

Modern Artificial Turf

3 POINTS OF SAFETY



IMPACTS



HEAT



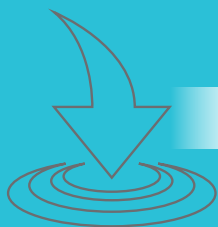
TRACTION

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



1

IMPACTS

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



2

HEAT

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



3

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

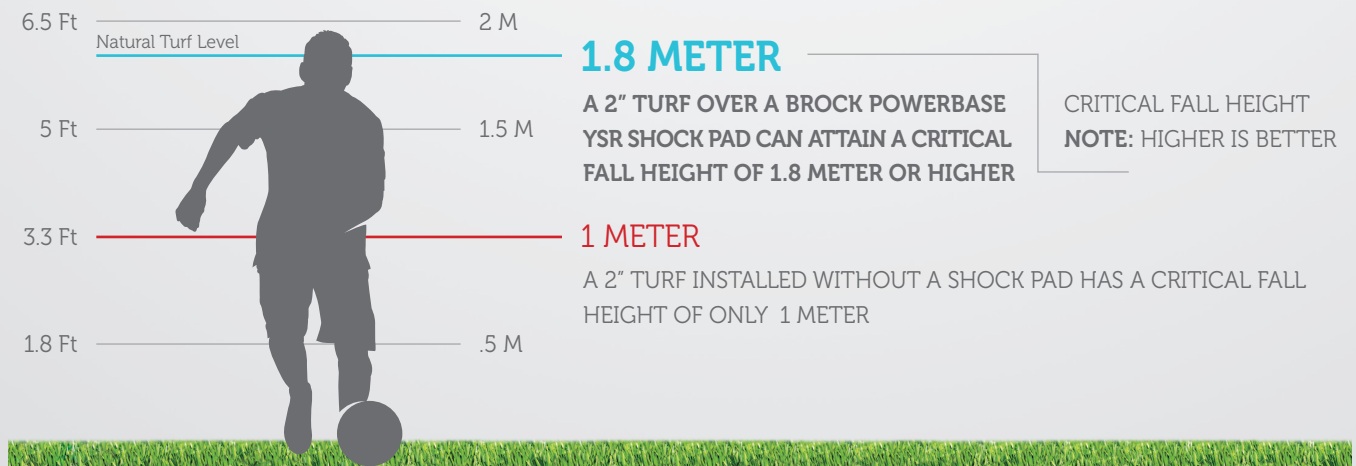
The GMax test is not correlated with head injury risk. The GMax test drops a 20 lb. flat missile from just 2 feet high. The higher the GMax value, the harder the surface. A good natural grass field (the benchmark for a quality athletic field) will produce a GMax below 100, and often below 80.

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

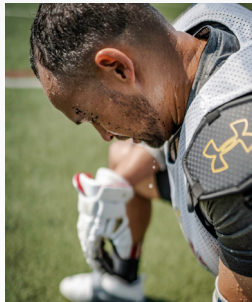
Only turf over a Shock Pad can reach safety ranges found in natural grass.



2. HEAT

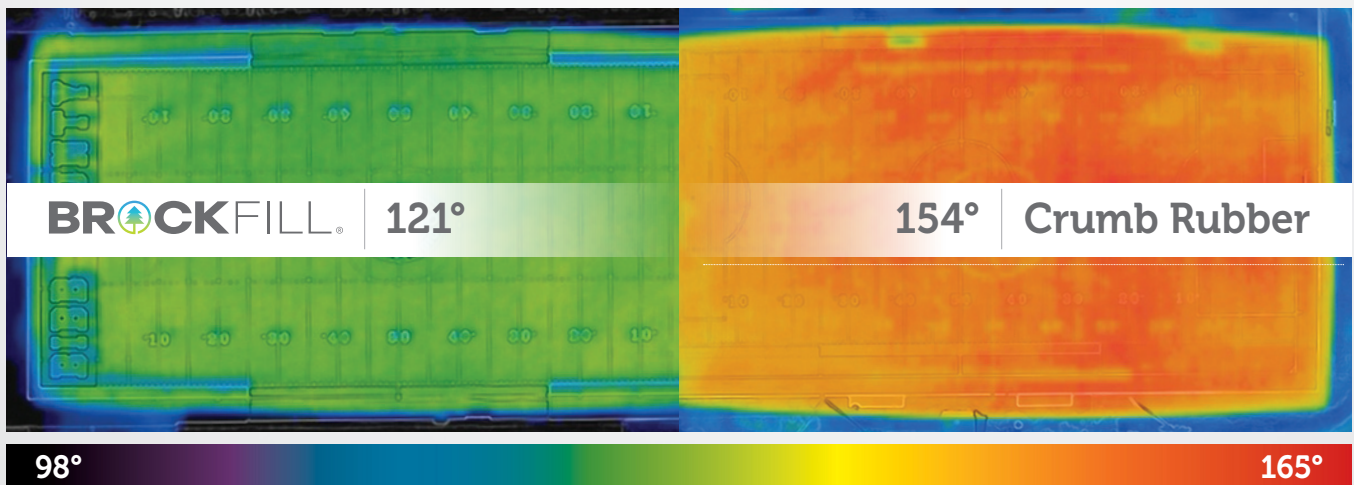


Heat stress is a major safety issue with artificial turf. In many areas in the U.S., temperatures of an artificial turf field with crumb rubber can exceed 180 degrees F.



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