



FIFA LABORATORY TEST REPORT

Test manual 2015
01.01.2015

Product	45MM POWERTURF
FIFA Licensee	Nurteks Hali San.ve Tic. A.S.
Test Institute	Kiwa ISA Sport B.V.
Test Number	66472
External Test Number	180800128-1g
Date of Test	30.10.2018
Test Result	Passed
Quality Level	FIFA Quality & Quality PRO
Test Type	Initial



Licensee

Main Address

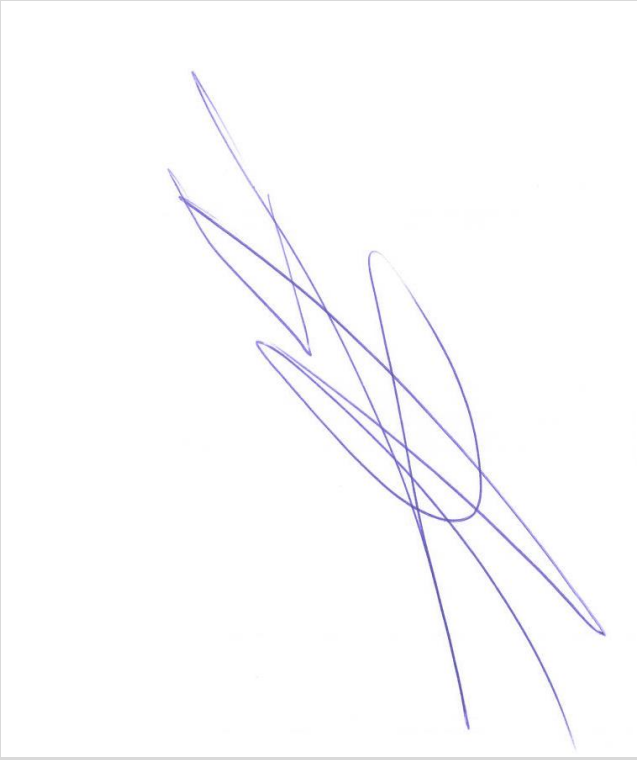
Name	Nurteks Hali San.ve Tic. A.S.
Address	Yesilköy Mah. Atatürk Cad. EGS Blokleri No:12 B2 Blok Kat:4
ZIP / City	34149 / ISTANBUL
Website	
Contact Email	sales@nurteks.com.tr
Contact Phone	


Test institute

Main Address

Name	Kiwa ISA Sport B.V.
Address	Papendallaan 31 Postbus 302
ZIP / City	6800 / ARNHEM
Website	
Contact Email	
Contact Phone	

Approval

Test Institute Director	J.G. Kieft
Signature	
Date	30.10.2018

Test Institute Engineer	N. Siemes
Signature	
Date	30.10.2018



1 – Test Results

Name	Comment	Result
1 - Summary		
Vertical ball rebound FIFA Quality		Passed
Vertical ball rebound FIFA Quality Pro		Passed
Angeled ball rebound FIFA Quality		Passed
Angeled 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		45MM POWERTURF
Product ID		
Synthetic Turf System		45MM POWERTURF
Performance infill		EPDM
Stabilising infill		Silica sand
Shock-pad or elastic layer		prefabricated shock pad
Sub-base composition		rigid engineered base
2 - Test Details Test Institute		
Date(s) of test		30.10.2016
Report created by		Natasja Siemes
Other Test Engineer on site		
Laboratory Test report number		180800128-1g
Test Institute Project number		
3 – Product Declaration (Manufacturer)		
Manufacturer		Nurteks
Tuft pattern		straight
Yarn manufacturer yarn 1		Bonar yarns



Name	Comment	Result
Product name, code yarn 1		rain forced diamond sp new olive green 7309-195 µm and new sports green 720 - 195 µm
Pile yarn profile yarn 1		Diamond
Pile thickness (µ m) yarn 1		365.0
Pile colour (RAL) value 1 yarn 1		110 40 30
Pile colour (RAL) value 2 yarn 1		130 40 30
Pile colour (RAL) value 3 yarn 1		
Pile width (mm) yarn 1		1.30
Number of tufts/m2 yarn 1	ISO1773	18400.00
Pile length (mm) yarn 1	ISO 2549	47.00
Pile weight (g/m2) yarn 1	ISO 8543	1500.00
Pile yarn characterization yarn 1		PE
Pile yarn dtex yarn 1		8000
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		



Name	Comment	Result
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		C18
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/m2)		1100.0
Carpet Minimum tuft withdrawel force (N)		30
Carpet Carpet mass per unit area (g/m2)		2750.0
Method of jointing		bonded
Bonded joints Adhesive brand name		AYKA FLOUR HENKEL
Bonded joints Adhesive manufacturer		AYKA FLOUR HENKEL
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 lm)		
Performance Infill Product name, code		RUBFELX



Name	Comment	Result
Performance Infill Manufacturer		BENLI GERIDONUSUM
Performance Infill Material type		Black EPDM
Performance Infill Material grading		1.6 - 3.35 mm
Performance Infill Particle shape	prEN 14955	A2
Performance Infill Particle size range	EN 933-Part 1	1.6 - 3.35 mm
Performance Infill Bulk density (g/cm ³)	EN 1097-3	0.480
Performance Infill Application rate (kg/m ²)		9.0
Stabilising Infill Product name, code		Silica sand
Stabilising Infill Manufacturer		Local Sand Suppliers
Stabilising Infill Material type		Silica sand
Stabilising Infill Material grading		0.2 - 1.00 mm
Stabilising Infill Particle shape	prEN 14955	C1
Stabilising Infill Particle size range	EN 933-Part 1	0.315 - 1.00 mm
Stabilising Infill Bulk density (g/cm ³)	EN 1097-3	1.50
Stabilising Infill Application rate (kg/m ²)		17.0
Shockpad, E-layer Product name, code		EPDM Kauçuk shockpad
Shockpad, E-layer Manufacturer		Kopuzlar Eva Kauçuk tic. a.ş.
Shockpad, E-layer Type		prefabricated
Shockpad, E-layer Composition		cross linked closed cell PE foam
Shockpad, E-layer Bulk density (g/cm ³)		27.00
Shockpad, E-layer Thickness	EN 1979	9.0
Shockpad, E-layer Shock absorption (%)	FIFA 4a	29.0
Shockpad, E-layer Deformation	FIFA 5a	6.5
Shockpad, E-layer Tensile strength (N)		0.15
Shockpad, E-layer Mass per unit area (kg/m ²)		0.3
Other, detail		
4 – Product Identification		



Name	Comment	Result
Artificial Turf Carpet mass per unit area [g/m ²]		2938
Artificial Turf Tufts per unit area [m ²]		18932
Artificial Turf Pile length above backing [mm]		47.0
Artificial Turf Pile weight [g/m ²]		1560
Artificial Turf Water permeability of carpet [mm/h]		1715
Artificial Turf Free pile height		15
Performance infill Particle size range [mm]		1.25-3.35
Performance infill Particle shape		A2
Performance infill Bulk density [g/cm ³]		0.470
Performance infill Infill depth [mm]		18
Performance infill Thermographic analysis organic [%]		50
Performance infill Thermographic analysis inorganic [%]		50
Stabilising infill Particle size range [mm]		0.5 - 1.0
Stabilising infill Particle shape		C2
Stabilising infill Bulk density [g/cm ³]		1.51
Shock pad / E-layer Shock absorption [%]	if part of supplied system	32.0
Shock pad / E-layer Deformation	if part of supplied system	6.5
Shock pad / E-layer Thickness	if part of supplied system	9.4
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	0.82



Name	Comment	Result
Vertical Ball Rebound Initial Wet (Pro)	0.6 - 0.85m	0.82
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	0.84
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	
Angeled Ball Rebound Dry	45 - 80 %	54
Angeled Ball Rebound Wet	45 - 80 %	65
Reduced Ball Roll Initial Dry (Quality)	4 - 10 m	6.0
Reduced Ball Roll Initial Dry (Pro)	4 - 8 m	6.0
Reduced Ball Roll after simulated wear 3'000 cycles (5*) Dry	4 - 8 m	6.3
Reduced Ball Roll after simulated wear 3'000 cycles (5*) Wet	4 - 8 m	6.6
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	7.3
Reduced Ball Roll after simulated wear 6'000 cycles (5*) Wet	4 - 12 m	7.1
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 %	64.6
Shock absorption Initial Dry (Pro)	62 - 68 %	64.6
Shock absorption Initial Wet (Quality)	57 - 68 %	64.7
Shock absorption Initial Wet (Pro)	62 - 68 %	64.7



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 %	61.7
Shock absorption after simulated wear 6'000 cycles (20*)	57 - 68 %	
Shock absorption 50°C	57 - 68 %	64.50
Shock absorption -5°C	57 - 68 %	65.80
Deformation Initial Dry (Quality)	6 - 11 m	10.0
Deformation Initial Dry (Pro)	6 - 10 m	10.0
Deformation Initial Wet (Quality)	6 - 11 m	10.0
Deformation Initial Wet (Pro)	6 - 10 m	10.0
Deformation after simulated wear 3'000 cycles (5*)	6 - 10 m	9.0
Deformation after simulated wear 3'000 cycles (20*)	6 - 10 m	
Deformation after simulated wear 6'000 cycles (5*)	6 - 11 m	8.5
Deformation after simulated wear 6'000 cycles (20*)	6 - 11 m	
Rotational Resistance Initial Dry (Quality)	27 - 48 Nm	42
Rotational Resistance Initial Dry (Pro)	32 - 43 Nm	42
Rotational Resistance after simulated wear 3'000 cycles (5*)	32 - 43 Nm	41
Rotational Resistance after simulated wear 3'000 cycles (20*)	32 - 43 Nm	
Rotational Resistance after simulated wear 6'000 cycles (5*)	27 - 48 Nm	40
Rotational Resistance after simulated wear 6'000 cycles (20*)	27 - 48 Nm	
Other, detail		
5 – Test Results Player / Surface interaction		



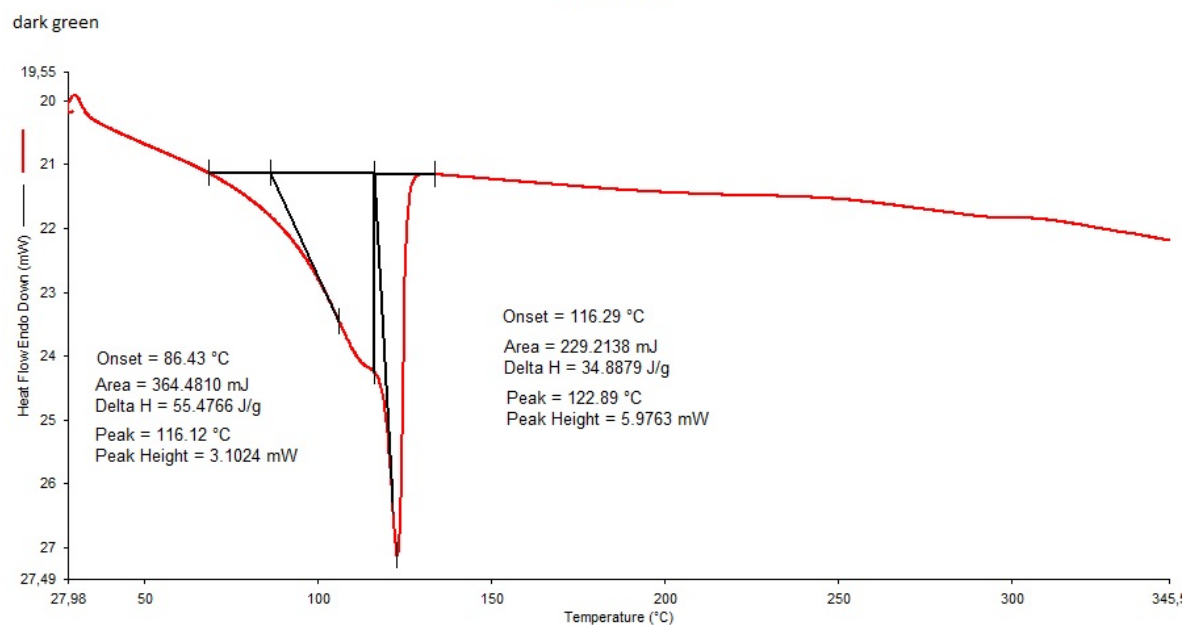
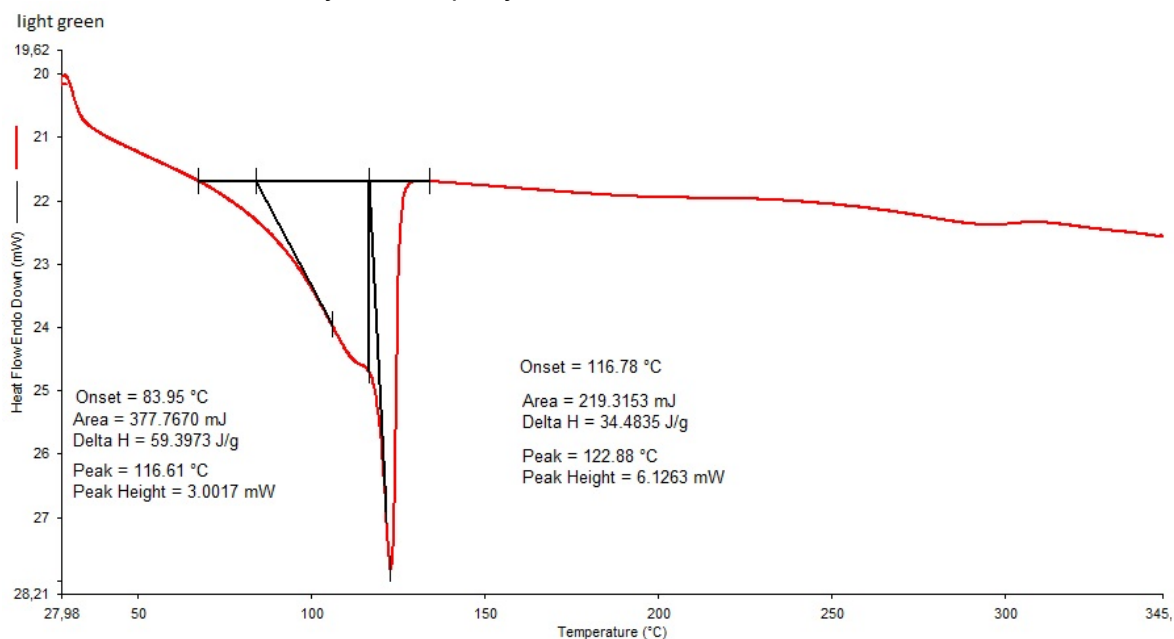
Name	Comment	Result
Skin / surface friction Dry	0.35 - 0.75 μ	0.69
Skin / surface friction Dry 3'000 cycles	0.35 - 0.75 μ	
Skin / surface friction Dry 6'000 cycles	0.35 - 0.75 μ	
Skin abrasion Dry	$\pm 30 \%$	-22
Skin abrasion Dry 3'000 cycles	$\pm 30 \%$	
Skin abrasion Dry 6'000 cycles	$\pm 30 \%$	
6 – Environmental impact (artificial, light, water)		
Pile yarn 1 Colour change after artificial weathering	\geq Grey scale 3	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 $\leq 50 \%$	-17.3
Pile yarn 2 Yarn tensile strength after artificial weathering	Change $\leq 50 \%$	-12.0
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	$> 180 \text{ mm/h}$	1172
Stitched joints Strength un-aged	$\geq 1000\text{N}/100\text{mm}$	
Stitched joints Strength water aged	$\geq 1000\text{N}/100\text{mm}$	
Bonded joints Strength un-aged	$\geq 75/100\text{mm}$	99
Bonded joints Strength water aged	$\geq 75/100\text{mm}$	93
Carpet tuft Withdrawal force un-aged	$\geq 30\text{N}$	37
Carpet tuft Withdrawal force water aged	$\geq 30\text{N}$	35
Heat Category	for information	2-3



Name	Comment	Result
Splash Characteristics	for information	2.4
7 - Miscellaneous (shock pad, sub-base - if part of the system)		
Shock Pad / E-layer tensile strength un-aged	≥ 0.15 MPa	0.31
Sub-base Composition		
Sub-base Particle size range		
Sub-base Particle shape		
Sub-base Thickness		
Sub-base Compaction & test method		
Other, detail		

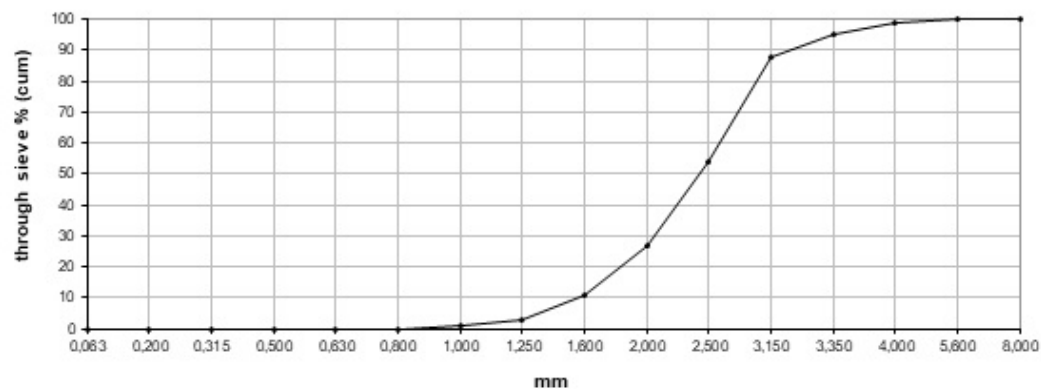
2 – Test Images

DSC Diff. Scan. Colorimetry scans of pile yarn

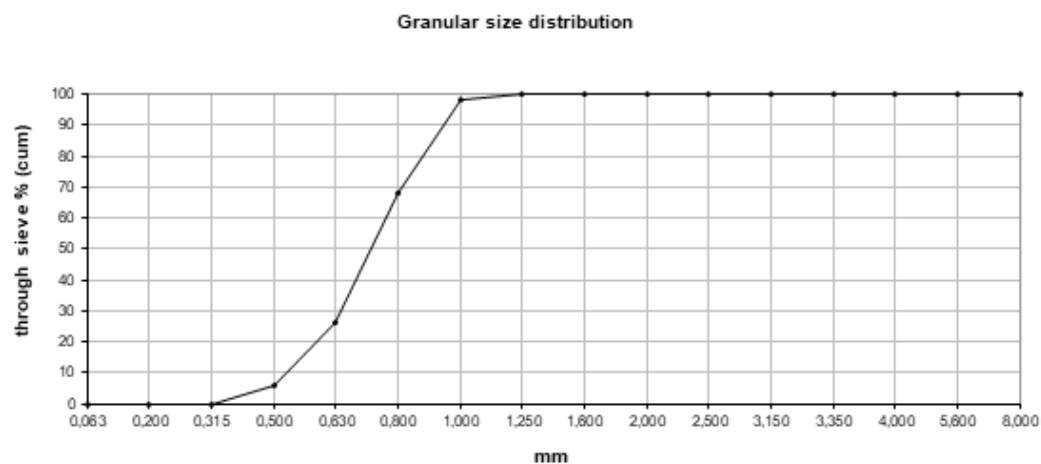


Performance infill particle grading curve

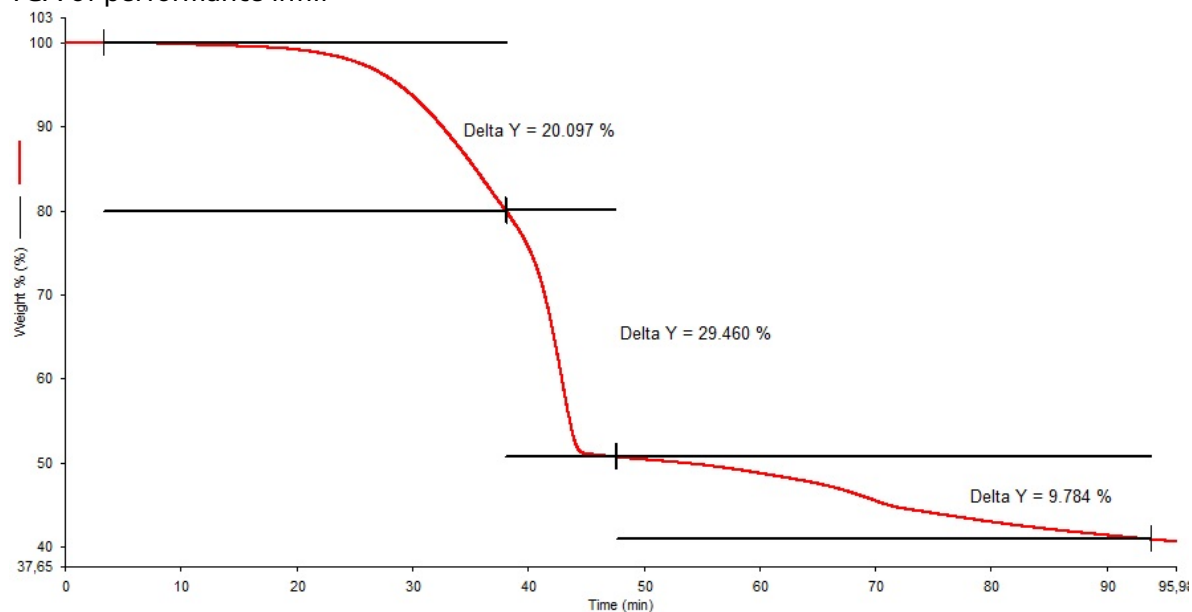
Granular size distribution



Stabilising infill particle grading curve



TGA of performance infill



Simulated wear - Before 1



Simulated wear - Before 2



Simulated wear - After 1



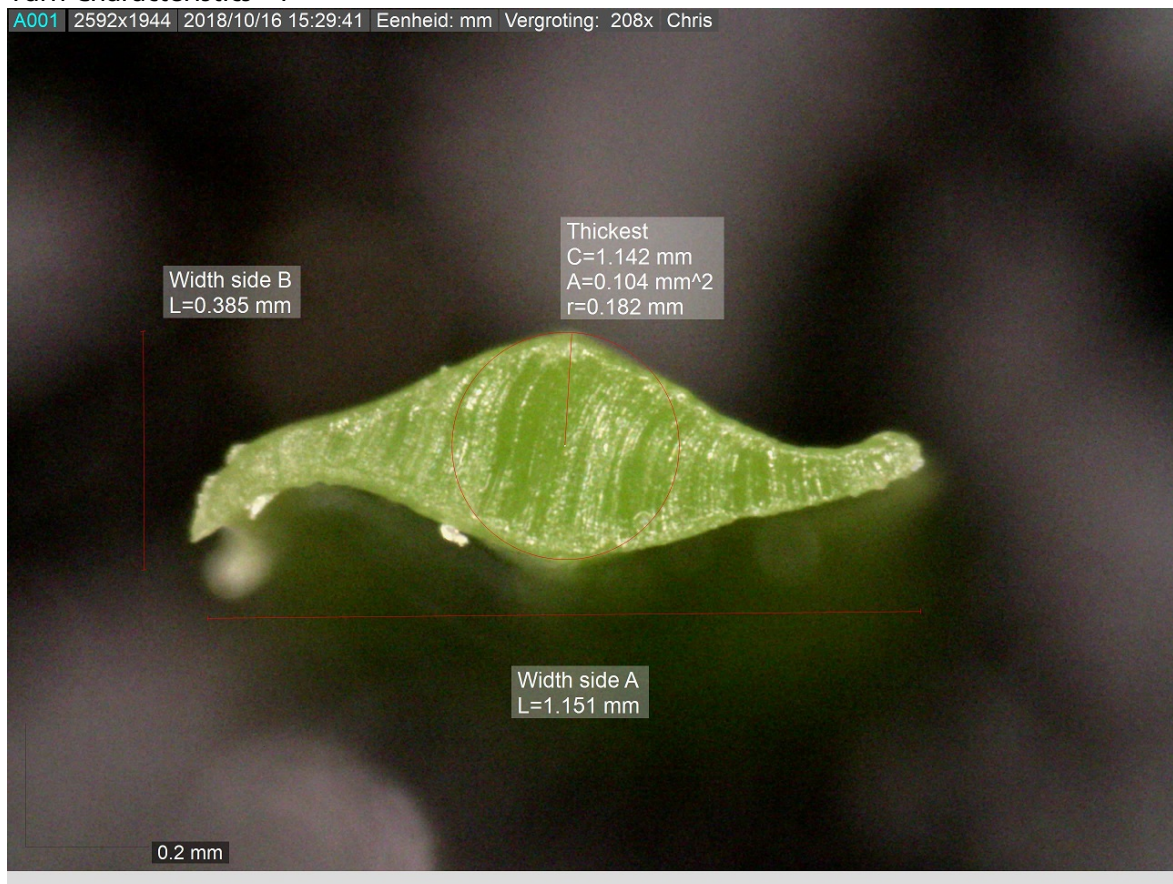
Simulated wear - After 2

A005 2048x1536 2018/10/04 11:22:15



Yarn Characteristics - 1

A001 2592x1944 2018/10/16 15:29:41 Eenheid: mm Vergroting: 208x Chris



Yarn Characteristics - 2

A003 2592x1944 2018/10/16 15:18:37 Eenheid: mm Vergroting: 208x Chris

