play AUSTRALIA

proudly promoting the value of play and supporting all Australians to play every day

Sport Surface Standards

Perceptions, Realities, Aspirations and Testing

ACOUSTOSCAN

Acousto-Scan Pty Ltd

44/59 Halstead str., South Hurstville, NSW 2221
Sydney, Australia

- One of the oldest Sports Laboratory – Started 1993
- 5 people in Australia + 6 in Asia + 2 in India, + 2 in France
- Worldwide operations
- Asian branch since 2014 , France since 2018
- ISO 17025 / NATA international laboratories

Now In Asia and India

Declaration
Conflict of Interest

- Martin works for Smart Connection and prepares the documents for the tender process for Councils
- I (Grant Humphreys) work for Acousto-Scan as a Test Institute for the world Sporting Bodies.
- FIFA, WR, FIH , ITF, FIBA, CA, AFL etc.

- We are both in the same industry but do not profit from each other.

- We both see the benefit of this training opportunity.

Grant Humphreys

ACOUSTOSCAN

- 1981 Associate Diploma Metallurgy
- 1978-1982 Foundry Metallurgist Quality Castings
- 1983-1995 Failure investigation Metallurgist and Electron Microscopist
- NATA Signatory for Chemistry and Mechanical Testing for ADI Garden Island Navy Laboratory
- 1995 Director, PlayTest Pty Ltd, Solar G Pty Ltd and Playfix Pty Ltd
- 2002 NATA Signatory for Critical Fall Height Testing to AS4422
- 2005 ROSPA Level 2
- 2005 FIFA Field test institute RR
- 2007 FIFA test institute RR
- 2009 FIFA test institute RR
- 2010 FIFA test institute RR
- 2010 Australian Standard Committee CS-005 Playground
- 2018 Australian Standard Committee CS101
- 2019 FIBA Certified Test Institute

What We are Talking about today
Sports Field Surfaces

- Testing

- Sports Field or Venues


BREWONGLE STAND
THE STAR
SESSION ALE

Why do an Artifical Surface?

- Lasts longer than Grass
- Allows More Hours of Play on the surface 2x
- All weather surface (Play not stopped by rain)
- Washout weeks are a major headache for sporting administrators, especially in winter.
- Urban crowding has lead to overuse and not enough space in the cities to have a grass fields.
- The artificial Grass pitch is a **Win / Win** (for council)
- Council can have the training on the artificial grass during the week and than play on the natural grass on the weekend.
- Both surfaces compliment each other.
- The should be seen as working together, not one or the other.

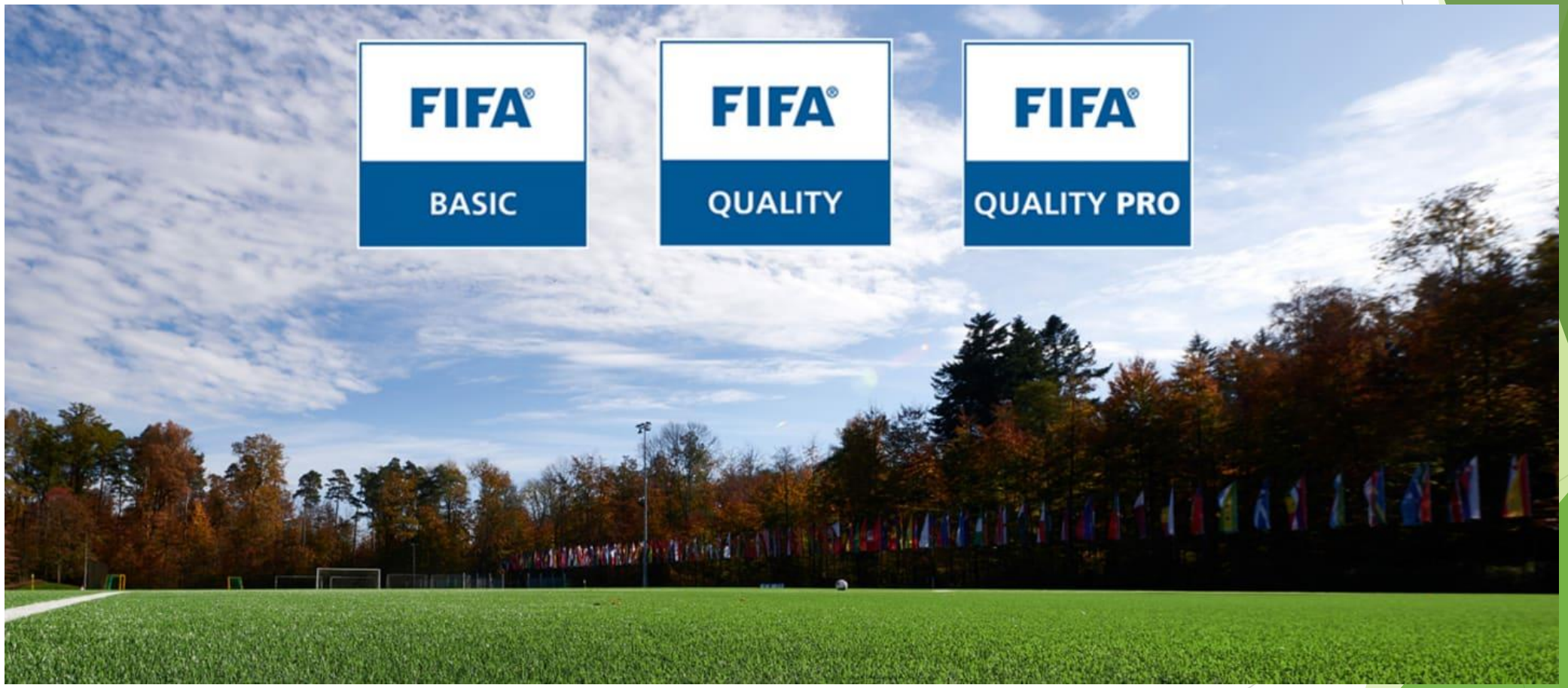
Sport and exercise are the Winner

Sports Testing : Multiple sports

- Testing to Standards ISO, ASTM, AS, EN, DIN , etc
- Field Testing
- Product Testing
- Quality Control Testing of the Product on Site.

FIFA

- One code we will look at today



FIFA Quality Concept

The FIFA quality concept is the certification of a particular field that has been found to fully comply meet the requirements of the Quality Concept.

It is not the approval of a products.

To gain such certification a FIFA licensee need to under-take two phases of testing .

Laboratory testing and Field Testing

I will show you what is involved to complete a FIFA test

Field Testing

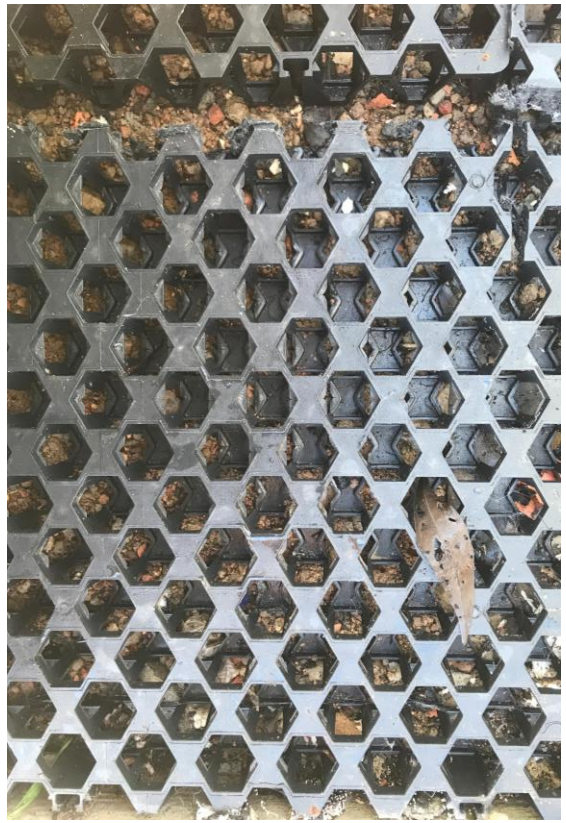
Table 3 - Field Test Requirements

Characteristic	Test Method	Requirement					
		FIFA QUALITY PRO		Consistency[6]	FIFA QUALITY		Consistency[7]
Vertical ball rebound	FIFA 01	60cm - 85cm		± 5% relative	60cm - 100cm		±10% relative
Ball roll	FIFA 03	Initial assessment	4m - 8m	±10% relative	Initial assessment	4m – 10m	±15% relative
		Re-tests	4m – 8m	±10% relative	Re-tests	4m – 12m	±15% relative
Shock Absorption	FIFA 04a	60% - 70%		± 5% relative	55% - 70%		±10% relative
Vertical Deformation	FIFA 05a	4mm – 10mm		±10% relative	4mm – 11mm		±15% relative
Rotational Resistance	FIFA 06 & 06a	30Nm - 45Nm		± 6% relative	25Nm – 50Nm		±10% relative
Surface regularity of playing surface	FIFA 12	<10mm		-	<10mm		-
Free pile height	FIFA 18	For information		-	For information		-
Infill depth	FIFA 21	For information		-	For information		-
Minimising infill migration into the environment - Field design	FIFA 27	For information		-	For information		-

Straight Edge

- Straight edge
- Planarity test
- We are looking for defects >10mm

Visual Inspection Is Just as important as the Straight Edge



Vertical Ball Rebound

Ball Roll






Advanced Artificial Athlete (AAA)

- Shock Absorbency
- Vertical Deformation
- Energy Restitution

Test Equipment Outside Inside

- Ball Roll
- Samples Grass , Sand , Rubber
- Tractor and Drag Brush

Product Tests on the Field

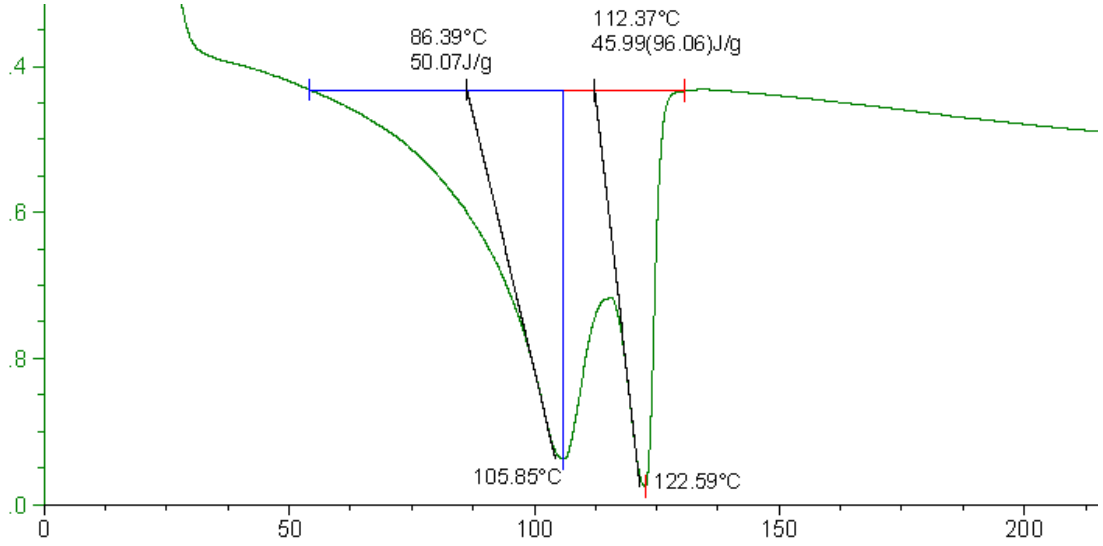
Table 4 - Material identification and consistency – first site test

Component	Characteristic	Test method	Permitted variation between manufacture's declaration and installed materials
Artificial turf – All colours including line markings	Mass per unit area	ISO 8543	≤ ± 10%
	Tufts per unit area	ISO 1763	≤ ± 10%
	Tuft withdrawal force	FIFA Test Method 26	≥ 90% of manufacturer's declaration ≥40N average
	Pile length above backing	ISO 2549	≤ ± 5%
	Total pile weight	ISO 8543	≤ ± 10%
	Water permeability of carpet (non-infill)[8]	FIFA Test Method 24	≥180mm/h and greater than 75% of laboratory result[9]
Pile yarn(s) – All colours including line markings	Thickness of yarn	FIFA Test Method 25	≥ 90%
	Pile yarn characterisation	FIFA Test Method 22	Same polymer
	Yarn Dtex	FIFA Test Method 23	≤ ± 10%
	UV stabilizer	FIFA Test Method 19	Report for every masterbatch
Performance infill (if supplied as part of system)	Particle size	FIFA Test Method 20	Maximum 1 sieve difference, 60% between d and D
	Particle shape	EN 14955 procedure 6.3	Similar shape
	Bulk density	EN 1097-3	≤ ± 15%
	Composition	FIFA Test Method 11	≤ ± 15% relative
Stabilising infill (if supplied as part of system)	Particle size	FIFA Test Method 20	Maximum 1 sieve difference, 60% between d and D
	Particle shape	EN 14955 procedure 6.3	Similar shape
	Bulk density	EN 1097-3	≤ ± 15%
Shockpads / e-layers[10] (if supplied as part of system)	Shock Absorption	FIFA Test Method 4a	≤ ± 5% Force Reduction
	Thickness	EN 1969	≥ 90% of manufacturer's declaration

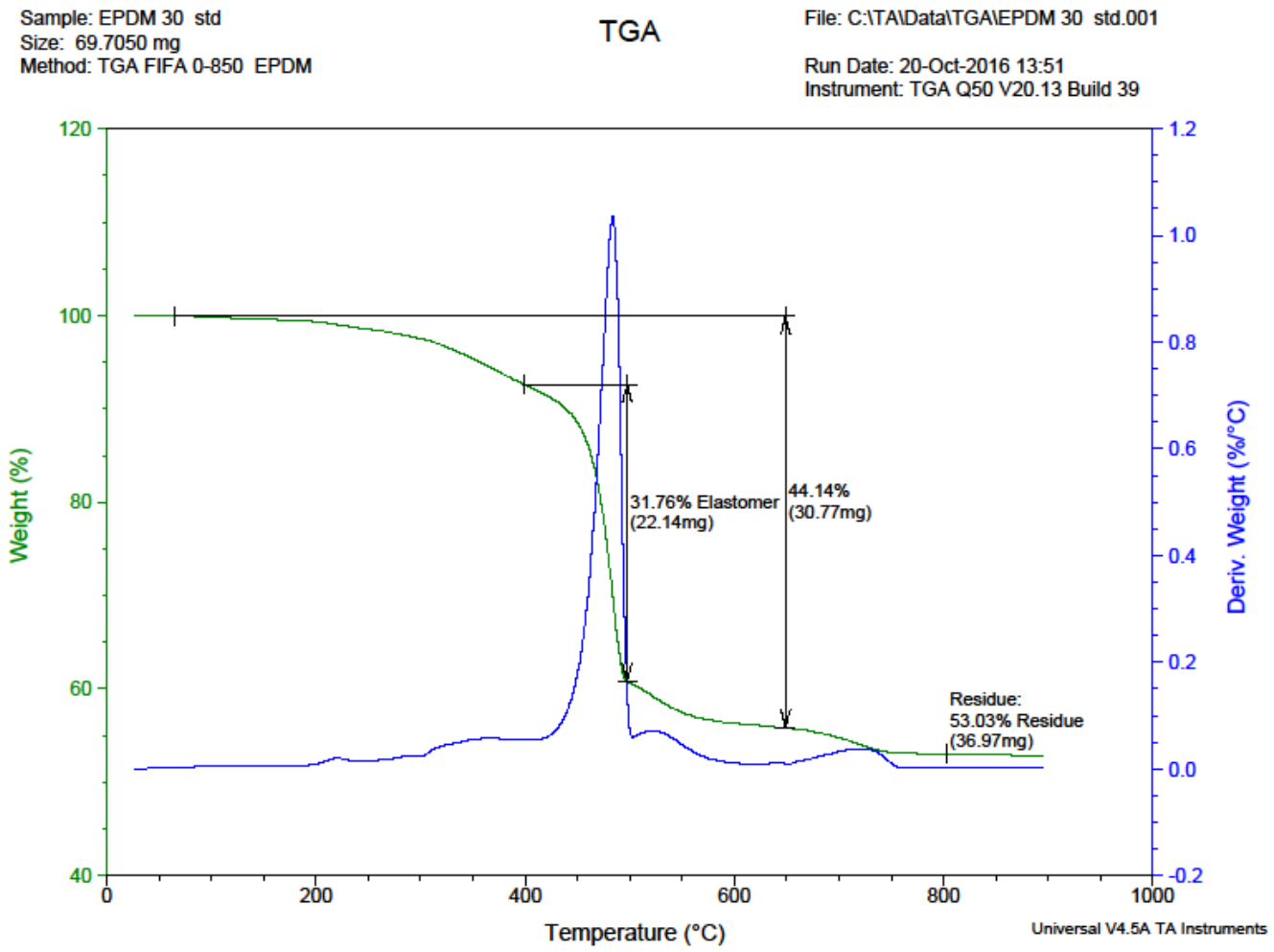
Product Tests compared to the Product Report

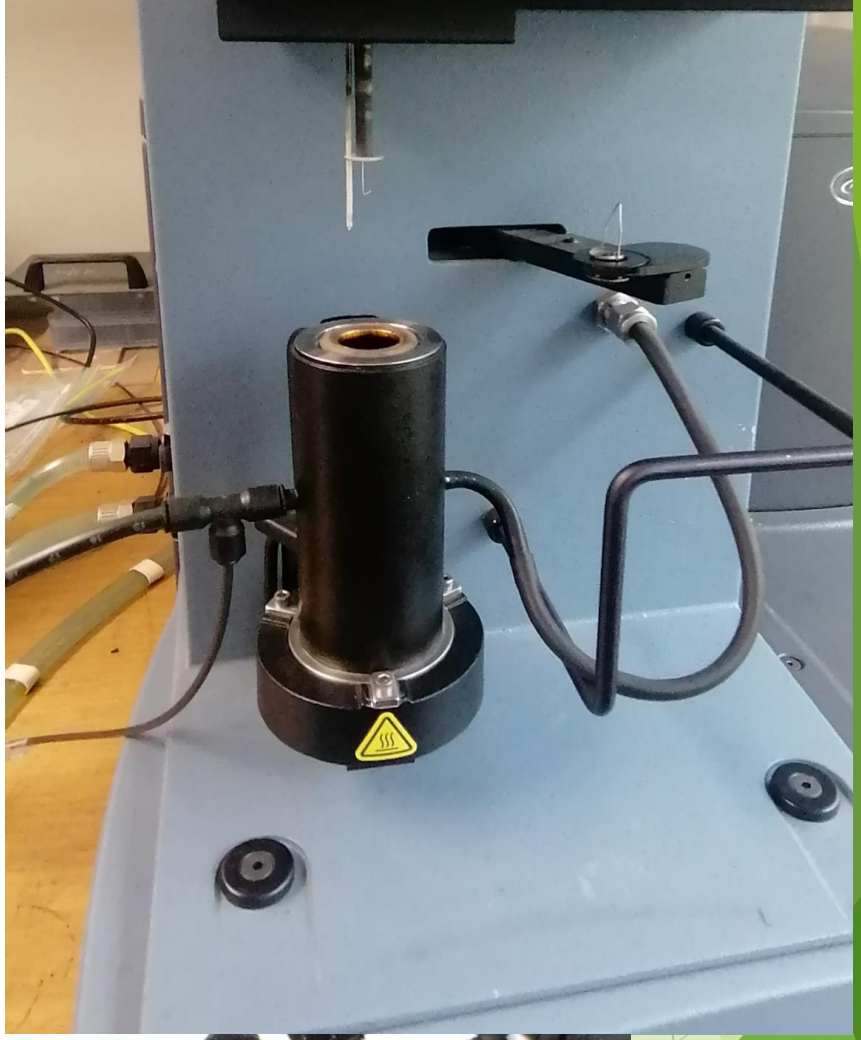
Component	Characteristic	Tets Method	Findings	Declaration	Units	Variation	Variation	Pass
Artifical Turf	Mass per unit Area	ISO 8543	2940	3147	g/m2	≤ ± 10%	-0.07	Pass
	Tufts per unit Area	ISO 1763	8000	8190	/m2	≤ ± 10%	-0.02	Pass
	Tuft Withdrwal	ISO 4919	45	30	N	>90%	1.67	Pass
	Pile Length above backing	ISO 2549	65	65	mm	≤ ± 5%	0	Pass
	Total Pile Wt	ISO 8543	1500	1490	g/m2	≤ ± 10%	0.01	Pass
	Dtec		6000	6000	g/m2	≤ ± 10%	0	Pass
Pile Yarn	Oile Yarn Characterisation	DSC	113.87 122.49	113.97 123.76		Same	same	Pass
	Water perm	EN12616	3000	2983	mm/h	≥ 180 >75% lab	1.01	Pass
Infil	Infill Depth	EM1969	45	50	mm	± 15%	-0.11	Pass
Performance Infill	Particle Size	EN933-1	0.5 -2.0	0.8 -2.5	mm	≤ ± 20%	same	Pass
	Particle Shape	EN14955	Angular	Retangular		Similar Shape	same	Pass
	Bulk Density	EN1097-3	0.46	0.52	g/cm3	≤ ± 15%	-0.13	Pass
Stabilising Infil	Particle Size	EN933-1	0.2- 0.8	0.4 -0.8	mm	≤ ± 20%	-0.05	Pass
	Particle Shape	EN14955	sub round	round		Similar Shape	same	Pass
	Bulk Density	EN1097-3	1.44	1.56	g/cm3	≤ ± 15%	-0.08	Pass

Differential Scanning Calorimeter



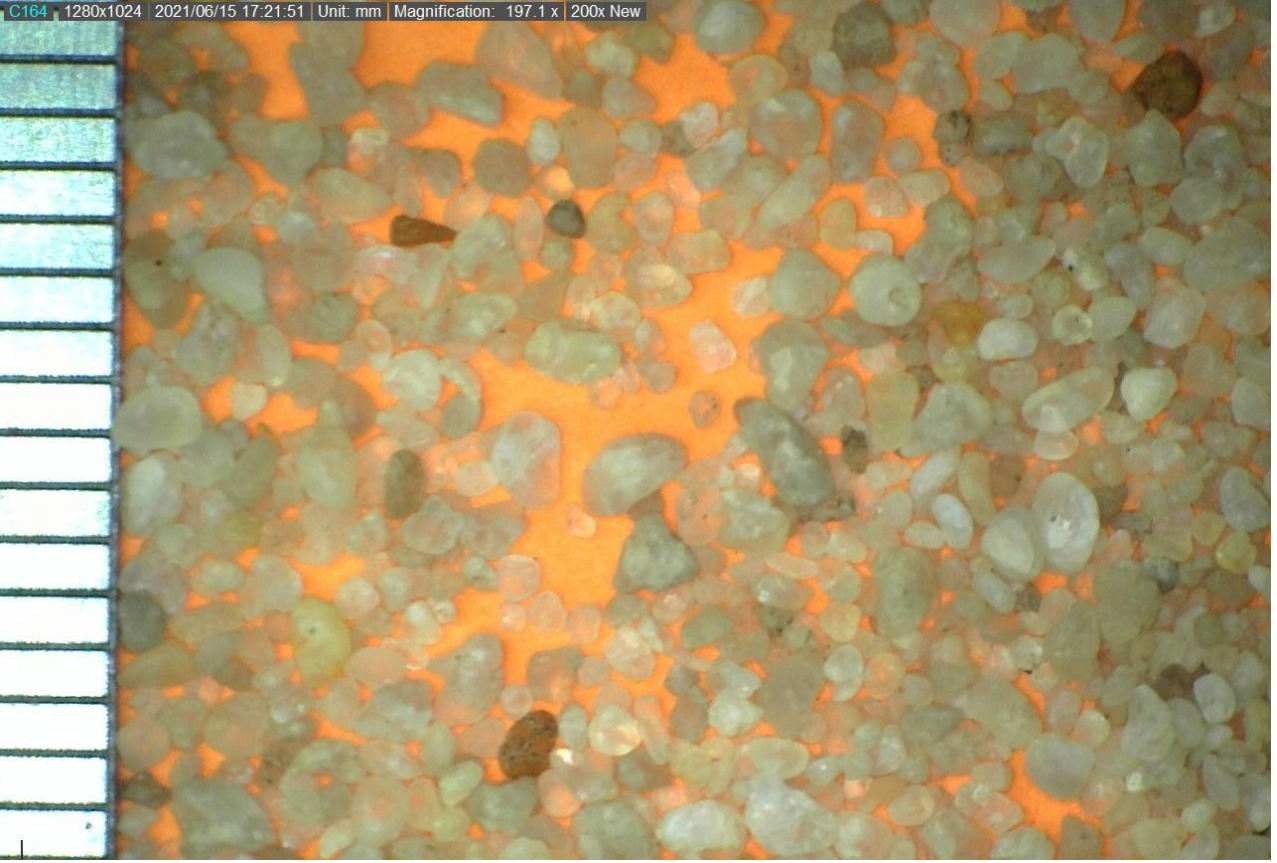
Thermographic Analyser TGA





Grass Identification

- DTEC
- Mass Per Unit Area
- Tuffs per Unit area
- Pile Length
- Pile Weight
- DSC
- Yarn Thickness
- Water Permability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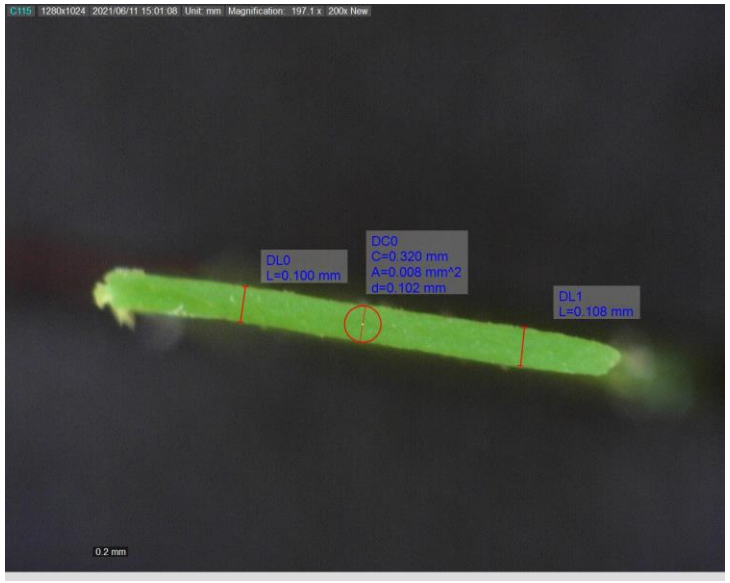
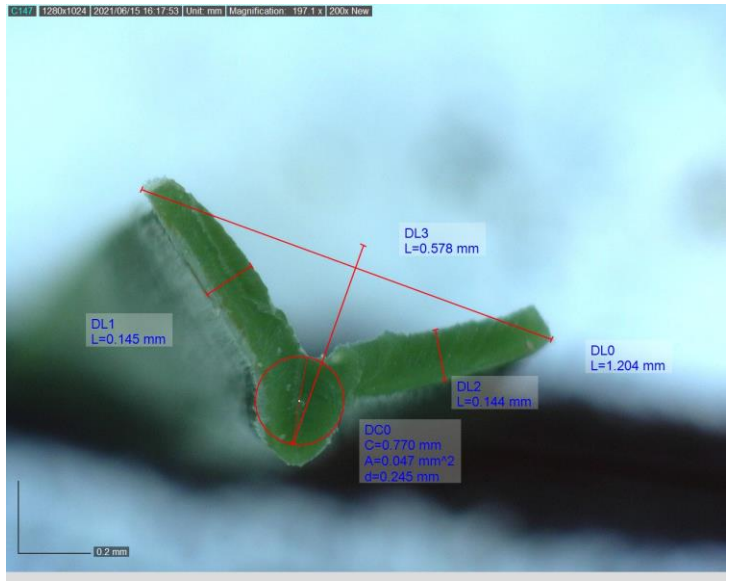
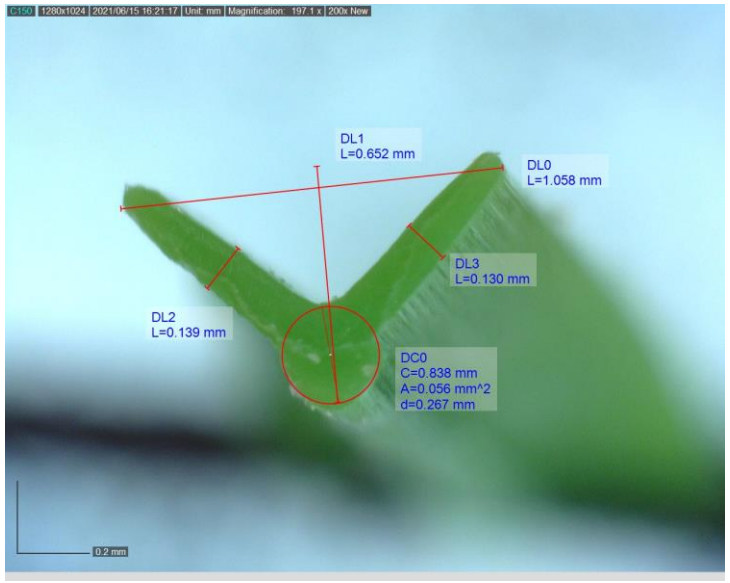
Infill

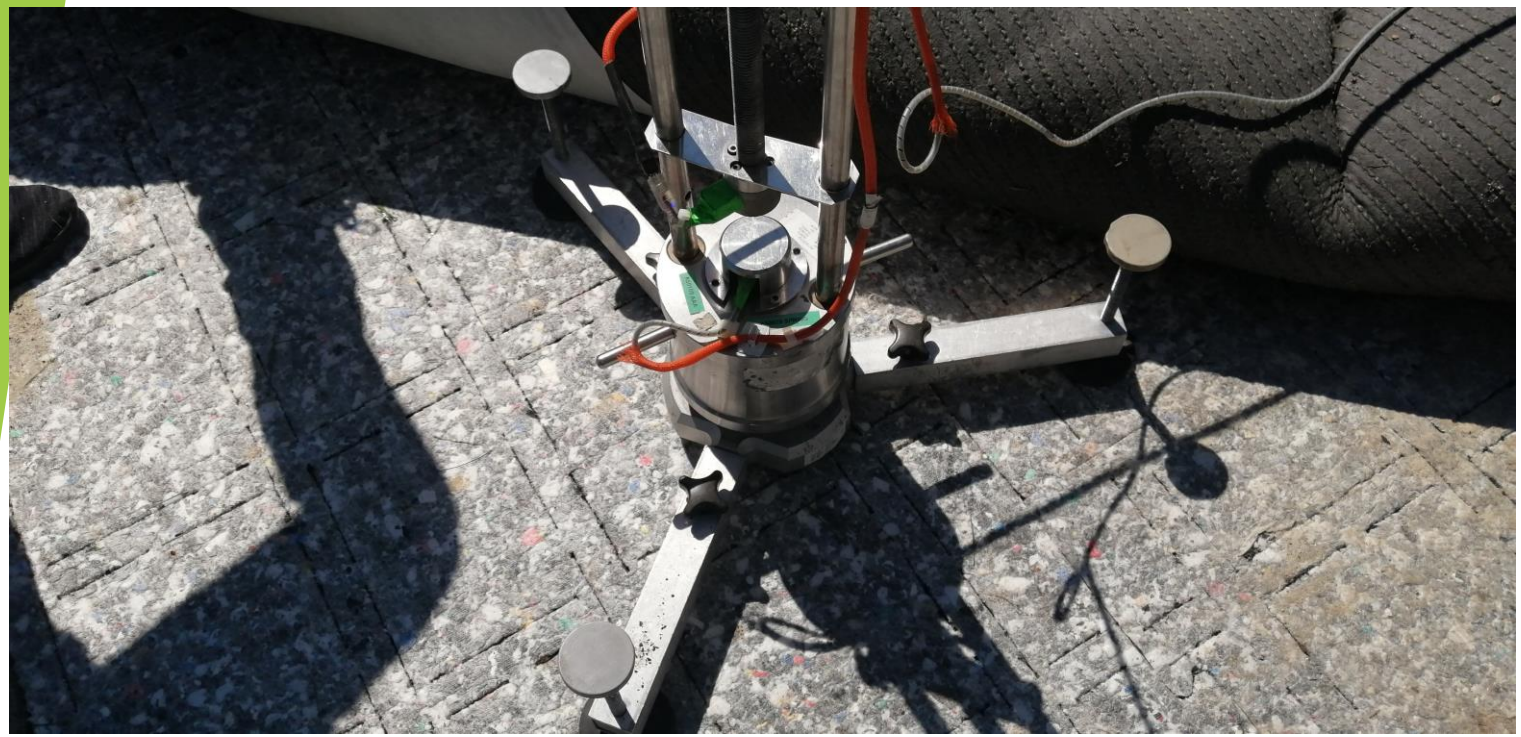


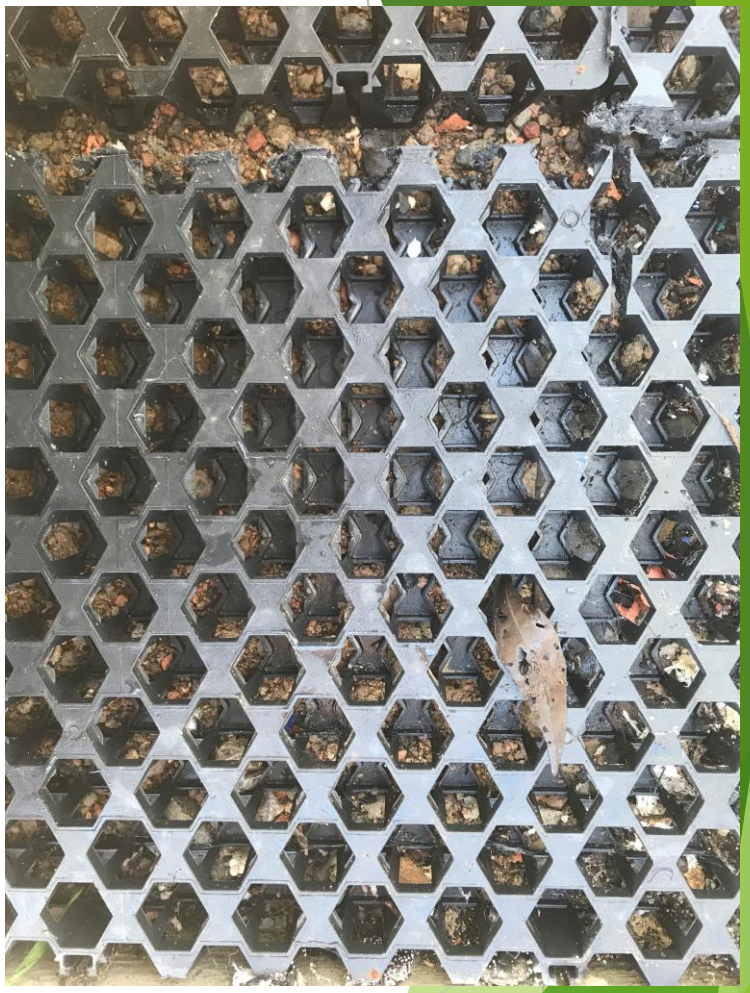




Yarn Thickness

Identification



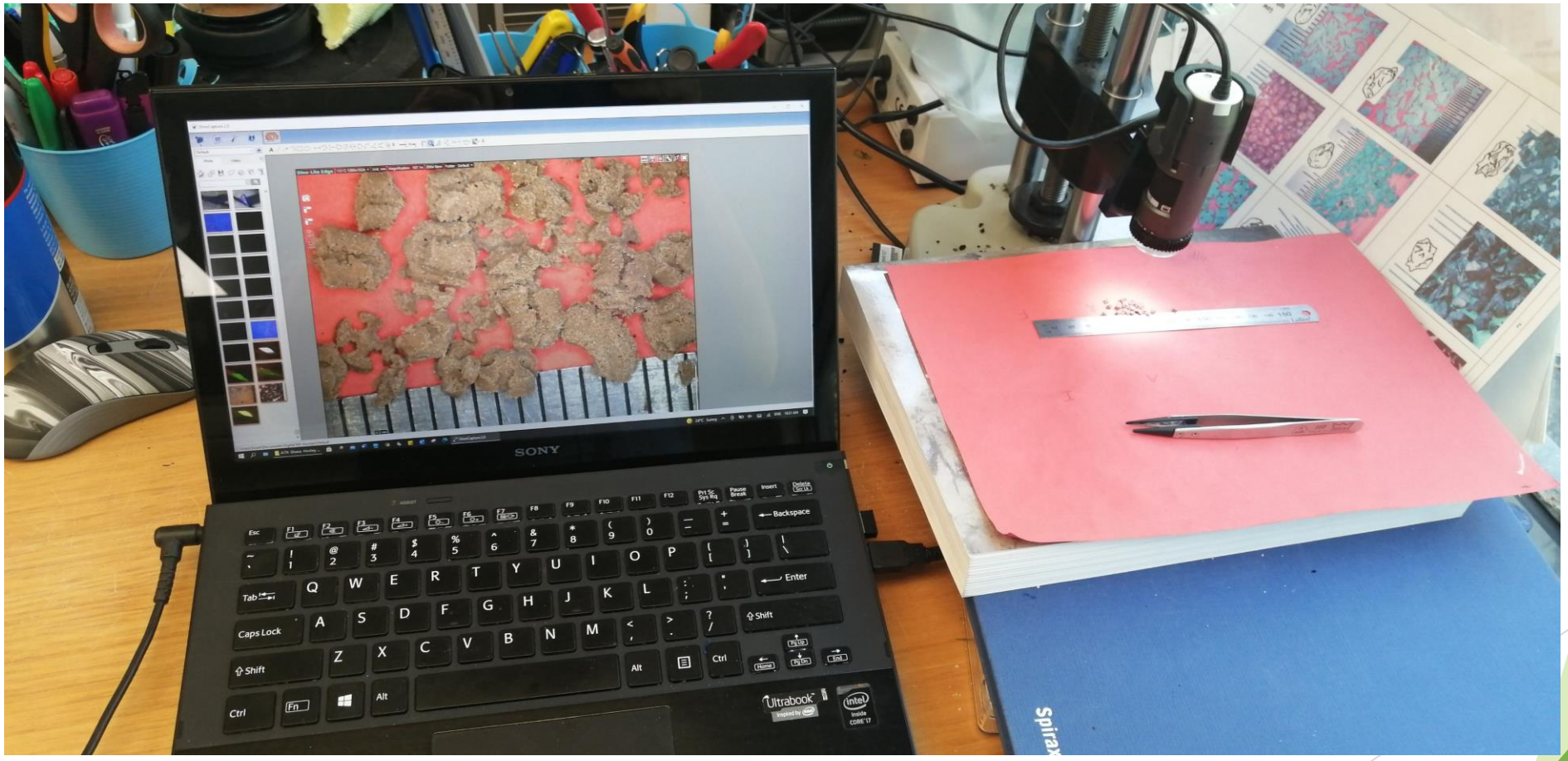


Base Testing

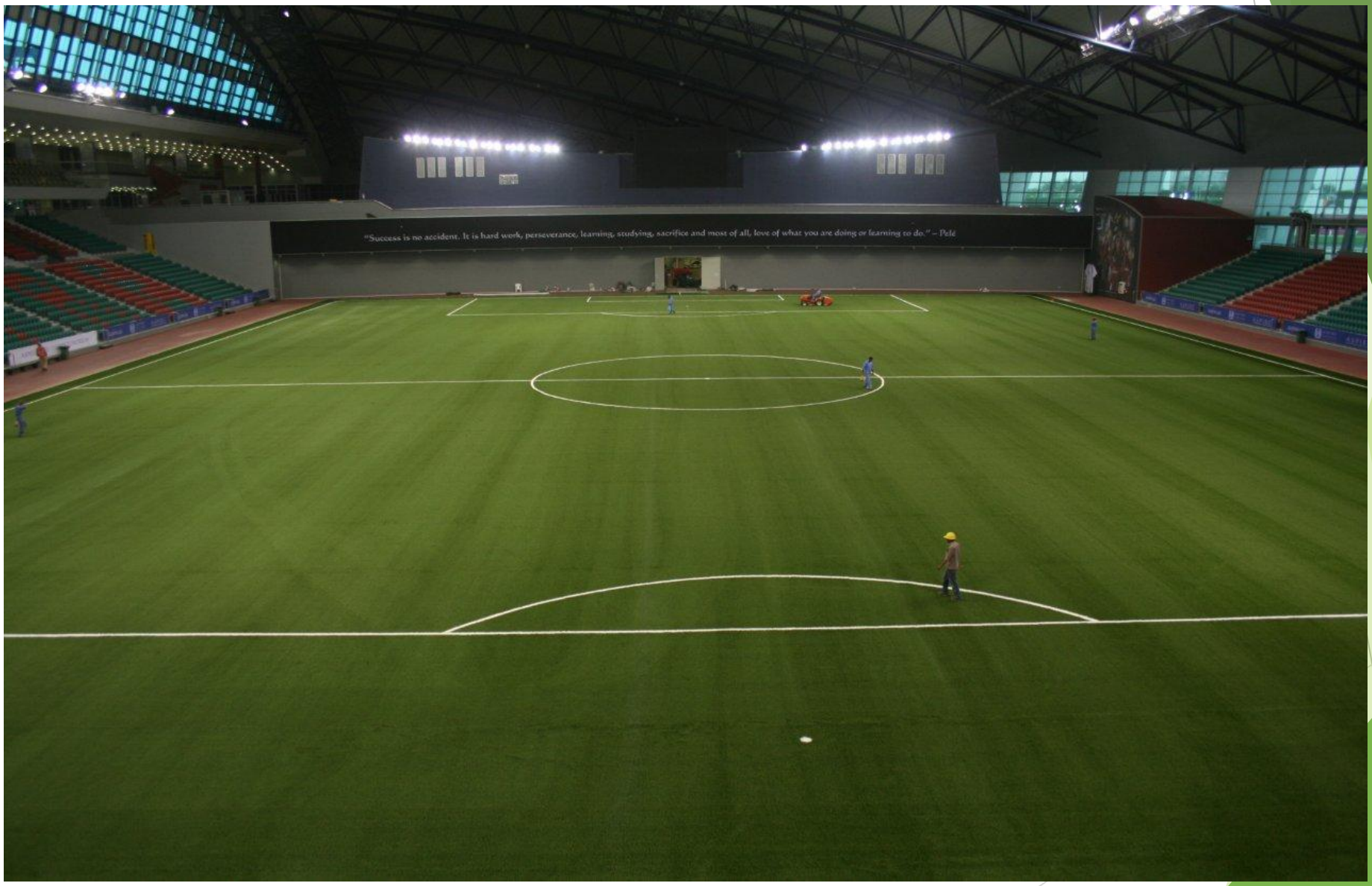
Friction

Infill Mitigation

- MicroPlastics
- AS17432 Infill Mitigati



Questions


"Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do." – Pelé