

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 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

Approvai	
Test Institute Director	Roberto Armeni
Signature	Derleur
Date	25.03.2021
Total Institute Fusioness	NA 11 6:
Test Institute Engineer	Matteo Giorgini
Signature	Makelyer
Date	25.03.2021



1 – Test Results

I – Test Results		
Name	Comment	Result
1 - Summary		
Vertical ball		, , , , , , , , , , , , , , , , , , ,
rebound FIFA		Passed
Quality Pro		
Angle ball		, , , , , , , , , , , , , , , , , , ,
rebound FIFA		Passed
Quality Pro		
Reduced ball roll		Passed
FIFA Quality Pro		
Shock absorption		Passed
FIFA Quality Pro		
Deformation FIFA		Passed
Quality Pro		
Rotational		
resistance FIFA		Passed
Quality Pro		
Skin / surface		Passed
friction		
Skin abrasion		Passed
1 - Test Details Object		1,000
Product Name		XWR
Product ID		-
Synthetic Turf		_
System		
Performance infill		SBR
Stabilising infill		SILICA
Shock-pad or		FOAM
elastic layer		1 07 (17)
Sub-base		CONCRETE
composition		CONCINETE
2 - Test Details Test Insti	tute	
Date(s) of test		26.02.2021
Report created by		Matteo Giorgini
Laboratory Test		21-0030IT
report number		21 003011
Test Institute		21-0030IT
Project number		21 003011
3 - Product Declaration (Manufacturer)	
Manufacturer		Nurteks Halı San. Tic. As.
Tuft pattern		Straight
Yarn		
manufacturer		TenCate Thiolon B.V.
yarn 1		
Product name,		MS D2 132/6 XWR FIELD
code yarn 1		GREEN, S17
Pile yarn profile		Elipse
yarn 1		Liipse
Pile thickness (µ		360.0
m) yarn 1		300.0
Pile colour (RAL)		RAL 120 40 30
value 1 yarn 1		IAL 120 40 30



Pile colour (RAL) value 2 yarn 1 Pile colour (RAL) value 3 yarn 1 Pile width (mm) yarn 1 1.10	Name	Comment	Result
value 2 yarn 1 Pile colour (RAL) value 3 yarn 1 Pile width (mm) yarn 1 Number of tufts/m2 yarn 1 ISO 2549 42.00 yarn 1 Pile length (mm) yarn 1 ISO 2549 42.00 yarn 1 Pile length (g/m2) yarn 1 Pile weight (g/m2) yarn 1 Pile yarn dtax yarn 1 Pile yarn dtax yarn 1 Yarn 2 Pile yarn profile 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 colour (RAL) value 3 yarn 2 Pile colour (RAL) value 3 yarn 2 Pile width (mm) yarn 2 Pile colour (RAL) value 2 yarn 2 Pile width (mm) yarn 2 Pile length (mm) yarn 2 Pile length (mm) yarn 2 Pile wight (g/m2) Jos 2549 42.00 Pile wight (g/m2) Jyarn 2 Pile yarn dtax yarn 2 Yarn manufacturer yarn 3 Pare Yarn		Comment	Result
Pile colour (RAL) value 3 yarn 1			-
Value 3 yarn 1			
Pile width (mm) yarn 1			-
yarn 1			
Number of tufts/m2 yarn 1			1.10
tufts/m2 yarn 1 ISO1//3 S260.00 Pile length (mm) yarn 1 Pile weight (g/m2) yarn 1 Pile weight (g/m2) yarn 1 Pile yarn dexelia yarn 1 Pile yarn dexelia yarn 1 Pile yarn dexelia yarn 1 Yarn TenCate Thiolon B.V yarn 2 Product name, code yarn 2 Pile yarn profile 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 Pile length (mm) yarn 2 Pile length (mm) yarn 2 Pile length (mm) yarn 2 Pile weight (g/m2) yarn 2 Pile weight (g/m2) yarn 2 Pile yarn characterization yarn 2 Pile yarn dexelia yarn 3 Pile yarn dexelia yarn 4 Pile yarn dexelia yarn 4 Pile			
Pile length (mm) yarn 1		ISO1773	8260.00
yarn 1			
Sample S		ISO 2549	42.00
Jyarn 1			
Jyarn Pile yarn PE PE PE PE PE PE PE P		ISO 8543	555 00
Characterization yarn 1		.50 05 .5	333.00
yarn 1			
Pile yarn dtex yarn 1	characterization		PE
yarn 1 Yarn manufacturer yarn 2 Product name, code yarn 2 Pile yarn profile yarn 2 Pile colour (RAL) value 2 yarn 2 Pile colour (RAL) value 3 yarn 2 Pile width (mm) yarn 2 Pile length (mm) yarn 2 Pile weight (g/m2) yarn 2 Pile yarn 2 Pile yarn 2 Pile warn 2 Pile warn 3 Pile name for turts/m2 yarn 2 Pile weight (g/m2) yarn 2 Pile yarn 2 Pile warn 3 Pile yarn 4 Pile yarn 6 Pile yarn 7 Pile warn 9 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 1 Pile yarn 1 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 2 Pile yarn 1 Pile yarn 1 Pile yarn 2 Pile yarn 2 Pile yarn 2 Pile yarn 3			
yarn 1	Pile yarn dtex		7000
manufacturer yarn 2	yarn 1		7000
yarn 2	Yarn		
yarn 2	manufacturer		TenCate Thiolon B.V
Product name, code yarn 2			
Code yarn 2	-		MS D2 132/6 XWR LIME
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 Number of tufts/m2 yarn 2 ISO 1773 8260.00 Pile length (mm) yarn 2 ISO 2549 42.00 Pile weight (g/m2) yarn 2 ISO 8543 555.00 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -	•		
yarn 2			
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m) yarn 2 Pile colour (RAL)			
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/m2 yarn 2 ISO 1773 8260.00 Pile length (mm) yarn 2 ISO 2549 42.00 Pile weight (g/m2) yarn 2 ISO 8543 555.00 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -	-		360.0
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/m2 yarn 2 ISO 1773 8260.00 Pile length (mm) yarn 2 ISO 2549 42.00 Pile weight (g/m2) yarn 2 ISO 8543 555.00 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -			
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value 2 yarn 2 - Pile colour (RAL) - value 3 yarn 2 - Pile width (mm) 1.10 yarn 2 ISO1773 Number of tufts/m2 yarn 2 ISO 2549 Pile length (mm) yarn 2 ISO 2549 Pile weight (g/m2) yarn 2 ISO 8543 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -			
Pile colour (RAL) - value 3 yarn 2 - Pile width (mm) 1.10 yarn 2 ISO1773 Number of tufts/m2 yarn 2 ISO 2549 Pile length (mm) yarn 2 ISO 2549 Pile weight (g/m2) yarn 2 ISO 8543 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -			-
value 3 yarn 2 - Pile width (mm) yarn 2 1.10 Number of tufts/m2 yarn 2 ISO 1773 8260.00 Pile length (mm) yarn 2 ISO 2549 42.00 Pile weight (g/m2) yarn 2 ISO 8543 555.00 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -			
Pile width (mm) 1.10 Number of 1501773 8260.00 tufts/m2 yarn 2 ISO 2549 42.00 Pile length (mm) ISO 2549 42.00 Pile weight (g/m2) ISO 8543 555.00 Pile yarn 2 PE Pile yarn dtex 7000.0 Yarn manufacturer - yarn 3 -			-
yarn 2			
Number of tufts/m2 yarn 2 Pile length (mm) yarn 2 Pile weight (g/m2) ISO 2549 Pile yarn 2 Pile yarn characterization yarn 2 Pile yarn dtex yarn 2 Pile yarn dtex yarn 2 Yarn manufacturer yarn 3			1.10
tufts/m2 yarn 2			
Pile length (mm) yarn 2		ISO1773	8260.00
yarn 2 130 2349 42.00 Pile weight (g/m2) yarn 2 ISO 8543 555.00 Pile yarn characterization yarn 2 PE Pile yarn dtex yarn 2 7000.0 Yarn manufacturer yarn 3 -			
Pile weight (g/m2) yarn 2 Pile yarn 2 Pile yarn characterization PE yarn 2 Pile yarn dtex 7000.0 Yarn manufacturer - yarn 3		ISO 2549	42.00
yarn 2			
Pile yarn characterization PE yarn 2 Pile yarn dtex 7000.0 Yarn manufacturer - yarn 3		ISO 8543	555.00
characterization PE yarn 2 Pile yarn dtex 7000.0 Yarn manufacturer - yarn 3			
yarn 2 Pile yarn dtex 7000.0 Yarn 2 Yarn manufacturer - yarn 3			
Pile yarn dtex 7000.0 yarn 2 Yarn manufacturer - yarn 3			PE
yarn 2 Yarn manufacturer - yarn 3			
Yarn 2 Yarn manufacturer - yarn 3			7000 0
manufacturer - yarn 3			7000.0
yarn 3	Yarn		
yarn 3	manufacturer		-
Froduct name,	Product name,		
code yarn 3			-
Pile yarn profile			
yarn 3			-



	6	D If
Name	Comment	Result
Pile thickness (µ		0.0
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)		0.00
yarn 3		
Number of	ISO1773	0.00
tufts/m2 yarn 3		1000
Pile length (mm)	ISO 2549	0.00
yarn 3		5.55
Pile weight (g/m2)	ISO 8543	0.00
yarn 3		5.50
Pile yarn		
characterization		0
yarn 3		
Pile yarn dtex		0.0
yarn 3		0.0
Primary backing		
Product name,		H18
code		
Primary backing		Tencate
Manufacturer		Terreace
Re-enforcement		
scrim Product		-
name, code		
Re-enforcement		
scrim		-
Manufacturer		
Secondary		con
backing Product		SBR Latex
name, code		
Secondary		
backing		Styron
Manufacturer		
Secondary		
backing Dry		1100.0
application rate		
(g/m2)		
Carpet Minimum		40
tuft withdrawal		40
force (N)		
Carpet Carpet		2570.0
mass per unit area		2570.0
[g/m2]		
Method of		Bonded
jointing		
Bonded joints		Auto Flor:
Adhesive brand		Ayka Floor
name		



Name	Comment	Result
Bonded joints		
Adhesive		Ayka Floor
manufacturer		7.47.00.
Bonded joints		
Application rate		200
(g/m)		200
Bonded joints		
Jointing film		Helmetin
brand name		Heimeum
Bonded joints		
		Carta Taketil
Jointing film manufacturer		Serta Tekstil
Stitched seams		
Tread brand		_
name/product		
code		
Stitched seams		
Tread		-
manufacturer		
Stitched seams		
Stitch rate (stitch		0.000
per lm)		
Performance Infill		
Product name,		NRT SBR RUBBER
code		
Performance Infill		NURTEKS HALI SAN.
Manufacturer		TiC.AS.
Performance Infill		BLACK SBR
Material type		BEACK 3BK
Performance Infill		1,0-3,15
Material grading		1,0-5,15
Performance Infill	prEN 14955	A2-B3
Particle shape	pien 14933	A2-B3
Performance Infill		
Particle size	EN 933-Part 1	1,0-3,15
range		
Performance Infill		
Bulk density	EN 1097-3	0.450
(g/cm3)		
Performance Infill		
Application rate		10.5
(kg/m2)		
Stabilising Infill		
Product name,		Silica Sand
code		
Stabilising Infill		Frank Faure Vivin
Manufacturer		Emek, Fares Kum
Stabilising Infill		C:1:
Material type		Silica
Stabilising Infill		0.245.0.0
Material grading		0,315-0,8
Stabilising Infill	- N. 4	
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	EN 1097-3	1.50
(g/cm3)	211 1037 3	1.55
Stabilising Infill		
Application rate		10.0
(kg/m2)		10.0
Shockpad, E-layer		
Product name,		Foamex Shock Pad
code		Todifica Shock Fad
Shockpad, E-layer		
Manufacturer		Berkosan
Shockpad, E-layer		
Type		Foam
1 71		
Shockpad, E-layer		-
Charles de Filance		
Shockpad, E-layer		40.00
Bulk density		40.00
(g/cm3)		
Shockpad, E-layer	EN 1969	8.8
Thickness		
Shockpad, E-layer		
Shock absorption	FIFA 4a	24.8
(%)		
Shockpad, E-layer	FIFA 5a	5.8
Deformation	1117134	3.0
Shockpad, E-layer		
Tensile strength		0.17
(MPa)		
Shockpad, E-layer		
Mass per unit		0.0
area (kg/m2)		
Other, detail		-
3 – Test Results Player / 9	Surface Interaction	
Rotational		
Resistance Initial	32 - 43 Nm	41
Dry (Pro)		
Rotational		
Resistance Initial	32 - 43 Nm	38
Wet (Pro)		
Rotational		
Resistance after	22 42 N	42
simulated wear	32 - 43 Nm	43
3'000 cycles (5*)		
Rotational		
Resistance after	22 42 14	
simulated wear	32 - 43 Nm	0
3'000 cycles (20*)		
3 – Test Results Product	identification field prod	duct
Performance infill		
Theremographic		
analysis		58.7
Elastomer [%] -		
	II.	1



Name	Commont	Pogulé
Name Product	Comment	Result
Declaration		
Performance infill		
Theremographic		
analysis		35.2
Inorganic [%] -		
Product		
Declaration		
Performance infill		
Theremographic		64.0
analysis Organic		64.8
[%] - Product		
Declaration		
4 - Product Identification	<u>n</u>	
Artificial Turf		2567
Carpet mass per		2567
unit area [g/m2]		
Artificial Turf		
Tufts per unit		9072
area [m2]		
Artificial Turf		
Pile lenght above		42.0
backing [mm]		
Artificial Turf		1125
Pile weight [g/m2]		
Detailed tuft		
decitex (Dtex)		13694
[g/10000m]		
Artificial Turf		
Water		5625
permeability of		5525
carpet [mm/h]		
Artificial Turf		11
Free pile height		
Performance infill		
Particle size		0,8 - 3,15
range [mm]		
Performance infill		A2 - B3
Particle shape		, 12 55
Performance infill		
Bulk density		0.470
[g/cm3]		
Performance infill		29
Infill depth [mm]		
Performance infill		
Thermographic		62
analysis organic		
[%]		
Performance infill		
Theremographic		38
analysis		
inorganic [%]		



Name	Comment	Result
Stabilising infill	Comment	Result
		05 10
Particle size range		0,5 - 1,0
[mm]		
Stabilising infill		C2
Particle shape		
Stabilising infill		
Bulk density		1.36
[g/cm3]		
Shock pad / E-	if part of	
layer Shock	supplied	24.8
absorption [%]	system	
Shock pad / E-	if part of	
layer	supplied	5.8
Deformation	system	
	if part of	
Shock pad / E-	supplied	8.8
layer Thickness	system	
Other, detail	System	-
5 – Test Results Ball / Sui	face interaction	
Vertical Ball		
Rebound Initial	0.6 - 0.85m	0.79
	0.0 - 0.85111	0.79
Dry (Pro)		
Vertical Ball	0.6.005	0.75
Rebound Initial	0.6 - 0.85m	0.75
Wet (Pro)		
Vertical Ball		
Rebound after	0.6 - 0.85m	0.85
simulated wear	0.0 0.05	
3'000 cycles (5*)		
Vertical Ball		
Rebound after	0.6 - 0.85m	0.00
simulated wear	0.0 - 0.05111	0.00
3'000 cycles (20*)		
Angle Ball	45 60.0/	
Rebound Dry	45 - 60 %	55
Angle Ball	45 00 0/	65
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	4 - 8 m	7.5
(5*) Dry		
Reduced Ball Roll	+	
after simulated		
	4 - 8 m	7.7
wear 3'000 cycles		
(5*) Wet	-	
Reduced Ball Roll		
after simulated	4 - 8 m	0.0
wear 3'000 cycles		
(20*) Dry		
Reduced Ball Roll	4 - 8 m	0.0
after simulated	 	, v.v



Name	Comment	Result
	Comment	Result
wear 3'000 cycles		
(20*) Wet		
Shock absorption	62 - 68 %	64.9
Initial Dry (Pro)		
Shock absorption	62 - 68 %	64.5
Initial Wet (Pro)		
Shock absorption after simulated		
	62 - 68 %	62.6
wear 3'000 cycles (5*)		
Shock absorption		
after simulated		
	62 - 68 %	0.0
wear 3'000 cycles		
(20*)		
Shock absorption	57 - 68 %	66.20
Shock absorption -5°C	57 - 68 %	66.90
Other, detail		-
	/ Surface interaction	-
5 - Test Results Player	/ Surrace Interaction	
Deformation	4 - 10 mm	10.0
Initial Dry (Pro)		
Deformation	4 - 10 mm	10.0
Initial Wet (Pro)		
Deformation after simulated		
	4 - 10 mm	9.5
wear 3'000 cycles (5*)		
Deformation		
after simulated		
wear 3'000 cycles	4 - 10 mm	0.0
(20*)		
Skin / surface		
friction Dry	0.35 - 0.75 μ	0.60
Skin / surface		
friction Dry	0.35 - 0.75 μ	0.68
3'000 cycles	0.33 - 0.73 μ	0.06
Skin / surface		
friction Dry	0.35 - 0.75 μ	0.00
6'000 cycles	σ.55 σ.75 μ	0.00
Skin abrasion		
Dry	± 30 %	17
Skin abrasion		
Dry 3'000 cycles	± 30 %	26
Skin abrasion		
Dry 6'000 cycles	± 30 %	0
	act (arficial, light, water)	
Pile yarn 1		
Colour change		_
after artificial	≥ Grey scale 3	5
weathering		
Pile yarn 2	6 13	-
Colour change	≥ Grey scale 3	5
	i	<u> </u>



After artificial weathering Pile yarn 3 Colour change after artificial weathering Pile yarn 1 Peak Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60	
Weathering Pile yarn 3 Colour change after artificial weathering Pile yarn 1 Peak Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force User of the peak Breakage Force Variation after weathering Variation after weathering from Green Reference value Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 2 Peak Breakage Force before artificial Variation after Walue Pile yarn 3 Variation after Walue Pile yarn 4 Variation after Walue Pile yarn 5 Variation after Walue Pile yarn 6 Variation after Walue Pile yarn 7 Variation after Walue Pile yarn 9 Variation	
Pile yarn 3 Colour change after artificial weathering Pile yarn 1 Peak Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60	
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weathering Pile yarn 1 Peak Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering 15,1 weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60 13.60	
Pile yarn 1 Peak Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60	
Breakage Force before artificial weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20	
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Weathering Pile yarn 1 Peak Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60	
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Breakage Force after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 13.60	
after artificial weathering Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial	
Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 15.20 10.70 10.70 10.70 10.70	
Pile yarn 1 Peak Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 15.20 0.70 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20 15.20	
Breakage Force Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 15.20 0.70 13.60	
Green Reference value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 0.70 15.20	
value before artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial 15.20 0.70 0.70 13.60	
artificial weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial Change ≤ 25 % 0.70 13.60	
weathering Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial Change ≤ 25 % 0.70 13.60	
Pile yarn 1 Peak Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial Change ≤ 25 % 0.70 13.60	
Breakage Force Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial Change ≤ 25 % 0.70 13.60	
Variation after weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial Change ≤ 25 % 0.70 13.60	
weathering from Green Reference value Pile yarn 2 Peak Breakage Force before artificial	
Green Reference value Pile yarn 2 Peak Breakage Force 13.60	
value Pile yarn 2 Peak Breakage Force 13.60	
Pile yarn 2 Peak Breakage Force 13.60	
Breakage Force 13.60	
before artificial	
weathering	
Pile yarn 2 Peak	
Breakage Force	
after artificial	
weathering	
Pile yarn 2 Peak	
Breakage Force	
Green Reference	
value before 13.60	
artificial	
weathering	
Pile yarn 2 Peak	
Breakage Force	
Variation after Change ≤ 25 5.10	
weathering from %	
Green Reference	
value	
Pile yarn 3 Peak	
Breakage Force 0.00	
before artificial	
weathering	ļ
Pile yarn 3 Peak	
Breakage Force	
after artificial	
weathering	



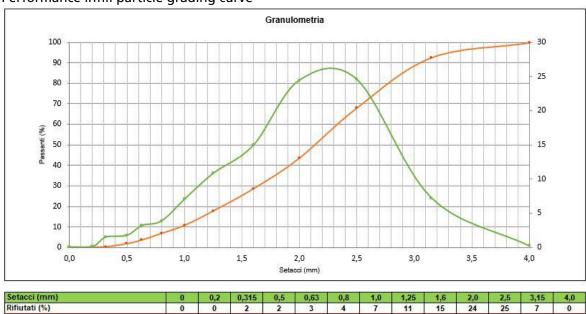
Name	Comment	Result		
Pile yarn 3 Peak	Comment	THE SUIT		
Breakage Force				
Green Reference				
value before		0.00		
artificial				
weathering				
Pile yarn 3 Peak				
Breakage Force				
Variation after	Change ≤ 25			
weathering from	%	0.00		
Green Reference	,,			
value				
Polymeric infill				
Colour change				
after artificial	≥ Grey scale 3	5		
weathering				
Polymeric infill				
Visual change in				
composition	No change	No change		
after artificial	into change	110 change		
weathering				
Complete system				
Water	> 180 mm/h	3843		
permeability	, 130			
Stitched joints				
Strength un-	2	0		
aged	1000N/100mm			
Stitched joints				
Strength water	≥	0		
aged	1000N/100mm			
Bonded joints				
Strength un-	≥ 75/100mm	100		
aged				
Bonded joints				
Strength water	≥ 75/100mm	93		
aged				
Carpet tuft				
Withdrawal force	≥ 40N	63		
un-aged				
Carpet tuft				
Withdrawal force	≥ 40N	52		
water aged				
	for			
Heat Category	information	Category 3		
Splash	for	4.50/		
Characteristics	information	> 1,5%		
7 - Miscellaneous (shock pad, sub-base - if part of the system)				
Shock Pad / E-		_		
layer tensile	. 0.15 MD-	0.17		
strength un-	≥ 0.15 MPa	0.17		
aged				
Sub-base				
	I	-		



Name	Comment	Result
Sub-base Particle		
size range		-
Sub-base Particle		
shape		-
Sub-base		
Thickness		-
Sub-base		
Compaction &		-
test method		
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. MS D2 132/6 XWR FIELD GREEN, S17 UVA report SPORTSLABS number 16744/1375 issued on 07/07/2016. MS D2 132/6 XWR LIME GREEN, S18 UVA report SPORTSLABS number 16744/1798 issued on 07/07/2016.



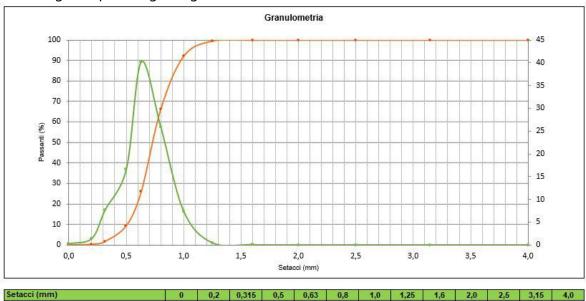
2 – Test Images
Performance infill particle grading curve





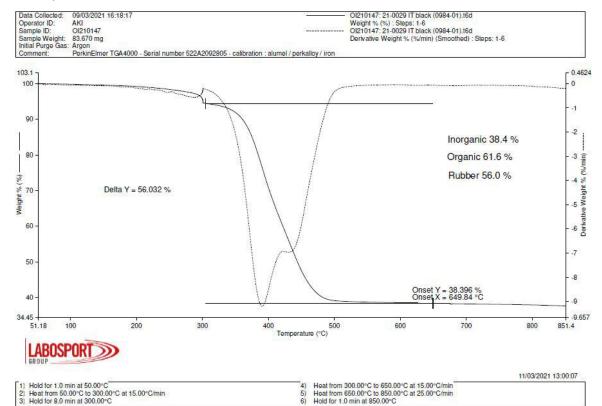
Stabilising infill particle grading curve

Rifiutati (%)





TGA of performance infill



Date: 26.02.2021





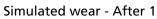




Simulated wear - Before 2









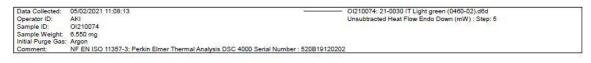


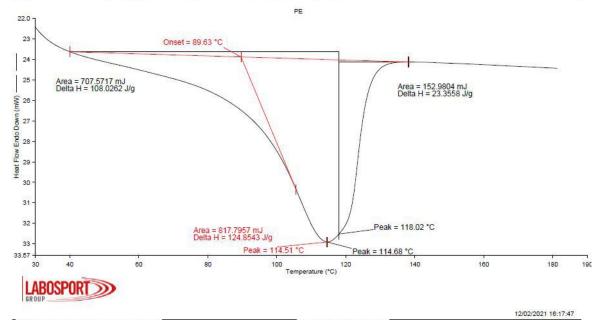
Simulated wear - After 2





Yarn Characteristics DSC





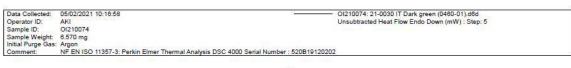
1) Heat from 20.00°C to 190.00°C at 20.00°C/min 2) Hold for 5.0 min at 190.00°C 3) Cool from 190.00°C to 20.00°C at 20.00°C/min

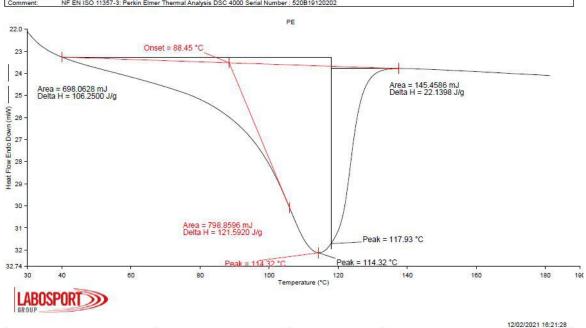
4) Hold for 5.0 min at 20.00°C 5) Heat from 20.00°C to 190.00°C at 20.00°C/min

Date: 26.02.2021



Yarn Characteristics DSC - 2





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

Hold for 5.0 min at 20.00°C
 Heat from 20.00°C to 190.00°C at 20.00°C/min









Performance Infill - picture





Cross-section Yarn 1

