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November 1, 2023

Mr. Joaquin Arellano
Special Projects and Administrative Manager
City of Hollywood
Parks and Recreation and Cultural Arts
Via e-mail: JARELLANO@hollywoodfl.org

RE: BOGGS EAST SYNTHETIC TURF PROJECT
FOLLOW-UP TO INFORMATION REQUEST

Dear Mr. Arellano:

We thank you very much for the opportunity to work with you on this project. We understand the importance of this project to the Hollywood community and we share in your commitment to provide the finest field possible. We competitively-priced our bid accordingly and applaud you for including safety and performance specs such as the use of a shock pad, g-max requirements, durable synthetic turf and temperature reducing infill.

We received your information request and are pleased to respectfully submit this response

- Sub-base
- Temperature reducing infill
- Shock absorbent pad
- Synthetic turf
- Max G-rating

Scope of Work - CONFIRMED

Act Global hereby confirms that it has reviewed the scope of work from the bid specifications and that our bid is based upon meeting or exceeding all requirements including the scope of work. To avoid doubt, this includes:

- General - Project includes but not limited to furnishing all labor, materials, equipment, and incidentals required to remove existing sod and install a synthetic turf football field at Boggs East Sport Field in a competent and professional manner and in compliance with all applicable safety and technical related codes and laws.
- The area to be renovated is an active park utilized for youth tackle football.
- Contractor must leave an accessible pathway to the field.
- The approximate synthetic turf area is 1.99 acres / 86,625 sq. ft.

- Synthetic turf shall be installed from existing perimeter fence line on the East, West & South side and 2 ft. from Royal Palm tree line on the north side. (Please attachment "A" for diagram)
- There is limited on site storage for equipment. The site has an active alleyway that cannot be blocked. The temporary onsite location of stockpiled materials must be mutually agreed upon by the City and Contractor prior to any placement.
- The site has existing irrigation and field lighting. The contractor will be responsible for locating and repairing any damage to irrigation or electrical lines.
- Remove and dispose of the needed amount of existing sod and/or dirt.
- Cut and cap existing irrigation.
- Install concrete perimeter and adhesive boards.
- Install pipe and drainage system as needed and to fulfill the requirements of the Surface Water Management Permit.
- Lay needed amount of base rock and compact.
- Lay needed amount of surface rock and compact.
- Lay needed amount of top sand if necessary.
- Grade to assist drainage as needed and to fulfill the requirements of the Surface Water Management Permit.
- Install shock absorbent base pad.
- Lay turf onto the base and position it where needed.
- Fasten and secure all turf rolls, inseams, and borders.
- Inlaid white lines that meet the exact specification used by National Federation of State High School Association (NFHS) football layout on a standard 240' x 120' 7 v 7 flag football (yellow).
- Apply temperature reducing infill. Spread infill to ensure no visible piles and clumps.
- Groom the blades and provide the City of Hollywood with a new synthetic turf field groomer. Must include a multi-year service plan that features 2 site visits annually.
- Include a warranty that, at minimum, matches the length or the term of the service plan.
- Include removal, furnish and install of football goals posts that meet the exact specification used by National Federation of State High School Association (NFHS) football layout.
- Process all necessary property surveys including but not limited to Geotech and Site Surveys.

Information Requested

General

- Act Global delivers its player safety and performance turf through a process of R&D, manufacturing and turnkey, in-house installation services.
- The system specified uses the same raw materials and slit film as supplied to many clients especially US Bank Stadium, home of Minnesota Vikings
- The field will be constructed under the management of Mark Weightman, an ASBA Certified Field Builder
- Act Global has sold its synthetic turf in 90 countries and is a subsidiary of the $2.5 billion Beaulieu International Group.

Player Safety and G-Max Ratings

We start with understanding injury rates and natural grass benchmarks. This includes testing:

- ✓ Natural grass fields for baseball (Houston Astros and NY Yankees spring training fields), football (NFL natural grass and Texas A&M Kyle Field) and soccer (FIFA testing).
- ✓ Performance for shock absorption, traction, foot stability, skin abrasion and ball interaction for baseball (splash, ball speed) and soccer (ball roll and bounce).
- ✓ Factors for fatigue, concussion and lower extremity risks.
- ✓ Environmental stewardship and infill that meets European Toy Standards, ASTM and Synthetic Turf Council Guidelines.

Based upon our system design and upgrade to a 17mm pad instead of a 14mm pad, the gmax will be below 100 at installation and guaranteed to be below 125 for up to 10 years with sufficient maintenance practices.

Sub Base

The base will be in compliance with the bid and a vertical draining field base consisting of a four-inch layer Open Graded Stone (OGS) and a two-inch layer of finish aggregate with a panel under a drain system installed upon a geotextile membrane. The panel drain is connected directly into a properly sized perimeter collector drain, which discharges into a designated storm water outlet.

More specifically the 6=inch base includes:

- 4" depth of #57 stone = 2,271 tons
- 2" depth of #89 stone = 1,174 tons
- Rock aggregates supplied by: Austin Tuppler Trucking with specifications per the attached sieve report from Cemex quarry
- Geotextile: Mirafi 140N - 10,587 SY
- 12" perimeter drains 1,300 LF
- Flat drains 3,638 LF
- Geo and drainage pipe sourced from Kinder Brother Supply
- Concrete Curb: 2"x6" curb 1,238 LF

Temperature reducing infill

- 4 lbs per sf sand on bottom of turf
  - Supplied by industry leading supplier Target technologies International Inc
  - 20/40 sieve size per industry norms
  - Sand specified for synthetic turf fields
  - Total of 340,301 lbs of sand
- 1 lb per sf of Brockfill
  - Temperature reducing organic infill
  - Total of 86,625 lbs of Brockfill
  - BrockFill comes with a Performance Guarantee to meet the performance criteria of the One Turf Concept at installation. The One Turf Concept is supported by FIFA and includes

many of the same tests I presented last Friday. **One Turf Concept testing includes vertical deformation, rotational resistance, shock absorption, ball rebound, ball roll, infill depths, and HIC (head injury criterion)**
  - BrockFill compacts less than coconut-based infills which is important for surface hardness (Infill Compaction Report by SportsLabs available upon request)
  - Significant temperature reduction – 20-30 degrees cooler than fields with rubber when dry, up to 50+ degrees cooler than fields with rubber when wet
  - Made in the USA

Shock absorbent pad

- Brock SP17XL shock pad
- Includes g-max guarantee for 10 years to not exceed 125 subject to standard warranty provisions
- See attached information
- 86,625 sf of Brock Pad
- Fully recyclable and cradle-to-cradle credentials

Synthetic turf

- Act Global™ F50 slit-film synthetic turf system
- Manufactured by Act Global's ISO 9001 Quality Certified Plant in Calhoun, Georgia
- Approximately 86,625sf plus waste factors
  - 2" (50 mm) tall pile fiber height
  - 42 oz/sy face weight (grass yarn)
  - Polyethylene with exclusive 110 micron slit film – same materials used in high profile installations such as US Bank Stadium (home of Minnesota Vikings)
  - 1/2" tufting gauge
  - 7 oz/sy primary back (13+) and 20 oz/sy polyurethane secondary backing
  - One 2-hour training session of Owner personnel on maintenance

We thank you again for the opportunity! Please contact Candice Robb at (330) 388-7814 or crobb@actglobal.com or John Baize at 512-825-0852 if you have any questions or require additional data, product specifications, samples or literature related to this proposal.

Sincerely,

John Baize
CEO

Mark Weightman, MBA
Vice President

CFB-S
AMERICAN SPORTS BUILDERS ASSOCIATION
CERTIFIED FIELD BUILDER - Synthetic Turf

XtremeTurf™ F

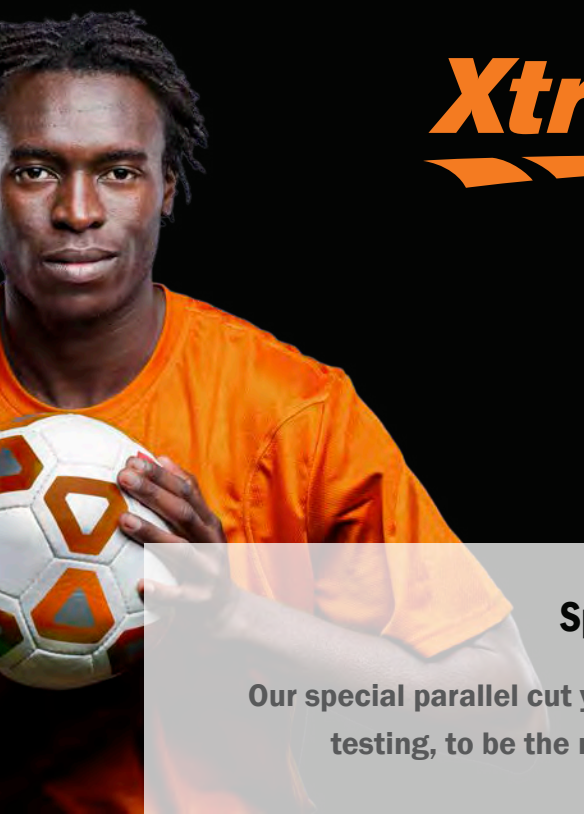
Raising the bar for DURABILITY.

Presenting the most resilient fibrillated synthetic turf on the market.

MOST DURABLE
FB GLOBAL FIBER

Durability and field longevity are key concerns when considering artificial sports surfaces and maximizing value for field owners. *Xtreme Turf F* featuring the advanced FB Global™ yarns pushes the boundaries of durability, exceeding the Lisport testing of any other yarn on the market.

Although incredibly durable, *Xtreme Turf F* does not sacrifice player comfort. The innovative design resists degradation and splitting, while offering optimal performance, skin-friendliness and natural grass like appearance. This winning combination means *Xtreme Turf F* is an exceptional choice for high intensity indoor and outdoor sports field use.



XtremeTurf™ F

SPORT APPLICATIONS

Special Parallel Cut (FB Global)

Our special parallel cut yarn, FB Global, is proven, through extensive independent testing, to be the most durable fibrillated yarn product on the market.

Our FB Global Fiber Offers Xtreme Durability

UNRIVALED DURABILITY

- ✔ Ideal for high-intensity use
- ✔ Advanced UV stabilizers
- ✔ Maximize return on investment

PLAYER PERFORMANCE

- ✔ Ideal traction and foot stability
- ✔ Optimal ball behavior
- ✔ Low abrasion for player safety and comfort

RESEMBLES NATURE

- ✔ Natural appearance
- ✔ Looks great both indoor and outdoor

BETTER INFILL ENCAPSULATION

- ✔ Provides a stable and reliable playing surface
- ✔ Fibrillated yarn ensures infill material is encapsulated

XtremeTurf™ F50

Xtreme Turf is found in over 2,000 installations in over 90 countries. The system is installed over a suitable substrate in accordance with designs and specifications recommended by Act Global.

PRODUCT SPECIFICATIONS

CHARACTERISTICS	SPECIFICATIONS
YARN	Polyethylene with Exclusive 110 Micron Slit Film
FILM TYPE	FB Global (Slit Film)
PILE WEIGHT	42 oz/sy
DENIER	10,000 FB (Slit Film)
PRIMARY BACKING WEIGHT	7 oz/sy
SECONDARY BACKING WEIGHT	20 oz/sy
TOTAL WEIGHT	69 oz/sy
PILE HEIGHT	2” or 50 mm
TUFTING GAUGE	1/2”
PRIMARY BACKING	Multi-Layer
SECONDARY BACKING	Polyurethane Coating
WIDTH	15’
PERFORATION	Yes
SHOCK PAD	Brock SP17XL
INFILL	4 lbs:1 lbs Sand & BrockFill - Recommended 75% or greater of the pile height

*These are typical specifications, subject to standard manufacturing tolerances and customer options
Boggs East Sport Field

FEC Quarry-FDOT #87090
13292 NW 118th Ave
Miami, Fl 33178
305-818-2909

Product Quality Summary Report

Tuppler

Period 08/01/2023 - 11/01/2023

Plant	1328 FEC Quarry-FDOT #87090	1328 FEC Quarry-FDOT #87090
Product	1036898 ASTM #57 FDOT Code10	1159424 ASTM #89 Cert for FDOT Code17
Specification	ASTM #57 FDOT 10	FLDOT 89
1 1/2" (37.5mm)	100.0	
1" (25mm)	99.9	
3/4" (19mm)	82.4	
1/2" (12.5mm)	35.5	100.0
3/8" (9.5mm)	18.2	97.8
5/16" (8mm)		85.6
#4 (4.75mm)	3.3	35.9
#5 (4mm)		23.0
#8 (2.36mm)	1.9	5.6
#10 (2mm)		3.5
#16 (1.18mm)		1.8
#30 (.6mm)		1.2
#40 (.425mm)		1.1
#50 (.3mm)		1.0
#80 (.18mm)		0.8
#200 (75µm)		0.97
Pan	0.00	0.00
LA Abrasion (B,500)	33	
LA Abrasion (C,500)		32
-#200 (75um)	1.05	0.98
Absorption	5.5	5.6
SPGR (Dry,Gsb)	2.335	2.334
SPGR (SSD)	2.464	2.464
SPGR (Apparent,Gsa)	2.681	2.684

FEC Quarry-FDOT #87090
13292 NW 118th Ave
Miami, Fl 33178
305-818-2909

Product Quality Summary Report

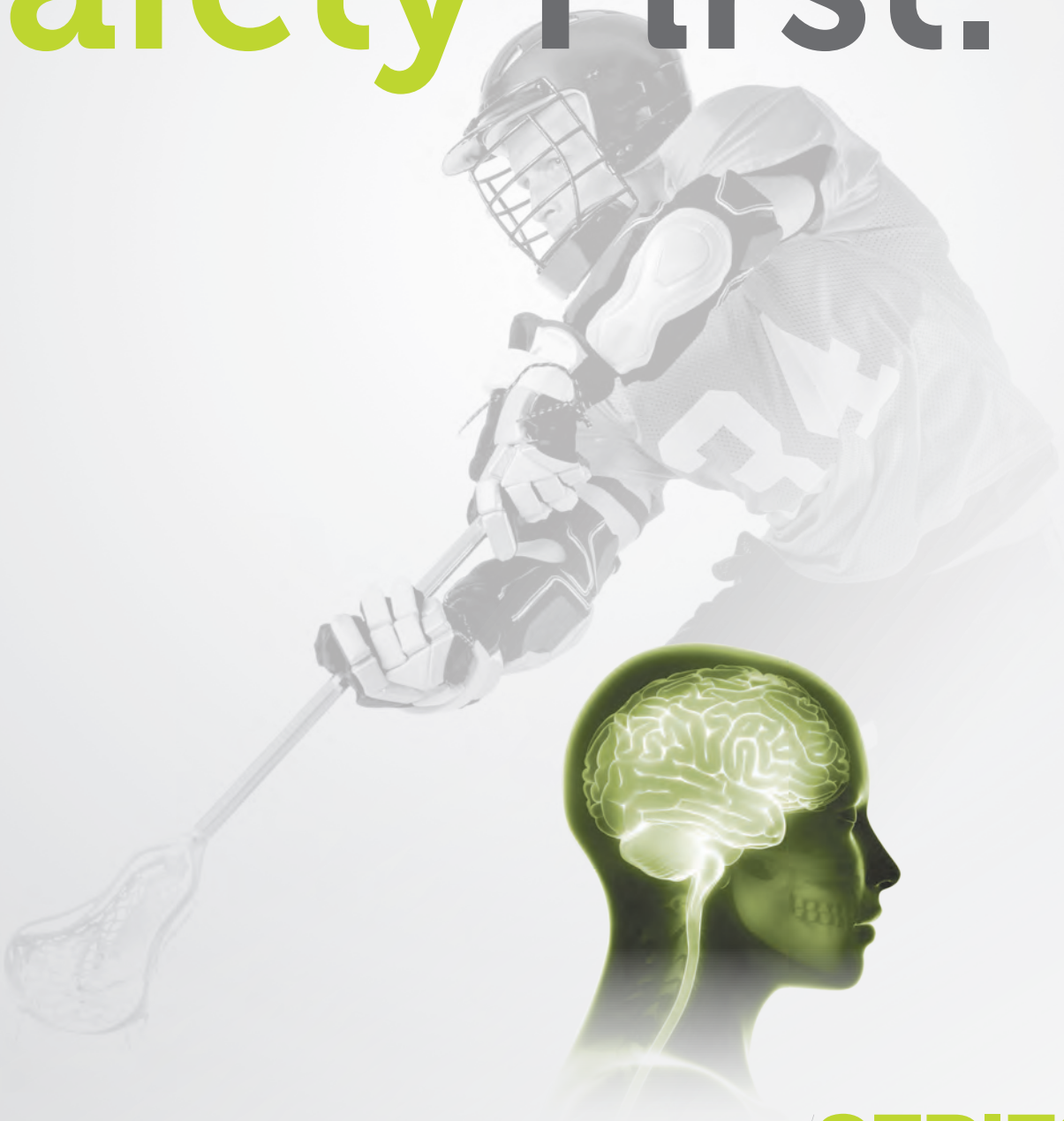
Tuppler

Period 08/01/2023 - 11/01/2023

Query

Query Selections
Date Created 11/01/2023
Date Range 08/01/2023 - 11/01/2023
Plant FEC Quarry-FDOT #87090
Sample Type Shipping

Safety First.



SHOCKPAD SERIES
BY BROCK

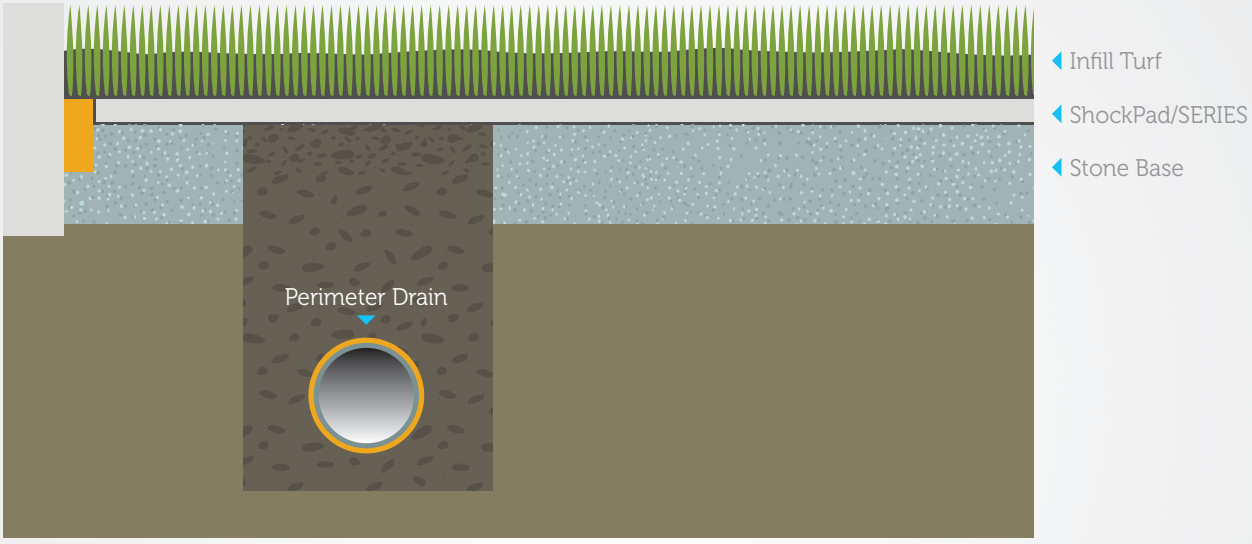
Benchmarking natural turf.

3 There are three measurements used to characterize safety and performance of a surface:

The Test	The Testing Device	The Goal
HIC (Head Impacts) **ASTM F355 E Missile** HIC is the internationally recognized test standard for head injuries. It drops a 10 lb hemispherical impacter from increasing heights to determine Critical Fall Height. It's the same test used in playgrounds, automotive crashes, wall padding, pole vault, and the WR Reg22 standard for artificial turf. The higher the Critical Fall Height, the more protective the surface is for head injuries.	1 	**1.7-2.3 m** **(5'7"-7'6" ft)** CRITICAL FALL HEIGHT
GMAX (Body Impacts) **ASTM F355 A Missile** This test method covers the measurement of certain shock-absorbing characteristics, like during body impacts. It's applicable to natural and artificial playing surface systems. It does not correlate to head injury. It drops a 20 lb flat missile from 24". GMax is a good measurement when used in conjunction with HIC above, but as a stand alone test is not a total measure of field safety.	2 	**71-115 G's** GMAX
VERTICAL DEFORMATION **(Firmness Under Foot)** **EN14809 Vertical Deformation** This test simulates the heel strike of an adult running athlete in stride. This is the softness or hardness under foot during play. A great natural grass field hits the "sweet spot" of being firm under foot while producing very low gmax and high Critical Fall Height. Which is why quality natural turf is the benchmark for quality artificial turf.	3 	**6-11 mm** VERTICAL DEFORMATION

The goal of any artificial turf surface is to mimic a high-quality, natural grass playing field. Achieving this requires a more sophisticated approach than laying "rug over rock". Think of Brock ShockPad/SERIES as the "intel inside" of your field.

The ShockPad/SERIES comes in several thicknesses, from 14mm to 20mm, depending on the turf you select, always keeping the performance of the overall system in mind. Fields that utilize a SP shock pad demonstrate the safety, speed and impact performance that replicates a quality natural turf surface; plus they drain fast and last longer.



SHOCKPAD/SERIES, SYNTHETIC TURF AND STONE BASE FOR STABLE SOILS – *Cross Section*

A shock pad for every turf.

SHOCKPAD/14

14 mm - great for new construction & turf replacements. Outperforms ProPlay 23D.

SHOCKPAD/17

17 mm - great for new construction & turf replacements with all infills. SP System for BrockFILL.

SHOCKPAD/20

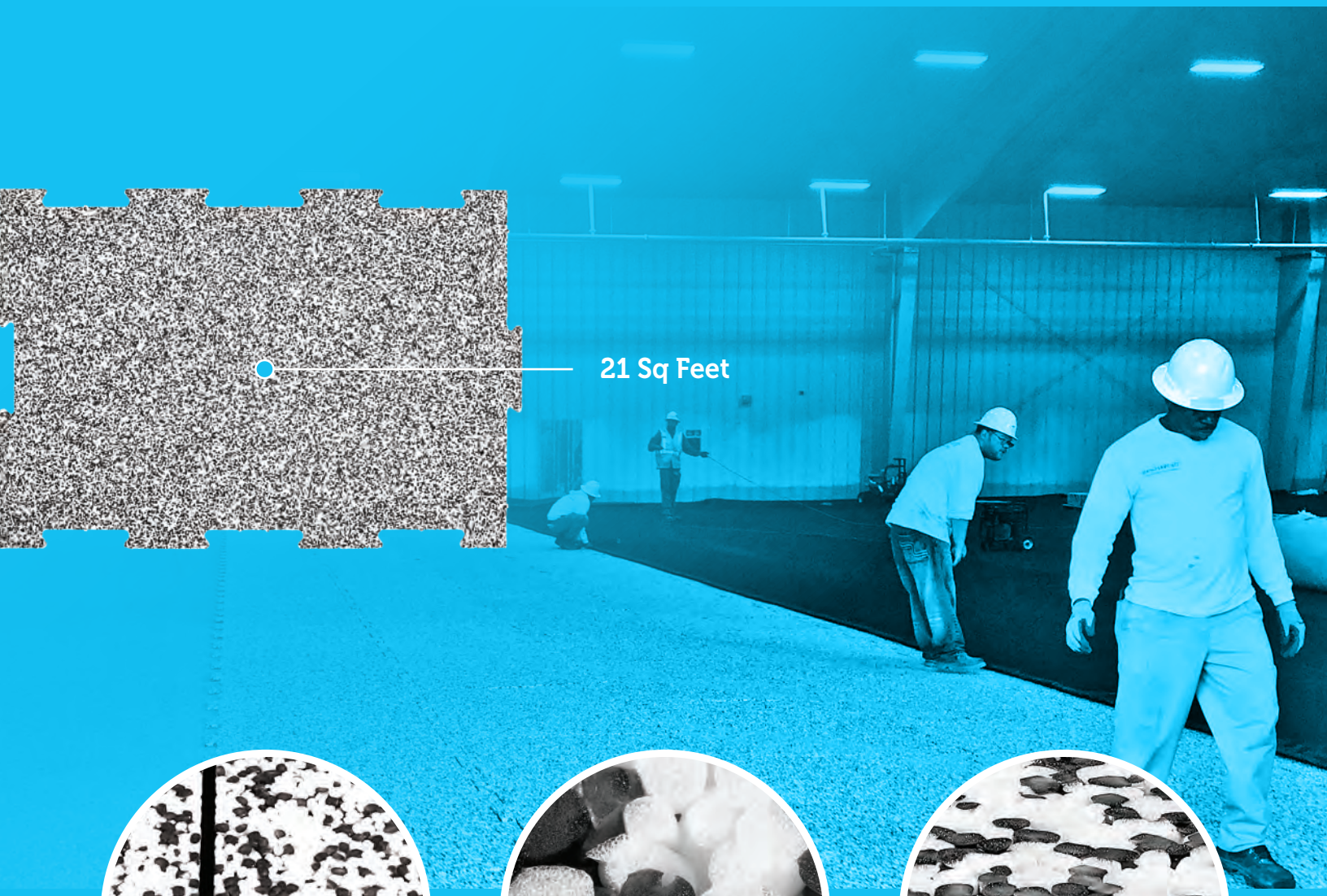
20 mm - highest performance. Used on all athletic fields with all infills and on playgrounds.

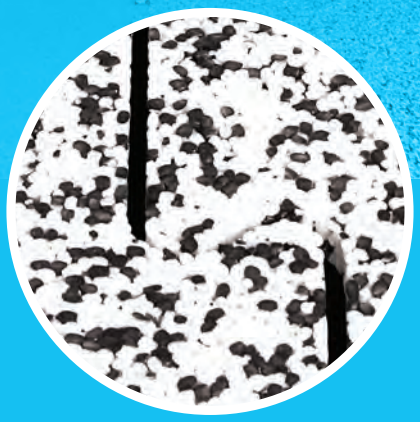
14 mm

17 mm

20 mm

The most proven Shock Pad on the market.





STABLE

Large robust dovetail interlock makes installation fast and easy.

POROUS

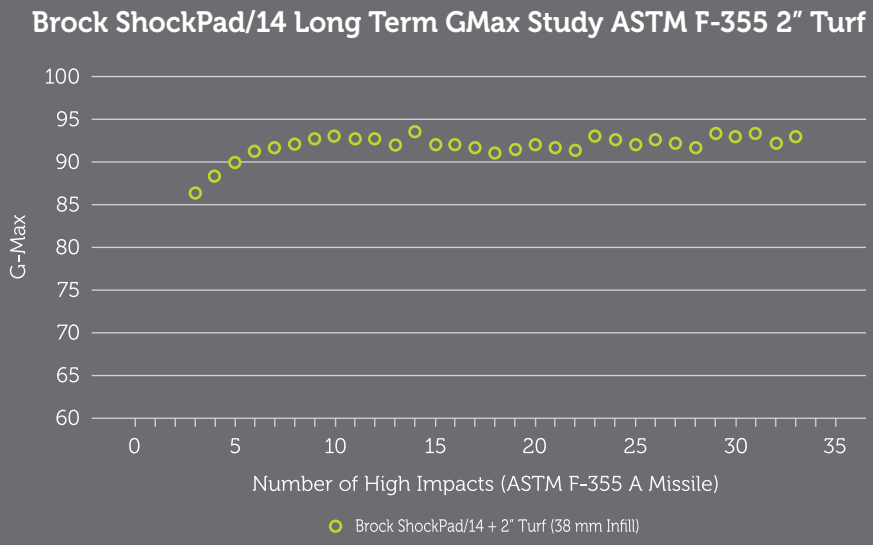
Open pore structure allows water to pass vertically through material.

DYNAMIC

Interaction of particles keeps field stiff for running, soft for impacts.

Low GMax for the life of your field.

Our goal was simple: A great natural grass field will produce a GMax of around 90-100 Gs and be firm and fast to play on. A synthetic turf over ShockPad/SERIES will do the same thing, and maintain it for the life of the field. Testing shows how even after years of high impacts *in the same location* the GMax is low and consistent.



16 YEAR WARRANTY

When you replace your turf, the Shock Pad is reused for the next turf life.

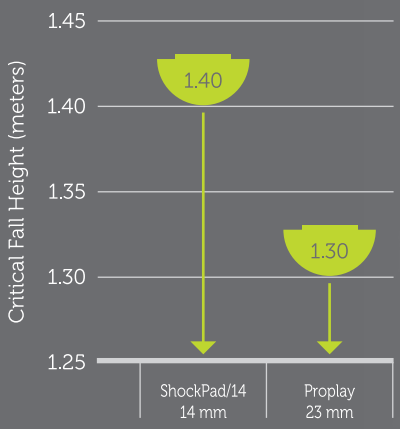
Use Brock SP Series when:

1. Replacing an old, hard synthetic turf field. Using a shorter turf and SP results in better play and greater safety, doesn't change the field profile, and offsets some of the cost of the pad.

2. New synthetic fields designed with a draining stone base, where long term safety is required. Again, we recommend a slightly shorter turf over SP. The thickness of the SP is determined by the turf you select. The shorter pile turf, the thicker the SP should be in order to attain the highest safety levels possible.

It's a work horse.

Brock's ShockPad series will outperform other "shock pads" nearly twice as thick. That's because it's engineered for artificial turf and the impact it will experience during play. A patented material using polypropylene with a microcoating binder produces a material with an open pore structure for fast drainage and a unique impact profile ideal for artificial turf.



ASTM F355 E Missile;
2" Turf, 65% Sand 35% Rubber,
Critical Fall Height
(Higher is Better)

Fast drainage.

Vertical permeability of ShockPad/17 is far greater than the turf itself, so as long as the stone base below and the turf above allows water to pass, Brock SP will only enhance drainage.

>700 in/hr
ShockPad/17 Pad

<50 in/hr
Synthetic Turf Only

BROCK®
FIRMER. FASTER. SAFER.

www.brockusa.com / 877-276-2587

US Patents: 8,236,392, 8,353,640 and D637318 and other patents pending.

The Natural Next Step.

BROCKFILL™
THE ENGINEERED INFILL FOR ATHLETES

It's Sourced from Softwood Tree Farming:
An Abundant, Renewable U.S. Resource.

1

A prolific species of trees are planted in high density on farmland across the southeastern US.

2

After 7-9 years, trees are thinned to allow the remaining trees to grow taller for higher end uses like lumber, furniture and telephone poles.

3

Thinned trees are then converted for the paper, animal bedding, and biofuels industries...and BrockFILL.

4

BrockFILL is manufactured through a proprietary process that removes splinters, buffs and rounds the particles, and sifts out dust. The process involves 12 different steps to achieve the ideal particle shape, size, and smooth surface.

5

BrockFILL is used as infill for the life of the turf. Providing a safe, high performing surface for all athletes.

6

BrockFILL returns to earth as soil amendment for natural turf fields, lawns, gardens, golf fairways, or landscape mulch without leachates that are harmful to water quality or human health.

BROCKFILL RECIPE: 1 lb BrockFILL, 4 lbs Sand, in a 2" Slit Film or Blended Turf over Brock ShockPad

Finally, a true replacement for crumb rubber infill.

Since 2004, Brock has led the industry in research about athlete safety and the environmental impacts of artificial turf.

We were the first ones to achieve Cradle to Cradle environmental certification for our base systems, the first to offer a 25-year warranty, the first to hold national educational forums for designers and scientists, and the first (and still only) to achieve the higher head protection safety levels of pristine natural turf.

It has been proven in many player studies that athletes prefer natural turf to artificial. Those same studies show that artificial turf fields that use shock pads are universally preferred over those that do not – *so the least preferred system by athletes is artificial turf directly over stone*. Additionally, 1-in-5 concussions happen when the head hits the surface and lower leg injuries are higher on conventional artificial turf than on natural grass. All this has led to a paradigm shift in thinking about artificial turf safety and why it is essential that it mimics well-groomed natural turf. It's what athletes want!

The challenge is to create a system that feels like natural turf and that means changing the one component athletes hate most: crumb rubber infill. It's too hot, it smells, it's too abrasive, it's unstable under foot and its end of life is an environmental tragedy. As global warming continues, climate change will make these surfaces literally too hot to play on.

Starting in 2015, the Brock team worked with a specialized group of universities, sports testing labs, PhD scientists, engineers, horticulturists, and several sports science experts to develop a solution to these problems. True to Brock form, we left no research question unanswered.

Now another first: A durable, cool, *affordable*, best-performance infill engineered for athletes. And it's organic. In a world that is getting too hot, it's time to cool off.

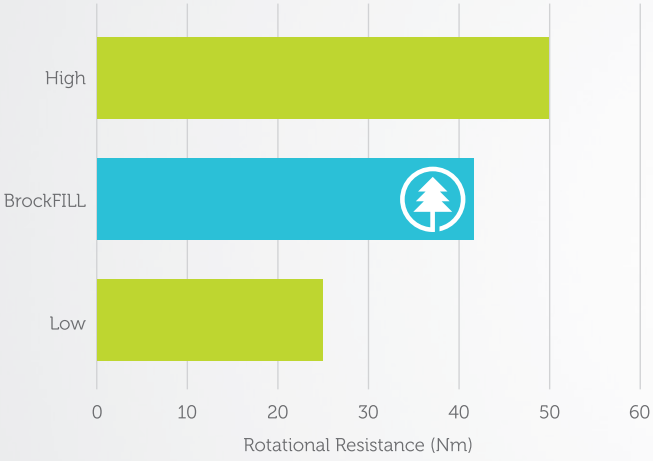
"It is a wonderful example of Man and Nature working together."

– Brian Jackson, PhD, NC State Department of Horticulture

Tested for... everything.

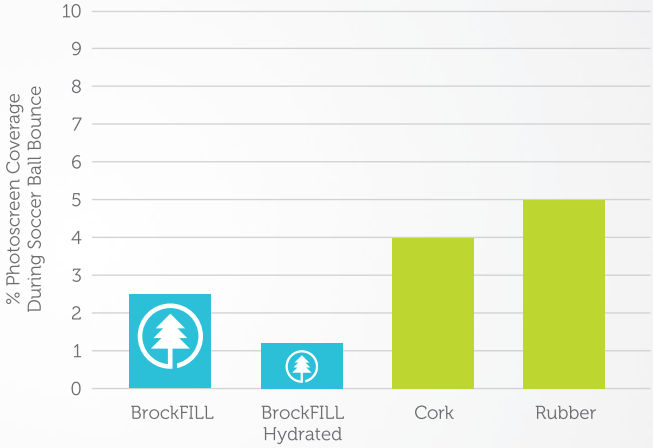
Traction

Humans evolved running on natural surfaces, not a rubberized bouncy turf that changes consistency across the field. BrockFILL feels like natural turf under foot and falls within the optimal traction range (FIFA 2-STAR) without the variability in energy restitution ("bounce") of crumb rubber.



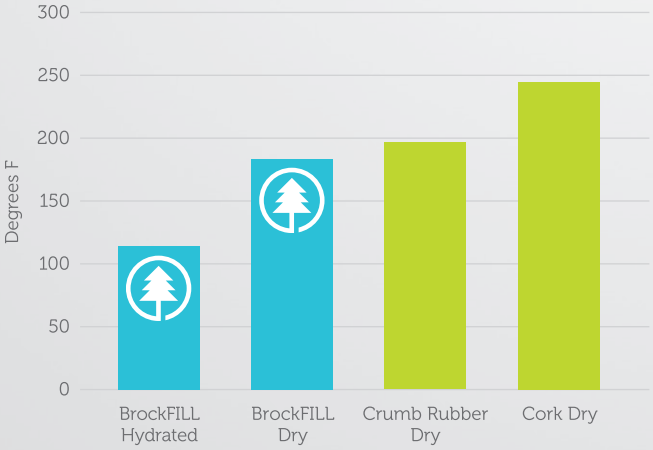
Splash

Keeping infill in the turf is key, so the lower the splash the better. BrockFILL achieves the lowest splash when dry compared to other infills and is even better when damp.



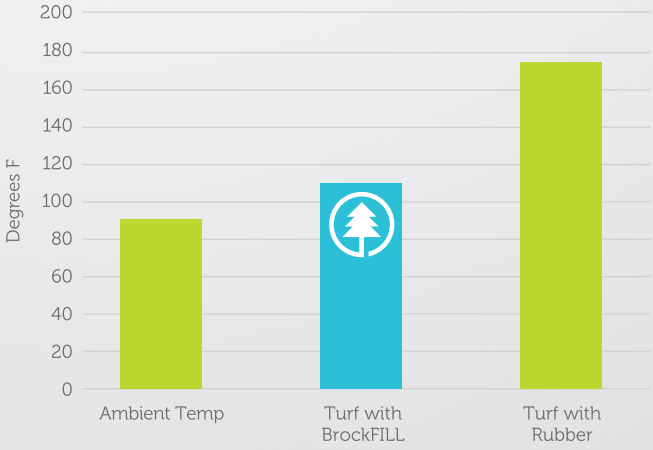
Abrasion

Besides field temperature, abrasion is the most common complaint from athletes about artificial turf. Independent testing from Labosport measures heat generated as a device slides across the turf sample using a mass and speed representative of a sliding athlete. BrockFILL generated the lowest heat score, therefore the lowest abrasion, of any infill, even crumb rubber. Better yet, abrasion is even lower when BrockFILL is damp.



Cooling

BrockFILL is a significantly cooler infill than crumb rubber and does not require watering. Each BrockFILL particle is naturally hydrophilic, so they absorb natural rainwater and condensation into their core, not just on the surface. Moisture is then released slowly for extended cooling. Plus BrockFILL gains weight when wet, so it doesn't float or migrate like cork.



Durability

BrockFILL is an extremely durable organic material. After 20,000 Lisport cycles, the particle dimensions remain virtually unchanged. Additionally, the particles improve over time! They get smoother, further lowering skin abrasion without breaking down.

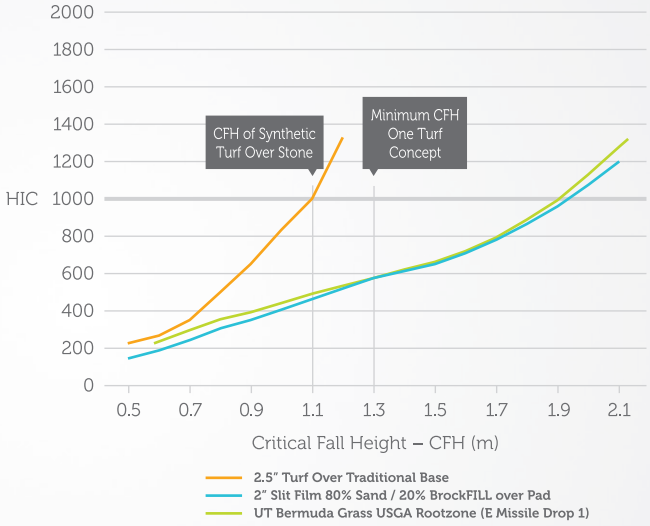
BrockFILL before Lisport test.

BrockFILL after 20,000 Lisport cycles.

* BrockFILL at 120x magnification.

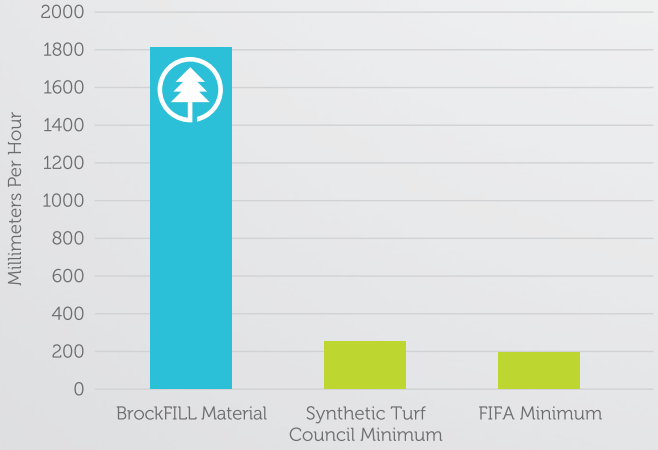
Player Safety

The BrockFILL system utilizes Brock shock pads to provide the optimal energy absorption and head injury protection, while remaining firm for running: something a rubber and sand field over stone cannot achieve.



Drainage

Like all Brock products, BrockFILL has higher permeability than the turf itself. When tested in turf, the system drains over 50" per hour. Even after 8 years of simulated use with zero maintenance, the field still meets the requirements of International drainage standard. (But you should still maintain your field!)



... and we mean everything.

- Head Impact Criteria
- Gmax Test
- Permeability in the System
- Shock Absorption
- Energy Restitution
- Rotational Resistance
- Vertical Deformation
- Ball Rebound / Angled Ball Rebound
- Ball Roll
- Flammability
- Ball Splash
- Temperature Testing
- Durability
- Density at Different Moisture Content Levels
- Permeability (material only)
- Total Pesticides
- Total Herbicides
- Leachable Pesticides
- Leachable Metals
- Total Metals
- Hexavalent Chromium
- Mold Growth
- Bacteria Growth
- Freeze-Thaw Cycle
- Insect Resistance
- UV Exposure
- Flotation
- Abrasion

* All test reports available.

The science is undeniable.

When infilled sand and crumb rubber systems were first introduced in the late 1990s they were a significant leap forward for artificial turf sports systems when compared to the original nylon turf. These systems have been used prolifically, but the shortcomings in the design, performance, environmental impact, and safety cannot be overlooked any longer. These systems, long touted as shock-pad free, do not provide the safe surface athletes deserve. They create foul smelling and dangerously hot environments leading to burns, blisters and heat exhaustion, and rubber can create an unnatural, "bouncy" feel which results in the instability that contributes to fatigue, joint stress and lower extremity injuries. The waste and disposal of crumb rubber has reached alarming levels. A typical athletic field is equivalent in size to a 500 car parking lot, and can reach temperatures of 175+ degrees. With the effects of global warming, **this has to stop**.

Years of research, testing, and studies have led to a superior playing surface. Twenty five years from its introduction, It's time for the crumb-rubber, turf-over-stone system to take its place in history and clear a path for the next generation system for athletes. One that is cooler, firmer, safer, and leaves no scars on the athlete, or the environment.

A typical athletic field is equivalent in size to a 500-car parking lot, and can reach temperatures of 175+ degrees.

The US Consumer Products Safety Commission suggests the use of WOOD and other materials rather than crumb rubber to create a shock-absorbing surface under public play areas.

There are plenty of better uses for waste tires, including road asphalt, Speed bumps, railway vibration absorption and more.

BROCK®
FIRMER. FASTER. SAFER.

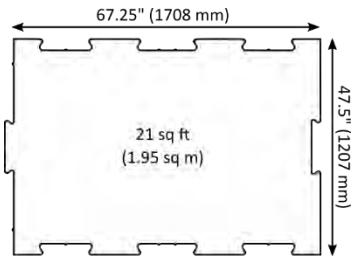
www.brockusa.com / 877-276-2587

US and International patents pending.

SHOCKPAD 17
BY BROCK

Typical Properties & Specification

Product Number	SP17XL
Material Type	Expanded polypropylene composite containing approximately 30% by volume reprocessed pre-consumer and/or post-consumer recycled material
Part Format	Interlocking panel
Part Size, nominal net coverage	21.0 sq. ft per panel (1.95 sq. m)
Part Thickness, nominal	0.67 in (17 mm)
Part Length, nominal	67.25 in (1708 mm)
Part Width, nominal	47.5 in (1207 mm)
Part Weight, nominal	4.3 lb per panel



Property (Shock Pad Only)	Typical Value	Specification	Test Method
Tensile Strength [1]	70 psi	> 45 psi	ASTM D3574 Test E
Tensile Elongation [1]	19%	> 10%	ASTM D3574 Test E
Compression Strength [2]			
@ 25% strain	33 psi	> 25 psi	ASTM D3575 Test D
@ 50% strain	51 psi	> 40 psi	
Compression Set [3]			
35 psi for 30 minutes – % set after 24 hr	5%	< 7%	Brock Test Method
Coefficient of Linear Thermal Expansion [4]			
per 1 °C change	0.06 mm/m	< 0.10 mm/m	ASTM D696
Water Absorption [5]			
After 24 hr immersion	3.3%	≤ 5%	DIN 53428
Water Permeability (Vertical Drainage) [5]	953 in/hr	> 500 in/hr	ASTM F1551: DIN 18-035, Part 6
Critical Fall Height (HIC = 1000) [5]	0.77 m	> 0.6 m	ASTM F3146, Procedure A
Gmax [5]	111 g	< 120 g	ASTM F355 (Missile A)
Shock Absorption [5]	61%	> 55%	ASTM F3189 (Adv. Artificial Athlete)
	64%	> 55%	EN 14808 (Artificial Athlete)
Vertical Deformation [5]	7.0 mm	< 8.0 mm	ASTM F3189 (Adv. Artificial Athlete)
	2.6 mm	< 4.0 mm	EN 14809 (Artificial Athlete)
Resistance to Chemicals [5]	No Change	≤ 2	ASTM F925
Microbiological Analysis			
bacteria resistance [6]	No growth	No growth	ASTM G22
fungi resistance [7]	No growth	No growth	ASTM G21
Environmental Standards Testing			
Heavy Metals [8,9]	Compliant with EPA human health standards, surface water and groundwater quality	Compliant with EPA human health standards, surface water and groundwater quality	EPA 6010B, 7470A, 7471A
VOCs [8,9]			EPA 8260B
SVOCs [8,9]			EPA 8270C
California Title 22 [9]	Compliant	Compliant	CA Code of Regulations, Title 22, Division 4.5, Chapter 11
California Proposition 65 [10]	Certified (no listed mat'ls)	Certified (no listed mat'ls)	California Proposition 65

DATA ARE TYPICAL PROPERTIES ONLY. THIS DOCUMENT DOES NOT CREATE ANY WARRANTY, EXPRESS OR IMPLIED.

[1-10] Test reports available upon request. Patented and Patents Pending.

Brock USA LLC
www.brockusa.com
July 2019

BROCK

BROCKFILL
THE ENGINEERED INFILL FOR ATHLETES

Typical Properties & Specification

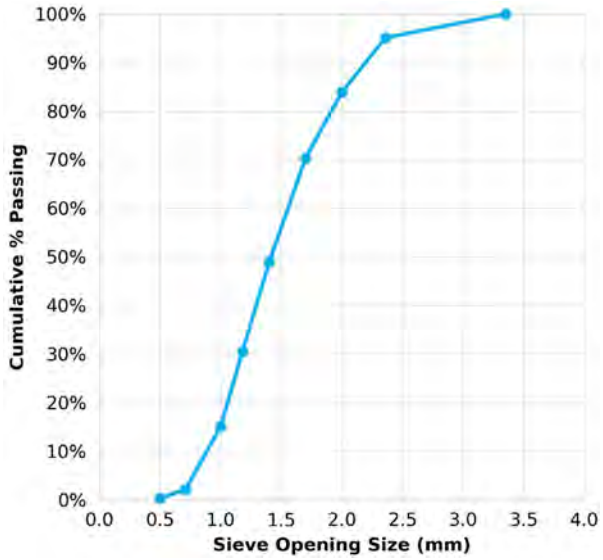
Product Name	BrockFILL™
Product Description	Artificial turf infill made from engineered wood particles produced in the USA
Bulk Density	17 lb / cu. ft.
Packaging	45 cu. ft. supersacks (approx. 750 lb each) – 2 supersacks per pallet
Moisture Content	8 – 15% (at time of production)
Color	Natural to Medium Brown

Sieve Analysis (Typical Results)

ASTM C136, modified (Ro-Tap RX-29, 5 min shaking)

Sieve Size (mm)	Cumulative % Passing		
	Typical Value	Typical Range	Specification
3.35	100	99 – 100	> 99
2.36	95	90 – 100	> 90
2.00	84	75 – 98	-
1.70	70	60 – 90	-
1.40	49	35 – 70	-
1.18	31	20 – 50	-
1.00	15	5 – 35	-
0.71	2.1	0 – 6	< 6
0.5	0.3	0 – 2	< 2

Typical Particle Size Distribution Curve



Environmental Compatibility Testing

Test	Method	Result
Pesticide Testing	AOAC Method 2007.01	PASS
Chlorinated Acidic Herbicides	FDA PAM II Method 180.292	PASS
Total CAM 17 Metals and Hexavalent Chromium	EPA Methods 3050B / 6020 EPA Methods 3060A / 7199	PASS
Leachable CAM 17 Metals and Hexavalent Chromium	EPA Methods 1312 / 6020 EPA Methods 1312 / 7199	PASS
Leachable Semi-Volatile Organic Compounds including Phenols	EPA Methods 1312 / 8270C	PASS

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Test reports available upon request

Patents Pending