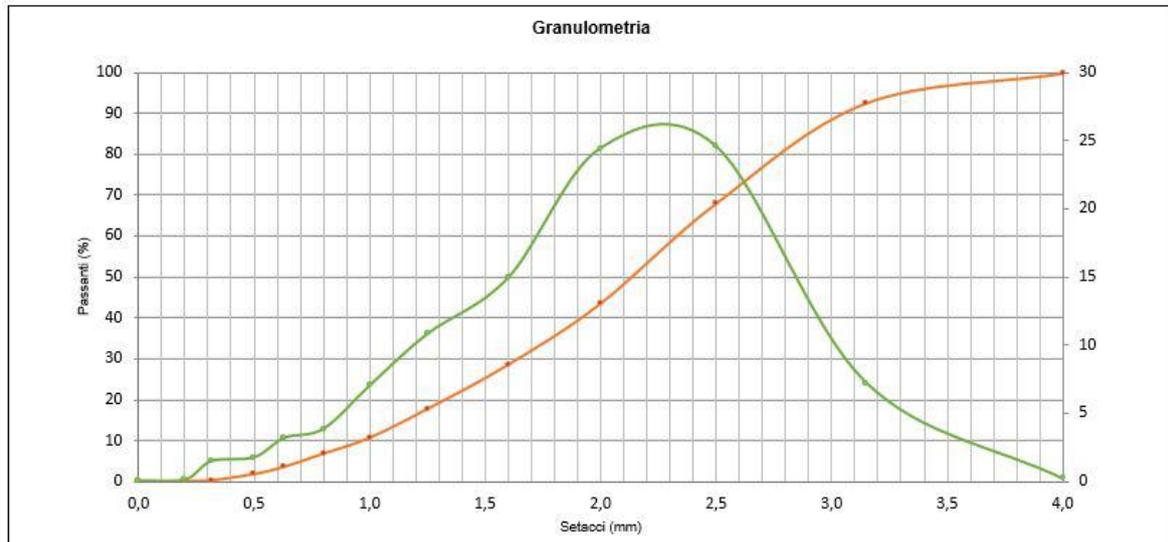


Name	Comment	Result
Sub-base Particle size range		-
Sub-base Particle shape		-
Sub-base Thickness		-
Sub-base Compaction & test method		-
Other, detail		<p>Due to different DSC devices and potential difference in the test method used, the shape and peak temperatures of the DSC analysis may differ from the FIFA requirement.</p> <p>MS D2 132/6 XWR FIELD GREEN, S17 UVA report SPORTSLABS number 16744/1375 issued on 07/07/2016.</p> <p>MS D2 132/6 XWR LIME GREEN, S18 UVA report SPORTSLABS number 16744/1798 issued on 07/07/2016.</p>



2 – Test Images

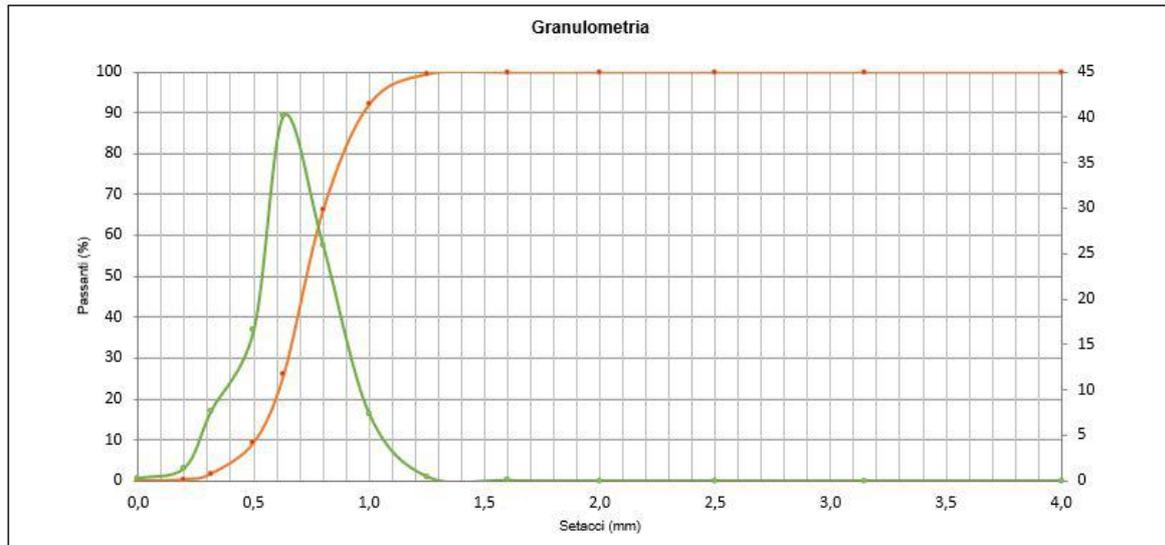
Performance infill particle grading curve



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	2	2	3	4	7	11	15	24	25	7	0
Passanti (%)	0	0	0	2	4	7	11	18	29	44	68	93	100



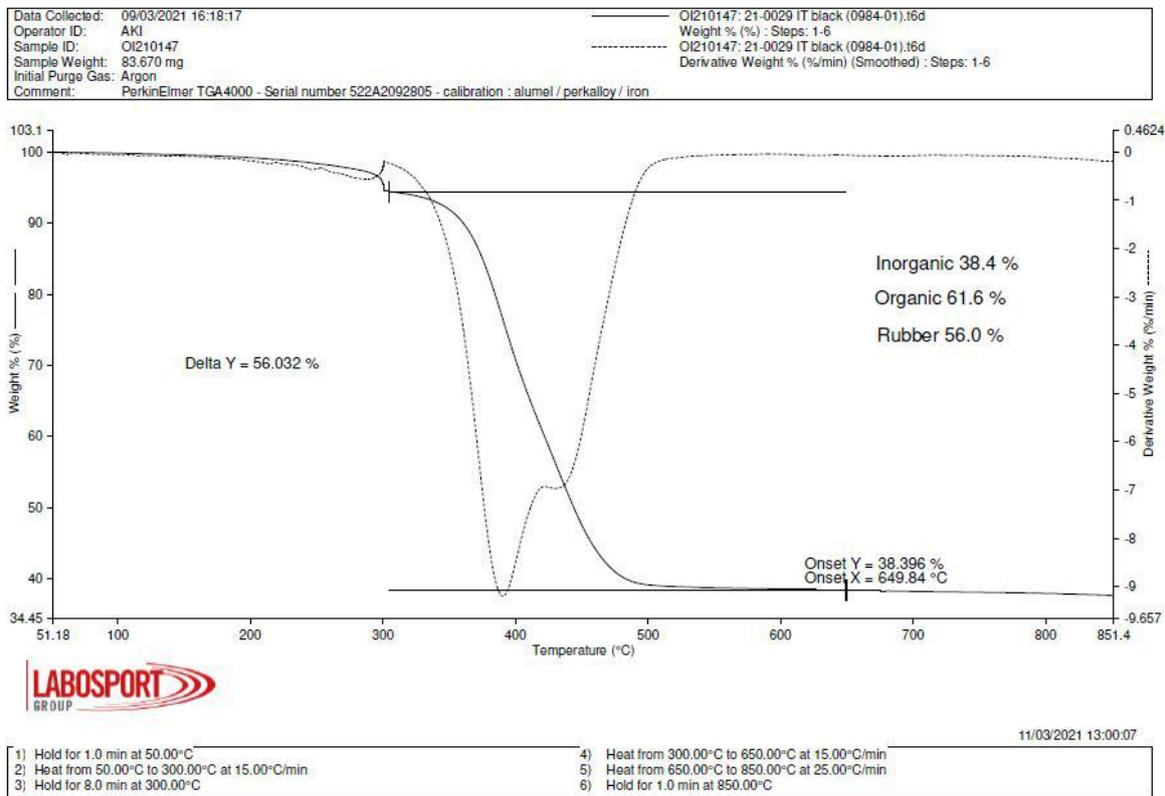
Stabilising infill particle grading curve



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	1	8	17	40	26	7	0	0	0	0	0	0
Passanti (%)	0	0	2	9	26	66	92	100	100	100	100	100	100



TGA of performance infill





Simulated wear - Before 1





Simulated wear - Before 2



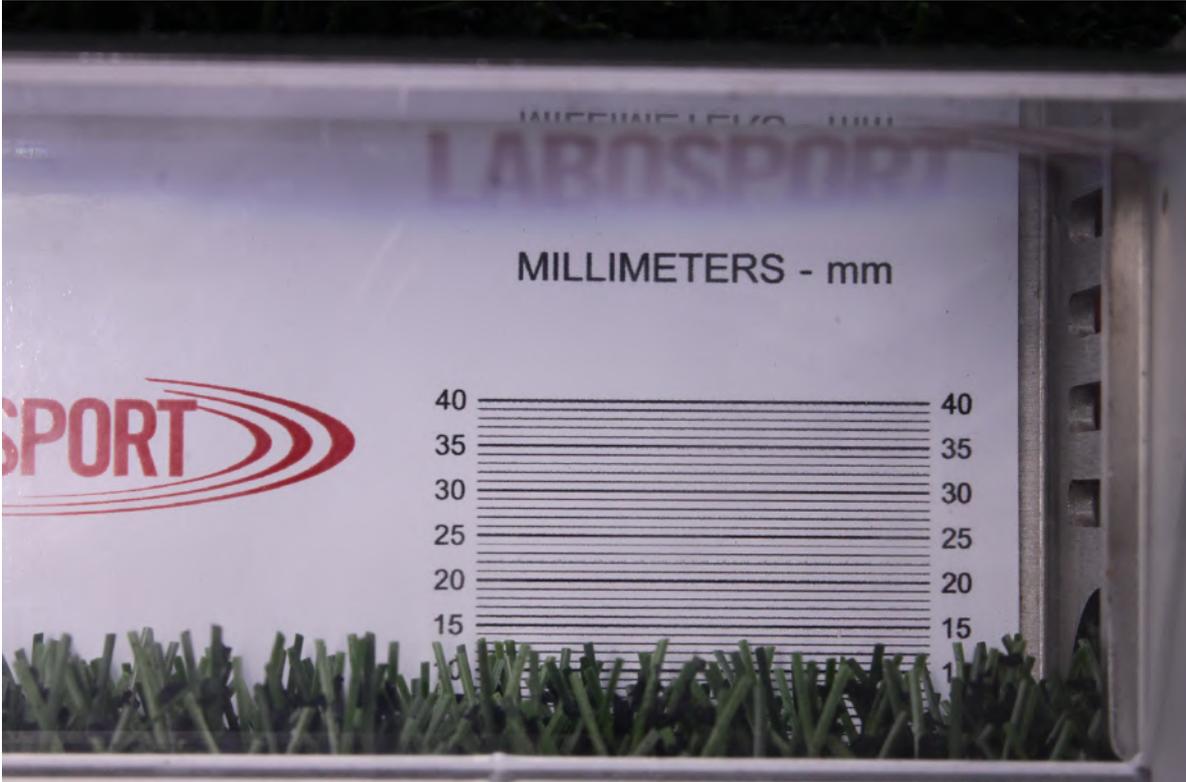


Simulated wear - After 1





Simulated wear - After 2

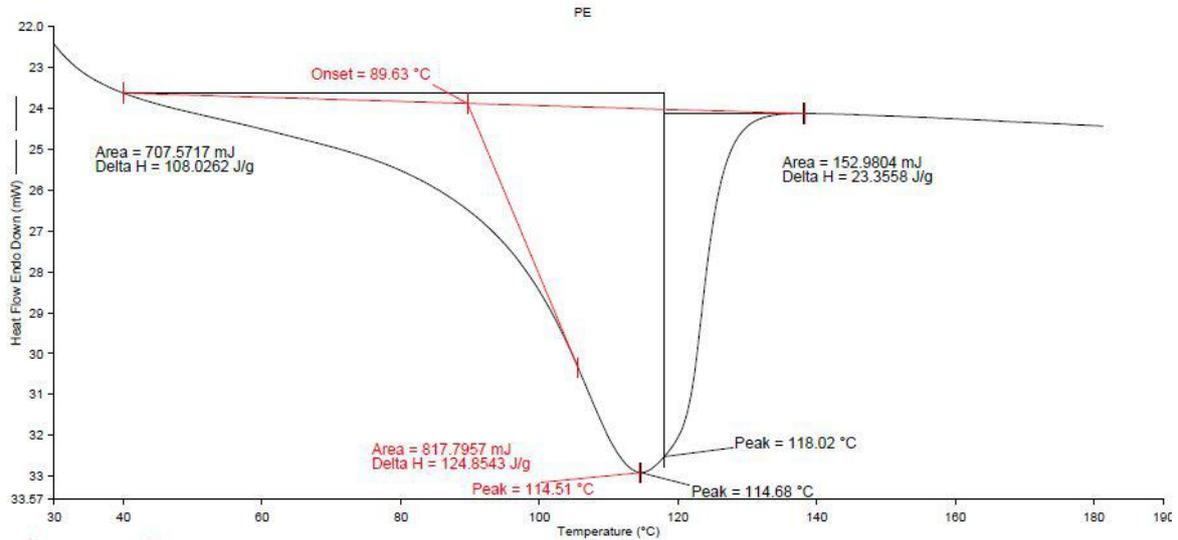




Yarn Characteristics DSC

Data Collected: 05/02/2021 11:08:13
 Operator ID: AKI
 Sample ID: OI210074
 Sample Weight: 6.550 mg
 Initial Purge Gas: Argon
 Comment: NF EN ISO 11357-3; Perkin Elmer Thermal Analysis DSC 4000 Serial Number : 520B19120202

OI210074: 21-0030 IT Light green (0490-02).d8d
 Unsubtracted Heat Flow Endo Down (mW) : Step: 5



12/02/2021 16:17:47

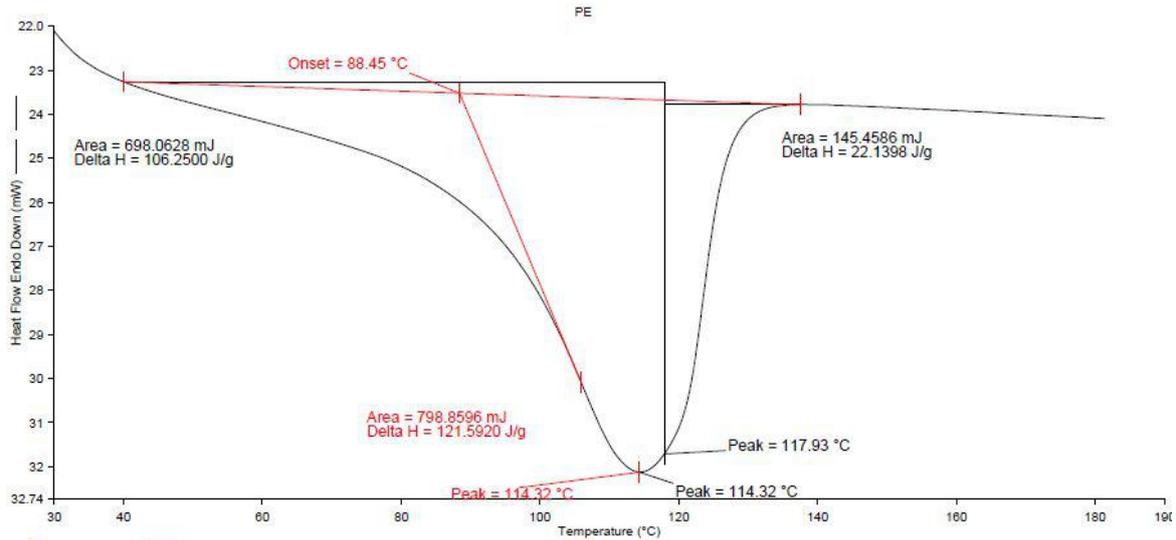
1) Heat from 20.00°C to 190.00°C at 20.00°C/min
 2) Hold for 5.0 min at 190.00°C
 3) Cool from 190.00°C to 20.00°C at 20.00°C/min
 4) Hold for 5.0 min at 20.00°C
 5) Heat from 20.00°C to 190.00°C at 20.00°C/min



Yarn Characteristics DSC - 2

Data Collected: 05/02/2021 10:16:58
 Operator ID: AKI
 Sample ID: OI210074
 Sample Weight: 6.570 mg
 Initial Purge Gas: Argon
 Comment: NF EN ISO 11357-3: Perkin Elmer Thermal Analysis DSC 4000 Serial Number : 520B19120202

OI210074: 21-0030 IT Dark green (0460-01).d6d
 Unsubtracted Heat Flow Endo Down (mW) : Step: 5



12/02/2021 16:21:28

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

Stabilising Infill - picture

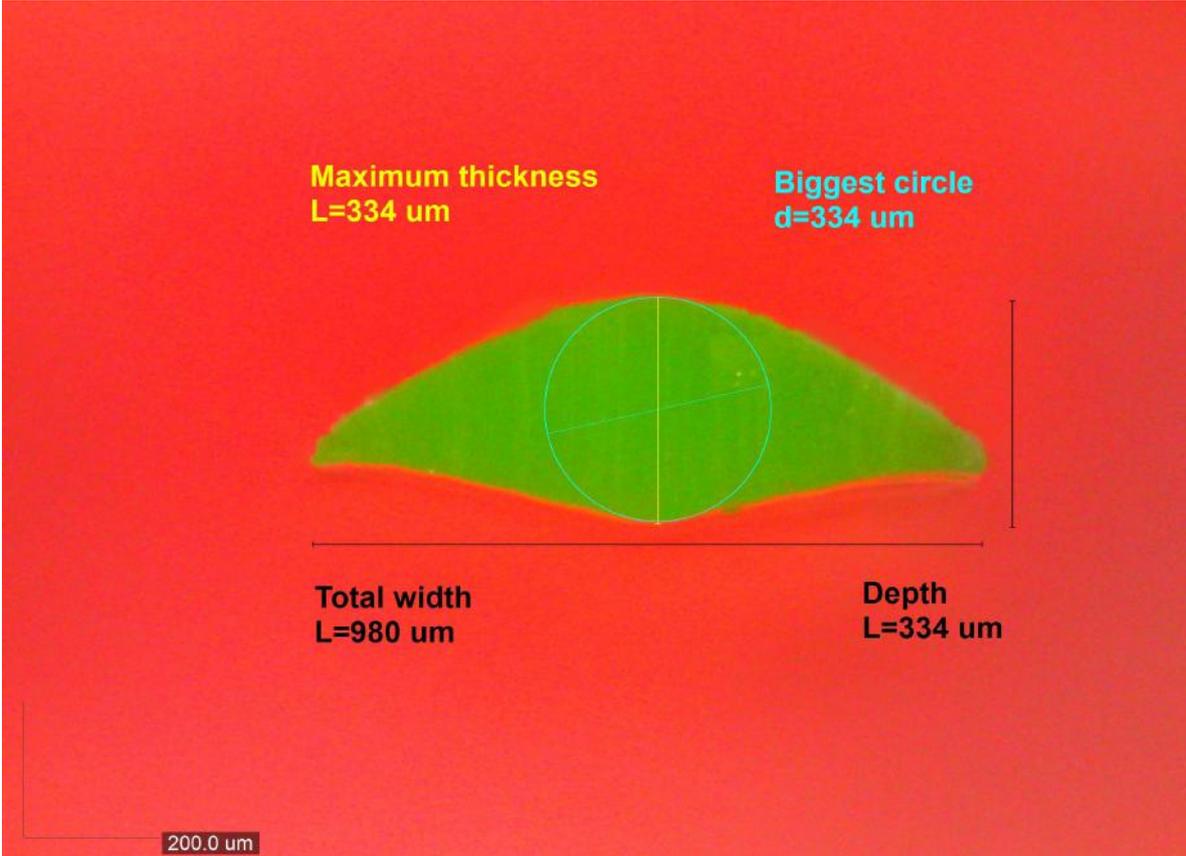


Performance Infill - picture





Cross-section Yarn 1





Cross-section Yarn 2

