

LYME-OLD LYME SCHOOLS

Regional School District #18

A Private School Experience



in a Public School Setting

Special Facilities & Finance Committee Meeting

December 16, 2020

Committee Members Present: Rick Goulding, Co-Chair; Jean Wilczynski, Co-Chair; Daniel Hagan; Diane Linderman; Jennifer Miller; Philip Neaton; Andy Russell; Thomas Sherer; Steve Wilson

Absent:

Administration Present: Ian Neviaser, Superintendent of Schools; Ronald Turner, Director of Facilities & Technology; Bridget Compagno, Director of Communications and Marketing

Others Present: Kevin Fuselier, Milone Macbroom; Eric Hughes, Brock International

I. Call to Order:

The meeting was called to order by Dr. Goulding at 5:30 p.m. This meeting took place virtually through Zoom.

II. Discuss BrockFill as an alternative infield material for artificial turf field:

Mr. Fuselier gave a brief overview of Brockfill and why this product is being considered as an alternative material for the artificial turf infield. Eric Hughes, Northeast Region Vice President gave a detailed presentation of the product. He noted the product is renewable and domestically sourced. He highlighted testing results for key areas; impact; traction, heat, drainage and durability. He further stressed the three points of safety being impacts, heat and traction. A copy of this presentation is attached to these minutes for informational purposes only. An extensive question and answer session took place after the presentation.

III. Adjournment:

Dr. Goulding called to adjourn the meeting at 7:30 p.m.

The Natural

Next Step.



BROCKFILL™
THE ENGINEERED INFILL FOR ATHLETES

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



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

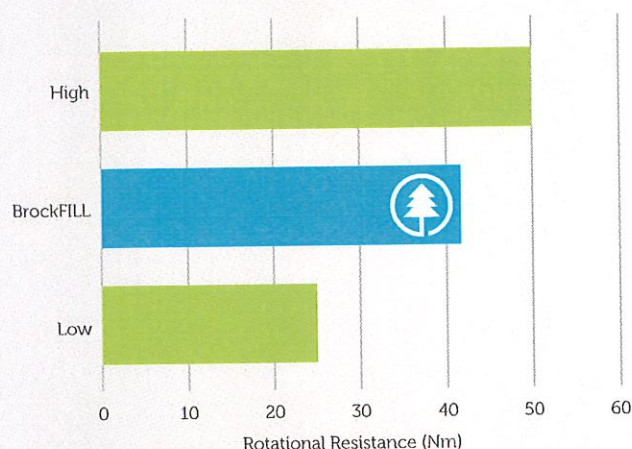


Tested for... everything.



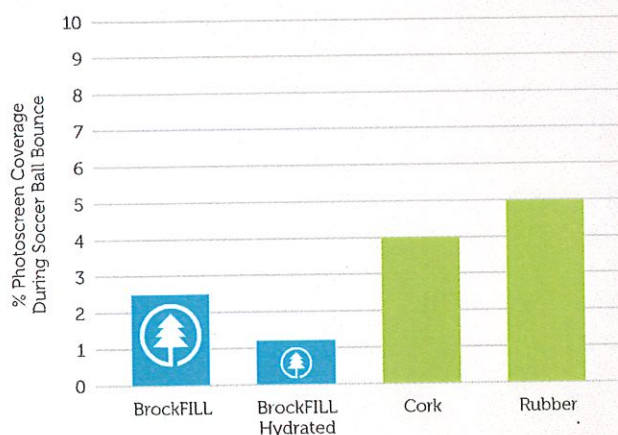
Traction

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.



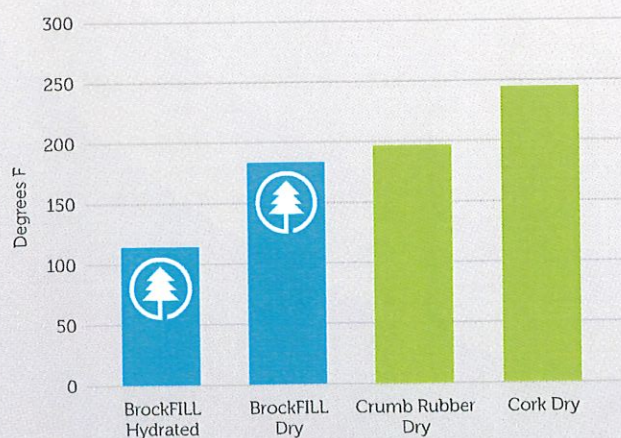
Splash

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.



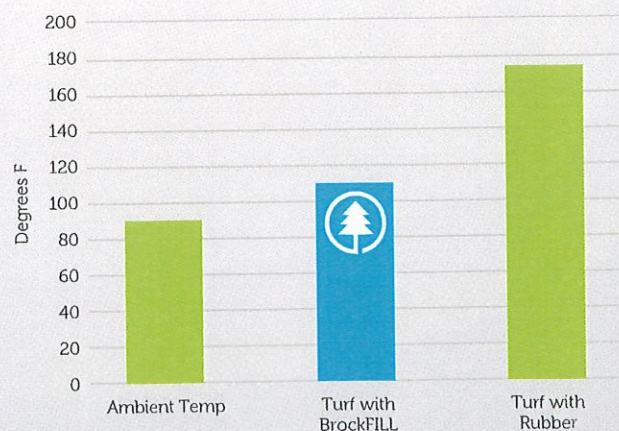
Abrasion

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.



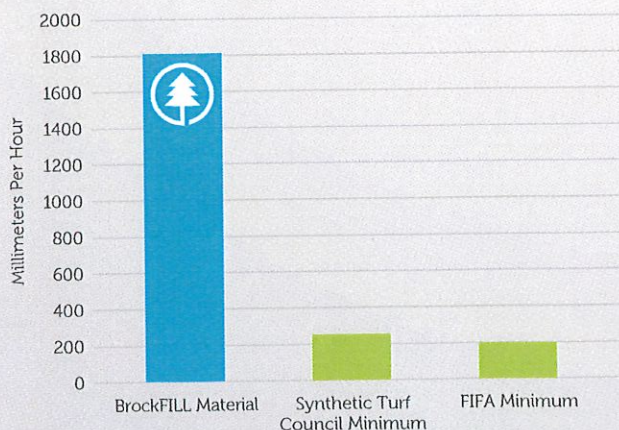
BrockFILL after 20,000 Lisport cycles.

* BrockFILL at 120x magnification.



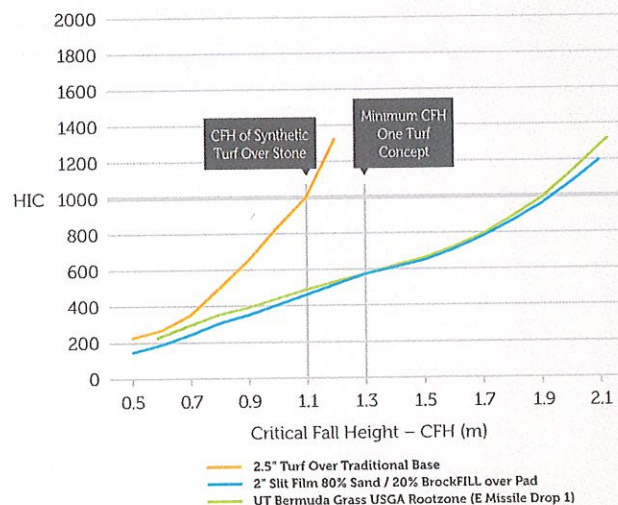
Drainage

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!)



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.



... 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.



www.brockusa.com / 877-276-2587

US and International patents pending



The Natural Next Step.



"If you are going to do something, do it right, and I think we did it right."

- John Perry, Football Head Coach on BrockFILL.

Field References

BROCKFILL®
THE ENGINEERED INFILL FOR ATHLETES

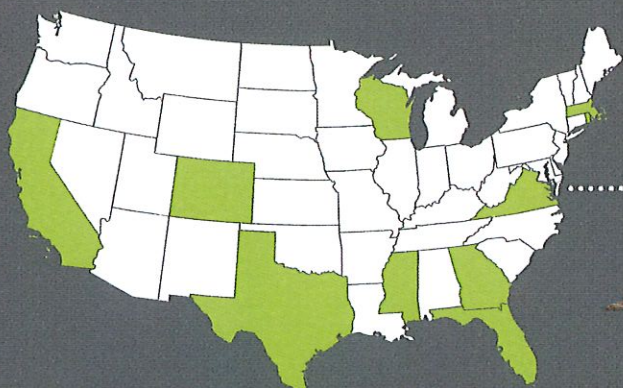
BrockFILL®

Reference List



Project Name	City	State	Artificial Turf Product
Ed DeFore Sports Complex Football Stadium	Macon	GA	AstroTurf
Griffin-Spalding Memorial Stadium	Griffin	GA	AstroTurf
The Athletic Fields at RFK Campus - Field 1	Washington	DC	FieldTurf
The Athletic Fields at RFK Campus - Field 2	Washington	DC	FieldTurf
The Athletic Fields at RFK Campus - Field 3	Washington	DC	FieldTurf
Melbourne High School	Melbourne	FL	AstroTurf
Tampa Bay Rowdies Practice Field	Tampa Bay	FL	ACT Global
Aspen High School	Aspen	CO	Greenfields
Pearl High School	Pearl	MS	Controlled Products
Ore City High School	Ore City	TX	AstroTurf
Capuano Field	Somerville	MA	AstroTurf
Tower School	Marblehead	MA	Greenfields
Copiah Lincoln	Wesson	MS	Shaw Sports
Chiles High School	Tallahassee	FL	AstroTurf
Winder-Barrow High School	Winder	GA	AstroTurf
East Somerville Community Center	Somerville	MA	AstroTurf
Whitesboro High School	Whitesboro	TX	AstroTurf
VSA Long Park Field 7	Haymarket	VA	Shaw Sports
VSA Long Park Field 6	Haymarket	VA	Shaw Sports
Webber International School	Babson Park	FL	ACT Global
Apalachee High School	Winder	GA	AstroTurf
VSA Long Park Field 5	Haymarket	VA	Shaw Sports
Grace Community School	Tyler	TX	Astroturf
Aurora Central High School	Aurora	CO	Greenfields
North Kingston High School	North Kingston	RI	Greenfields
Wauwatosa East High School	Wauwatosa	WI	AstroTurf
Stevenson School	Pebble Beach	CA	AstroTurf
Episcopal Day School	Augusta	GA	Sprinturf
San Domenico High School	San Anselmo	CA	AstroTurf
Brown Elementary	Denver	CO	AstroTurf
Paul Sandoval Campus	Denver	CO	Greenfields

... and we're just getting started!





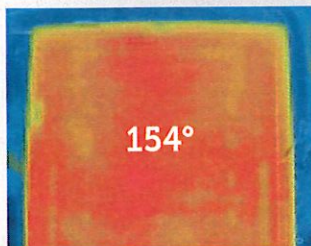
Cooling

Dramatically Reduces Heat

The photos below were taken on a 98° dry day, at the same time, within 200 yards of one another using an infrared camera. The images show a dramatic decrease in surface temperature between a field with BrockFILL and a crumb rubber field with an added cooling agent.

BROCKFILL.

Rubber Infill



98° 165°

"Our coaches and players love it. The traction is great and even seemed to get better during a rain shower event during practice. As you know, the cooler playing surface is BIG in East Texas!"

– Lynn Heflin, Superintendent / Ore City Schools



Durability

BrockFILL is made from sustainably grown wood and harvested here in the USA. It's a durable raw material that withstands the punishment of time and play. BrockFILL has been subjected to simulated rigors of a sports field; including freeze-thaw conditions and rain events.



Pre-Durability Test.

After a Simulated 8-10 Years of Wear.

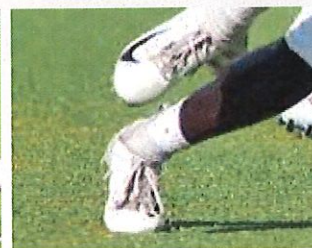
"Bad ass! Working with all sorts of organic materials over the past 9 years, I've seen a lot. Never have I ever seen an organic product that goes in just like rubber, and feels so stable under your feet like BrockFILL. I love the idea of it and it being a renewable resource. I hope it takes the place of rubber!"

– Bill Malia, Installation Manager / Geosurfaces



Splash

The non-resilient nature of BrockFILL eliminates the unnatural "bouncy" feeling of crumb rubber infill and dramatically reduces the rooster-tail splash that's often seen trailing behind kicks, cuts, and tackles.



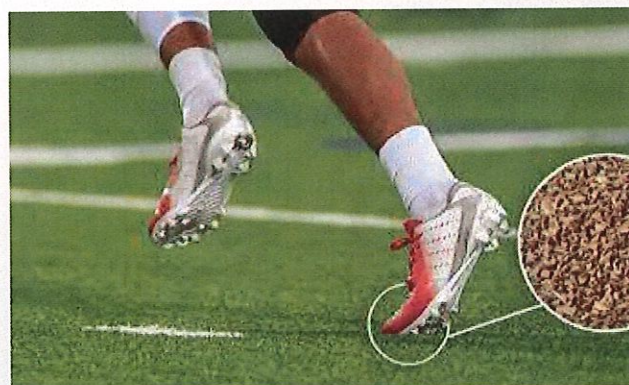
"One of the keys to our growth is to try and stay on the cutting edge of technology and building systems, especially when it comes to sports athletic facilities, we are always looking for what puts our clients ahead of the curve, therefore, our success is their success."

– Jamie Wier, Principal Field Architect / Wier Boerner Allin



Traction

Stability under foot reduces the risk of lower extremity injuries, as well as improves athletic movement. Unlike a "springy" material like rubber, BrockFILL feels more like natural soil under foot. Research has shown less foot movement and faster release time on BrockFILL compared to Rubber.



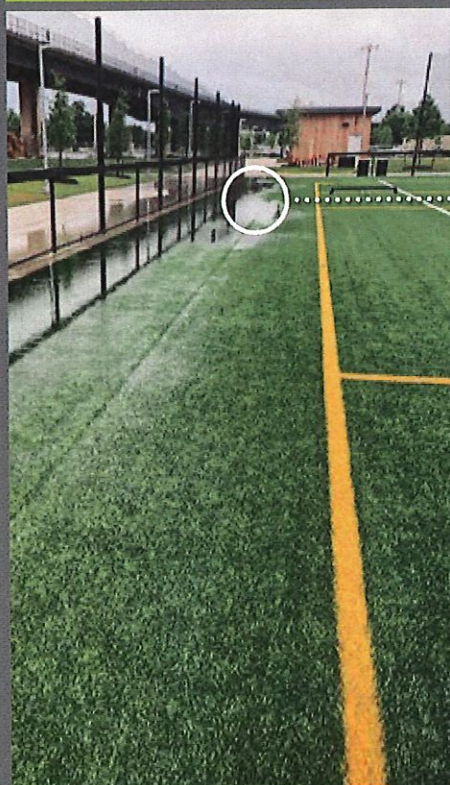
"On BrockFILL you can get in and out of cuts quicker. The wide receivers, the running backs, the linebackers – those kids are explosive kids. They try to get from point A to point B as fast as possible, so this surface helps that because it's not as bouncy as the fields with the rubber beads."

– Coach "Spoon" Risper, Head Coach / Westside Seminoles Football

BrockFILL doesn't float even during heavy rainstorms, and it drains fast.

The roads, ditches, and walkways were flooded, but the BrockFILL field was ready to play within 25 minutes!

Rainstorm:



Sidewalks flooded onto the field as a huge rainstorm pummels this Virginia site with several inches of rain in an hour.

BrockFILL:



When the sidewalks flooded onto the field, BrockFILL remained submerged and didn't move as the field drained.

Game Time:



Once the storm subsided the field drained immediately and was ready for play within 25 minutes! There was no need to groom the field or sweep the infill back into place.



www.brockusa.com / 877-276-2587

US and International patents pending.



Modern Artificial Turf

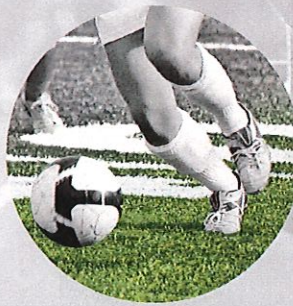
3 POINTS OF SAFETY



IMPACTS




HEAT



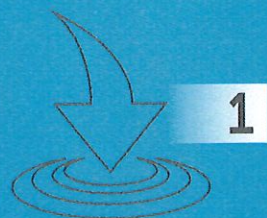
TRACTION

IT ALL STARTS WITH THE ATHLETE.



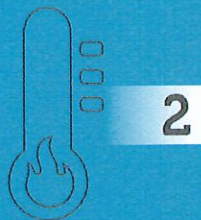
Artificial turf with crumb rubber over stone was a great step forward 30 years ago, but that's now yesterday's field design. Today's quality artificial turf systems more closely mimic a great natural turf field by effectively addressing the . . .

3 POINTS OF SAFETY



IMPACTS

A great surface absorbs big impacts and is firm and fast to run on.



HEAT

Heat stress is a safety issue. A cooler surface can improve hydration, performance and recovery.



TRACTION

Foot stability and faster cleat release may result in lower incidence of ligament injuries, plus better speed.

1. IMPACTS



Preventing concussions in sports has become a national priority. Studies show 1 in 5 concussions occurs by a head to surface impact. And higher energy body impacts with the surface also take their toll.



HEAD INJURY CRITERION (HIC)

The HIC test correlates with the likelihood and severity of a head injury, has been used to test playground surfaces for decades, and was adopted by ASTM for athletic fields in 2016. The HIC impact test drops a 10.1 lb. hemisphere projectile (curved like a human head) multiple times from increasing heights and determines the Critical Fall Height of the surface. The higher the Critical Fall Height, the safer the surface. A good natural grass field will produce a *minimum* critical fall height of about 6 feet or higher. Doing both the Gmax and HIC tests gives a more comprehensive picture of how the field is performing from an impact safety standpoint.



GMAX

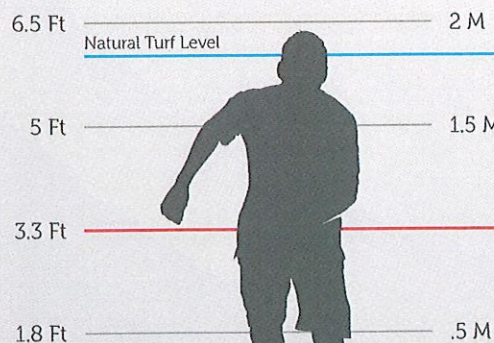
The GMax test is not correlated with head injury risk. The GMax test drops a 20 lb. flat missile from just 2 feet high. The higher the GMax value, the harder the surface. A good natural grass field (the benchmark for a quality athletic field) will produce a GMax below 100, and often below 80.

Artificial turf over stone will produce a GMax above 140 and frequently higher, meaning far more impact energy is absorbed by the body rather than by the surface. Turf over a Brock Shock Pad will mimic the low Gmax of natural grass without making the field soft to run on. (Study: University of TN Dept. of Biomechanics, 2016)



HIGH PERFORMANCE SHOCK PADS

Only turf over a Shock Pad can reach safety ranges found in natural grass.



1.8 METER

A 2" TURF OVER A BROCK POWERBASE YSR SHOCK PAD CAN ATTAIN A CRITICAL FALL HEIGHT OF 1.8 METER OR HIGHER

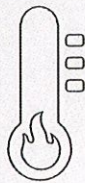
1 METER

A 2" TURF INSTALLED WITHOUT A SHOCK PAD HAS A CRITICAL FALL HEIGHT OF ONLY 1 METER

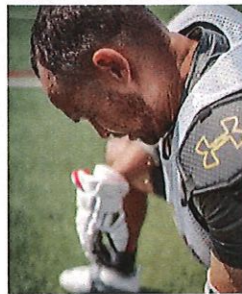
CRITICAL FALL HEIGHT
NOTE: HIGHER IS BETTER



2. HEAT

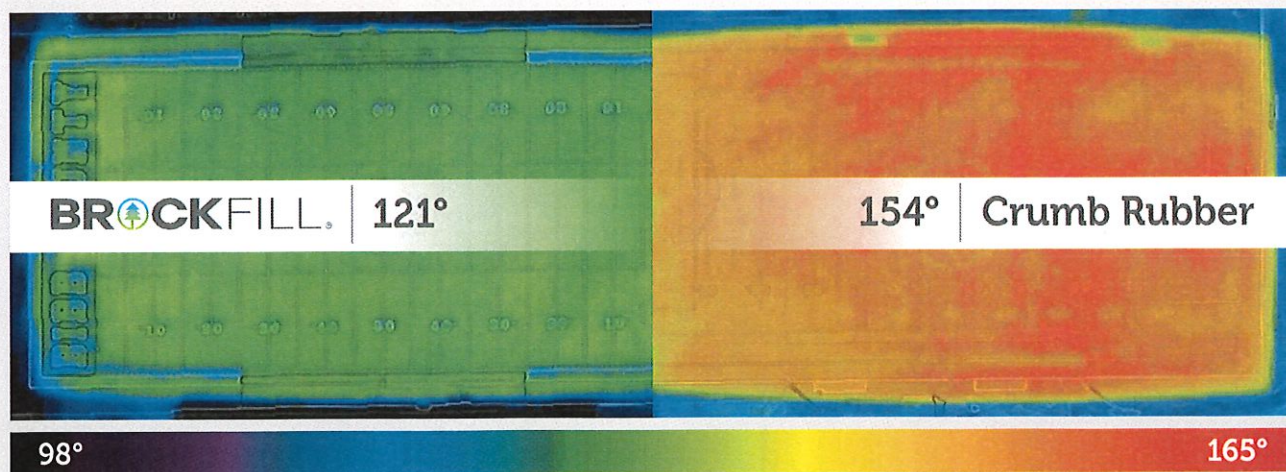


Heat stress is a major safety issue with artificial turf. In many areas in the U.S., temperatures of an artificial turf field with crumb rubber can exceed 180 degrees F.



BrockFILL® COOLS THE FIELD

We measured two adjacent fields in the same location, with the same turf product, the same day, the same time, and both were dry. The BrockFILL field measured 33 degrees cooler than the crumb rubber field with a cooling agent added. Plus the lower thermal conductivity of BrockFILL reduced heat transmission through shoes and skin. The difference is even greater after a rain.



A cooler surface can reduce dehydration which in turn can reduce risk of injury.

"The risk of heat cramps increases when you aren't properly hydrated. As your body loses water during physical activity, your muscles can become tense. This interferes with your athletic performance and can make you more likely to injure yourself. Muscle strains, tears, and bone fractures are common effects of exercising with tense, cramped muscles."

—Orthoatlanta, Orthopedics and Sports Medicine.

The artificial turf industry has known for years it has a heat problem, but the use of cheap black crumb rubber has prevented a solution. **Until now.**

3. TRACTION



Recent NFL and NCAA studies found a higher incidence of lower extremity injuries (ankles and knees) on artificial turf when compared to quality natural grass. Athletes want a surface that is stable under foot. Rubber infill can cause the foot to rock and slide, leading to less stability through the movement. Increasing foot stability and producing a faster release time from the surface (like natural grass does) may be an important factor in lowering these painful and dangerous injuries.

27% ↑

NFL Study*

showed 27% increase in surface-caused lower extremity injuries on artificial turf vs natural turf.

2.9X ↑

NCAA Study*

2.9 times higher incidence of PCL tears on synthetic vs natural turf.



* NFL: 2012-2016, all 32 NFL teams.

NCAA: Study published in 2019 by the American Journal of Sports Medicine using data from 2004-2013 seasons, data included 3+ million subjects.



Traction: Rubber vs. BrockFILL

When you see the plumes of crumb rubber in a game, that is an indication of infill movement and foot sliding that can be avoided with a more stable infill. This instability is one reason athletes prefer to play on natural turf vs. artificial turf with rubber.

Using high-speed photography, you can see how a more stable infill will provide better traction. In a study conducted by Colorado State University Biomechanics, more foot movement and longer cleat release time was seen on turf with crumb rubber vs turf with BrockFILL. In separate testing at the University of Tennessee, artificial turf with BrockFILL showed traction forces similar to high quality Bermuda and Kentucky Blue grass natural turf.





There is one other important point of safety that doesn't directly deal with the game: **THE SAFETY OF OUR PLANET.**

As thousands of artificial turf fields are being replaced each year and more new ones are being built, millions of pounds of plastic and rubber waste are being generated without any recycling solution. Crumb rubber is a microplastic and ends up in our waterways and food. Crumb rubber infill, once hailed as a recycling solution for old tires, is now going to the very landfill it was supposed to avoid. Or worse, the field is rolled up, left in huge piles and "forgotten."

Brock USA is a company that is focused on both the safety and performance of the athlete, and a healthy future for our planet. Brock PowerBase Shock Pads are the only ones that are Cradle to Cradle Certified, meaning they can be recycled indefinitely. BrockFILL is a purely organic infill grown and processed here in America that can be composted when the field is replaced.

We believe the world cannot afford for us to build artificial fields using components that have no end of life environmental solution, nor ones that don't provide a safer field for athletes of all ages and abilities. At Brock, our purpose is to provide effective and affordable solutions to these problems.

Please join us.

Dan Sawyer
Founder and CEO



BROCK[®]
COOLER. FASTER. SAFER.

www.brockusa.com / 877-276-2587

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

