



winther
SPORT & FRITID

Greenfields

A TenCate Grass Company



GreenFields

sustainable system design

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- Introduction
- Sustainability
- System evolution
- Turf system carpet
- Centre for Turf Innovation
- What is Non-Infill turf
- GreenFields Pure PT
- Cost of ownership



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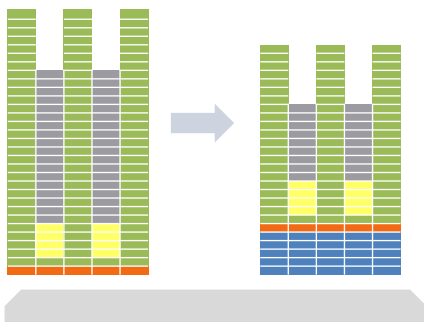
Sustainability - What are the Current Market Drivers?

- Industry and worldwide topic
- Legislation - microplastics
- Life Cycle Assessment
 - ESTC – Product Environmental Footprint Category Rules – Turf System
 - Raw Material Source, Yarn and Carpet Production, Transportation, Installation, Facility Operation, End of Life
- Recyclability – designing to recycle
 - Majority of the existing marketplace 3+ material types
 - 1 family - Use of same material family for yarns, backing and coating (100% Polyolefin PE and PP)
 - 1 DNA – Use of same DNA for yarns, backing and coating (100% PE or PP for example)
- Balancing sustainability with performance and cost
 - Don't forget about the player!

Turf System – Evolution

1 REDUCE

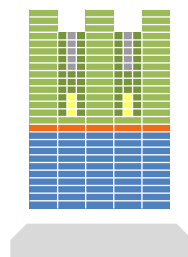
Low Infill Solutions
Infill Containment



- ✓ Move from 60 mm toward 45 – 50 mm pile length systems
- ✓ Add shockpad layer and reduce infill volume

2 REPLACE

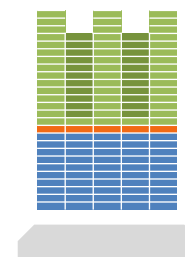
Natural &
Organic (& sand)
Infills



- ✓ 40 mm – 45 mm pile length
- ✓ Lower pile height organic / alternative infills
- ✓ Increased yarn density with texturised thatch, supporting infill & shockpad

3 REMOVE

High-performing
Non-infill Solutions



- ✓ < 40 mm pile length
- ✓ Very high yarn density using varied yarn configurations and texturised thatch
- ✓ No infill



Turf Systems - Carpet

- ▶ Aim to reduce quantity of infill and its ability to migrate into the environment
 - Lower pile > less infill & compaction
 - Denser carpet > less infill mobility
 - Yarn combinations > better infill retention and reduction in splash
 - Woven and double tufted construction (DT or MX) > less compaction and migration



GREENFIELDS ECO-RANGE **B** Entry range with straight tufted pitches

EVOLUTION PRO -s NATURE THE ECONOMICAL CHOICE



ECO HIGHLIGHTS

- NO INTENTIONALLY ADDED MICROPLASTICS
- BIO-SOURCED NATURAL CORK INFILL
- LOWEST MATERIAL FOOTPRINT IN THE RANGE
- PRODUCTION WASTE RE-USED IN THE YARNS
- 100% RECYCLABLE INTO RTA

GOOD

SLIDE MAX PRO -s BIOBLEND TRUSTED QUALITY

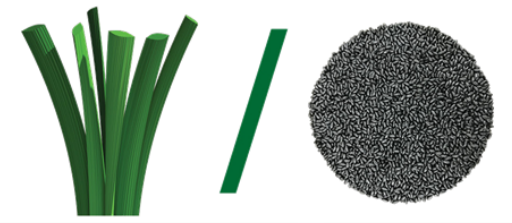


ECO HIGHLIGHTS

- NO INTENTIONALLY ADDED MICROPLASTICS
- BIO-SOURCED NATURAL MIXED INFILL
- TRUSTED SLIDE MAX PRO QUALITY
- PRODUCTION WASTE RE-USED IN THE YARNS
- 100% RECYCLABLE INTO RTA

BETTER

SLIDE MAX ELITE -s GREENFILL OUR HEAVY WEIGHT



ECO HIGHLIGHTS

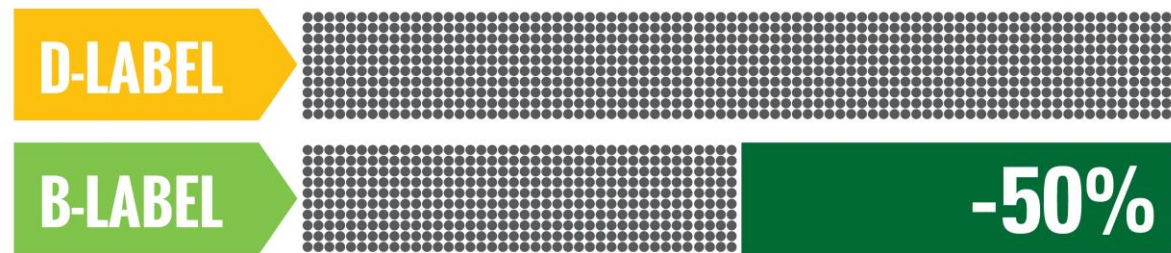
- NO INTENTIONALLY ADDED MICROPLASTICS
- BIO-DEGRADABLE POLYMERIC INFILL
- HEAVY DUTY SLIDE MAX ELITE YARNS
- PRODUCTION WASTE RE-USED IN THE YARNS
- 100% RECYCLABLE INTO RTA

BEST

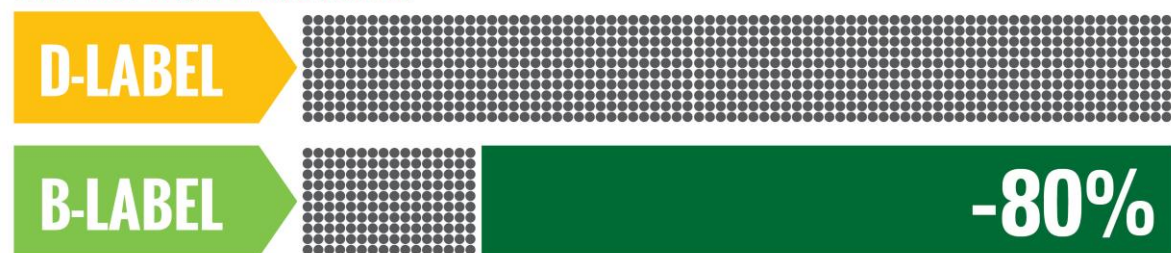


D-Label vs B-label

INFILL AMOUNT PER SYSTEM



INFILL SPLASH PER SYSTEM





GREENFIELDS ECO-RANGE **A** Premium range with fibre combinations

MF ELITE - s NATURE
THE LOW MAINTENANCE SOLUTION



ECO
HIGHLIGHTS



NO INTENTIONALLY ADDED MICROPLASTICS
BIO-SOURCED NATURAL CORK INFILL



HEAVY DUTY SLIDE MAX ELITE YARNS
FIBRILLATED TAPE CONTAINS THE INFILL
100% RECYCLABLE INTO RTA

GOOD

SLIDE MAX ST - s BIOBLEND
THE SEMI FILLED SYSTEM



ECO
HIGHLIGHTS



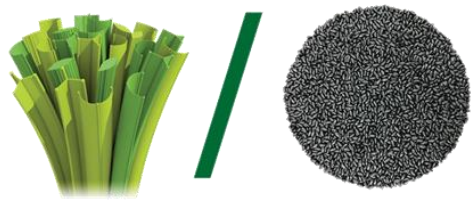
NO INTENTIONALLY ADDED MICROPLASTICS
BIO-SOURCED NATURAL MIXED INFILL



TRUSTED SLIDE MAX PRO QUALITY
TEXTURIZED YARNS KEEP THE INFILL OPEN AND CONTAINED
100% RECYCLABLE INTO RTA

BETTER

MX ELITE - s GREENFILL
OUR PREMIUM WOVEN SYSTEM



ECO
HIGHLIGHTS



NO INTENTIONALLY ADDED MICROPLASTICS
BIO-DEGRADABLE POLYMERIC INFILL



PATENTED WOVEN STRUCTURE CONTAINS THE INFILL
RECYCLING IN DESIGN: SINGLE POLYMER FAMILY
REDUCED CARBON FOOT-PRINT IN PRODUCTION

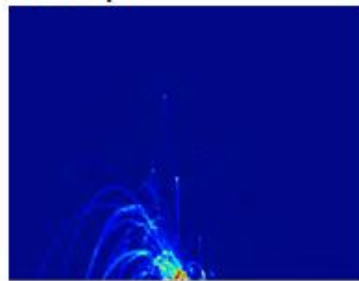
BEST



Maximum splash

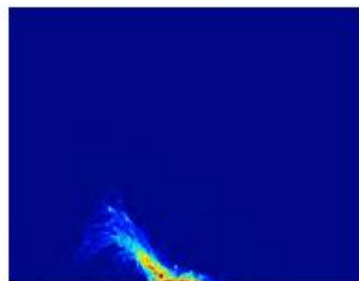
Heat map

B-LABEL
SLIDE MAX PRO
50 150



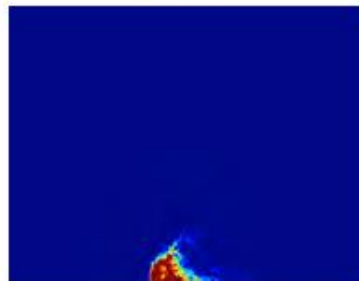
A-LABEL
MF ELITE
50 115

 FIG RILLATED TAPE
CONTAINS THE
INFILL



A-LABEL
MX ELITE

 PATENTED WOVEN
STRUCTURE
CONTAINS THE
INFILL

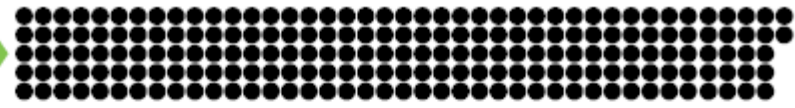


A-LABEL
SLIDE MAX ST
40 160

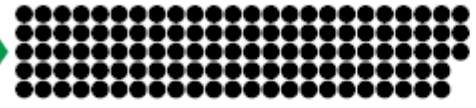
 TEXTURISED YARNS
KEEP THE INFILL
OPEN AND
CONTAINED



B-LABEL
SLIDE MAX PRO

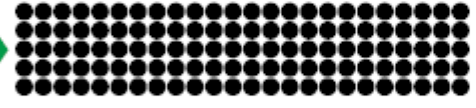


A-LABEL
MF ELITE



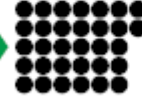
-41%

A-LABEL
MX ELITE



-41%

A-LABEL
SLIDE MAX ST



-84%





GREENFIELDS ECO-RANGE **A+**

Next generation non-filled systems

SLIDE MAX PRO NF - COARSE SAND
OUR ENTRY NON-FILLED SYSTEM



ECO HIGHLIGHTS

- NO INTENTIONALLY ADDED MICROPLASTICS
- EASIER TO INSTALL AND MAINTAIN
- TRUSTED SLIDE MAX PRO QUALITY
- NO INFILL SPLASHES OR POLLUTION
- 100% RECYCLABLE INTO RTA

GOOD

MX NF - COARSE SAND
OUR PREMIUM NON-FILLED SYSTEM



ECO HIGHLIGHTS

- NO INTENTIONALLY ADDED MICROPLASTICS
- EASIER TO INSTALL AND MAINTAIN
- RECYCLING IN DESIGN: SINGLE POLYMER FAMILY
- NO INFILL SPLASHES OR POLLUTION
- REDUCED CARBON FOOT-PRINT IN PRODUCTION

BETTER

MX NF - ECOCEPT
THE ULTIMATE SOLUTION



ECO HIGHLIGHTS

- NO INTENTIONALLY ADDED MICROPLASTICS
- NO INFILL SPLASHES OR POLLUTION
- RECYCLING IN DESIGN: SINGLE POLYMER FAMILY
- REDUCED CARBON FOOT-PRINT FROM PRODUCTION AND INSTALLATION
- BASE LAYER FROM 87% RECYCLED TURF

BEST

Centre for Turf Innovation – why is it needed?

- Historically turf system design has not paid enough attention to the athlete / user
- Focus of specification 'x' vs 'y'!
- The missing part is 'how does the specification and system design relate to athlete / user experience'
- Lots of arguments / debate about the design of turf systems historically but not much in the way of objective scientific evidence





Centre for Turf Innovation

- Research, development and innovation for turf systems using cutting edge world leading technology
- Improve our understanding of turf systems using innovative methods focusing on the players' experiences
- Development of new systems to meet and exceed the requirements of the player, the sport and the facility owner
- Integration of novel materials and production methods to improve performance, longevity and sustainability of turf systems
- Design more sustainable systems without needing to compromise on athletic performance, price or longevity



CTI – System Evaluation - Player Feedback

User Surface Interface

The users interaction with the surface including a range of parameters that can be categorised into:

1. **Grip** (e.g. friction, traction, slip, purchase, stability, confidence)
2. **Comfort** (e.g. skin friction, burn, abrasion, slide)
3. **Stiffness** (e.g. hard, soft, foot stability)

User
Surface

Turf
System



Ball
Surface

Ball Surface Interface

The interaction between the ball and the surface including a range of parameters that can be categorised into:

1. **Speed** (e.g. roll speed, fast, slow)
2. **Rebound** (e.g. bounce, height, low, dead)
3. **Predictability** (e.g. trueness, consistency, spin, control, directionality)

Surface
Experience

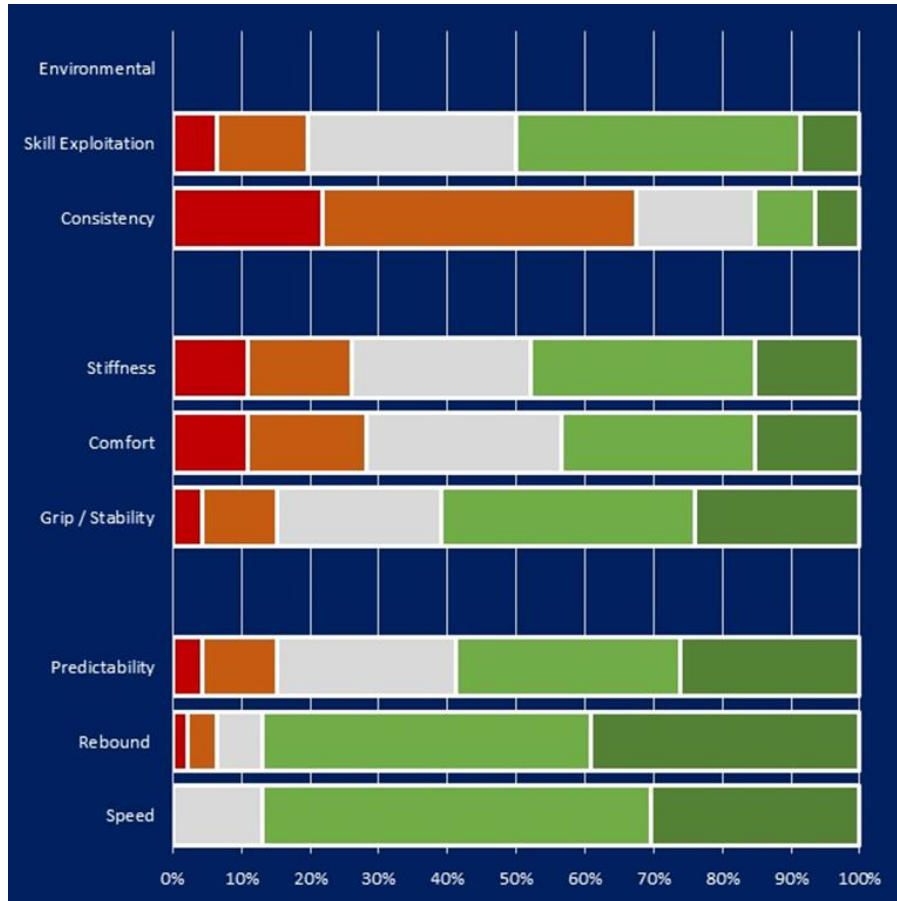
Surface Experience

Factors impacting the experience of playing on the surface:

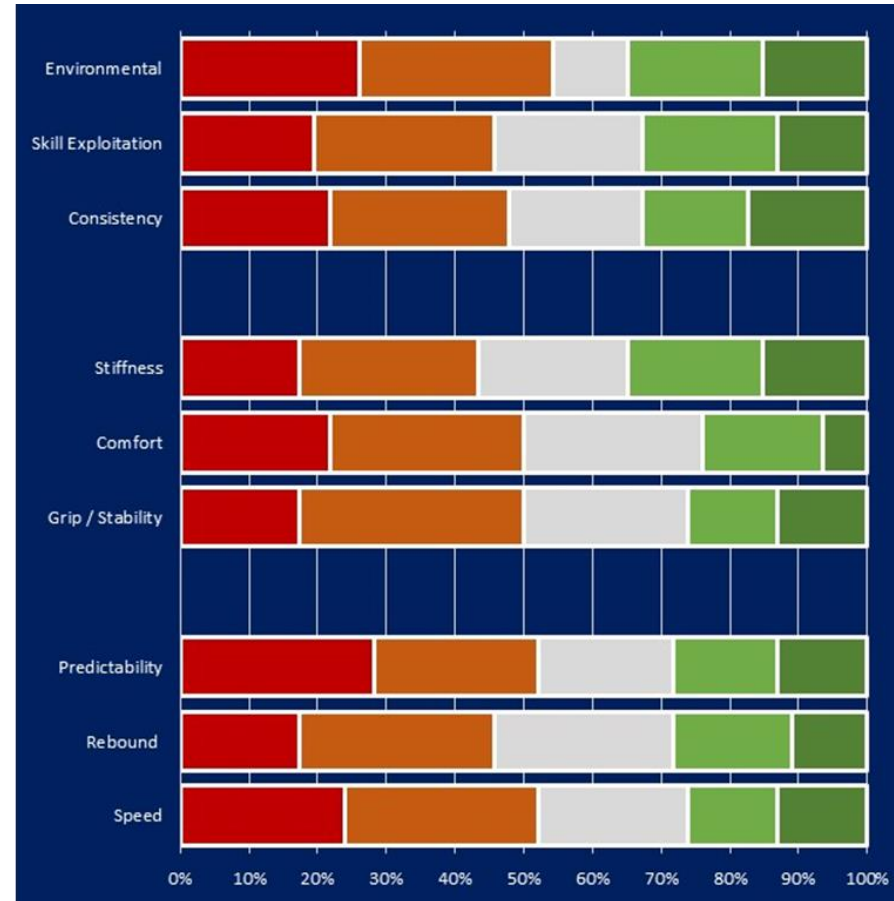
1. **Consistency** (e.g. predictability, uniformity, trueness, repeatable)
2. **Skill Exploitation** (e.g. undertaken skills, demonstrate ability,)
3. **Environmental Impact** (e.g. same in all conditions, no freezing, heat impact)

CTI – System Evaluation - Player Feedback

Non-Filled to Natural Grass



Filled Systems to natural Grass





Turf System – What is a non-filled turf system?

- This seems a rather strange question... the answer should be obvious but unfortunately it is not.
- Over the past several years people in the industry have come to describe turf systems with the absence of 'performance' infill as non-filled even if they contain stabilising infill.
- The contribution of the infill within a system will normally have both a stabilising and performance aspect and the terminology is no longer fit for purpose.
- **Non-filled turf system have no infill** they only contain yarns above the backing layers.
- Systems with even the smallest amount of sand are considered 'stabilising' or 'mineral' infill systems and they should not be classified as non-filled. **At GreenFields we should be clear and lead the way with this classification.**



Turf System – Non-Filled Turf

- Non-filled turf systems are an alternative option to organic filled turf systems
- Not yet adopted by international sports bodies (FIFA) – ongoing research
- Can providing many benefits including but not limited to;
 - High yarn density using varied yarn configurations, texturised thatch, and removal of infill creates a durable product
 - Quicker installation times
 - Lower operating costs
 - Reduced field maintenance requirements
 - Improved recyclability due to reduction in system components
 - Improved total cost of ownership when compared to organic filled solutions



GreenFields PUREPT

GEEN INFILL - EXTREEM DUURZAAM - ULTIEME PRESTATIES - ONTWIKKELD VOOR VOETBAL

GREENFIELD PURE PT

GreenFields Pure PT is a 100% non-infill product for soccer that delivers high player comfort and durability in addition to ultimate performance.

GreenFields Pure PT is not only a game changer within artificial turf for soccer but also a very responsible choice.



KEY BENEFITS

- 💧 Combination of fibre density, shape and length of the yarns guarantees a more durable product with an extended lifespan
- 💧 A true non-infill product - lower operating costs combined with minimal field maintenance requirements results in a more environmentally friendly turf
- 💧 Developed with unique fibre combinations, the turf feels soft to the touch without compromising on player comfort and grip, and ball roll
- 💧 GreenFields Pure PT is designed to better match the properties of a natural, high-quality turf without the need for infill materials



DURABILITY

New Sample



3000 Cycles



6000 Cycles



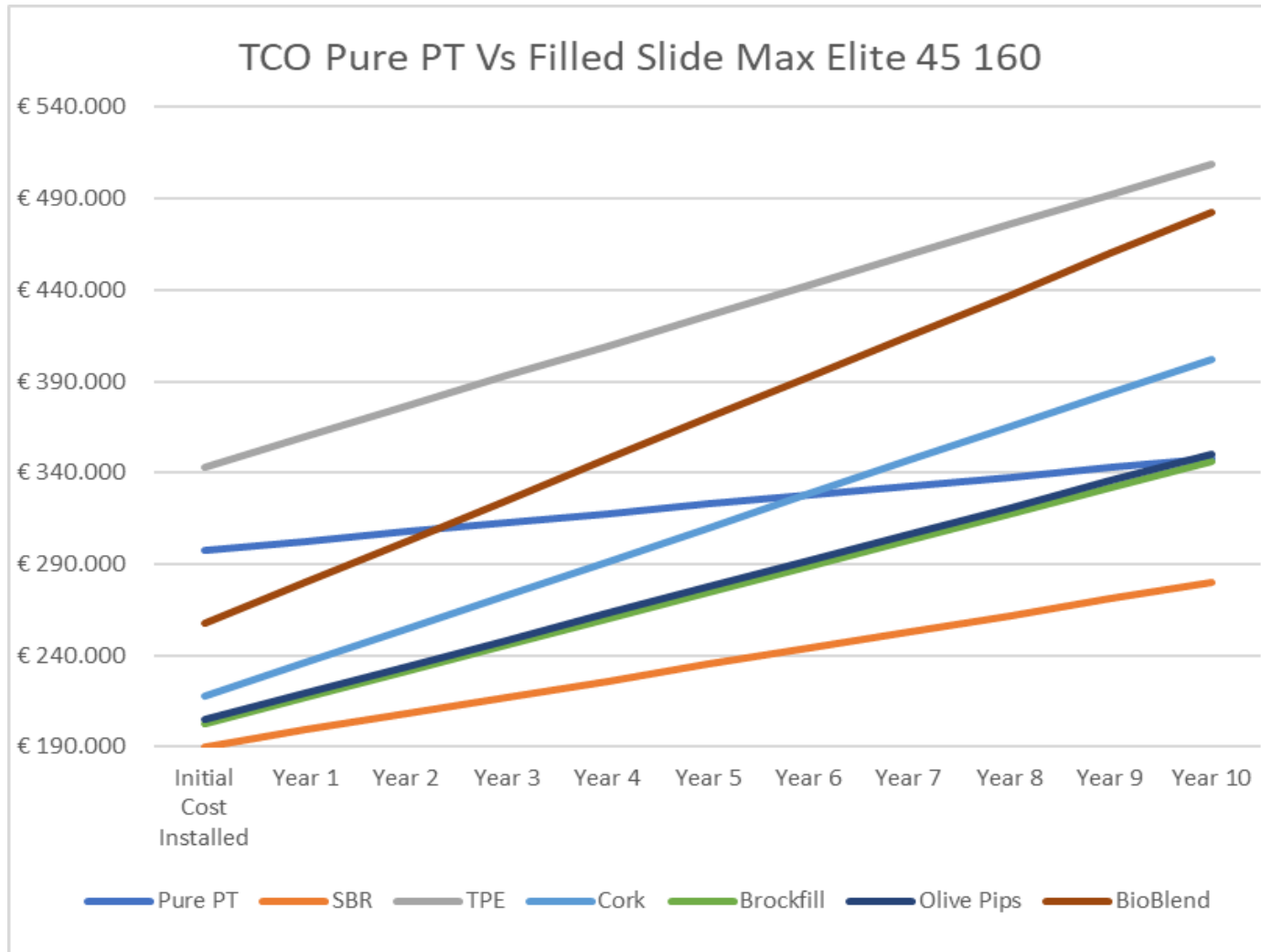


SUSTAINABILITY

- 💧 Designed to be a more durable product - an extended lifespan
- 💧 A true non-infill product
- 💧 No intentionally added microplastics
- 💧 Quicker installation time
- 💧 Lower operating and maintenance requirements and costs
- 💧 Reduced number of components – improved recyclability



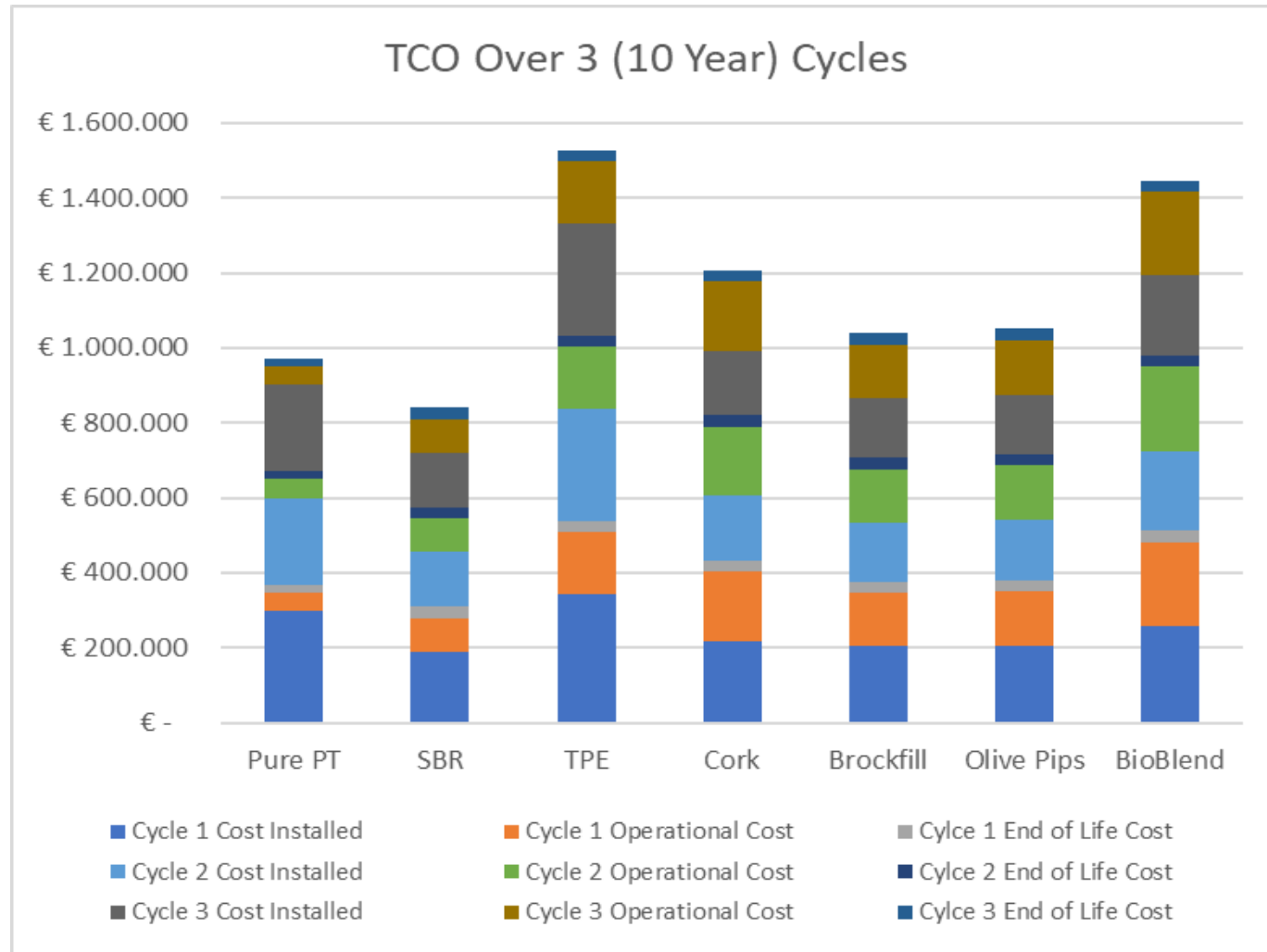
TOTAL COST OF OWNERSHIP



- 💧 Pure PT 6th initial installation cost
- 💧 By year 10 TCO on par with Brockfill and Olive Pips
- 💧 SBR option removed with legislative changes leaves Pure PT a favourable option
- 💧 Expect Pure PT to have an extended life over organic filled pitches



TOTAL COST OF OWNERSHIP



- 💧 SBR option removed with legislative changes leaves Pure PT most cost effective option in the long term
- 💧 Expect Pure PT to have an extended life over organic filled pitches meaning in credit after 30 years by approx. 6 years





PLAYER SURFACE INTERACTIONS



PLAYER SURFACE INTERACTIONS



PLAYER SURFACE INTERACTIONS



PILOT - PSV



VOETBAL



GEEN INFILL – EXTREEM DUURZAAM - ULTIEME PRESTATIES



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