The Endless Possibilities of Green

"Creating possibilities and changing the landscape of design"

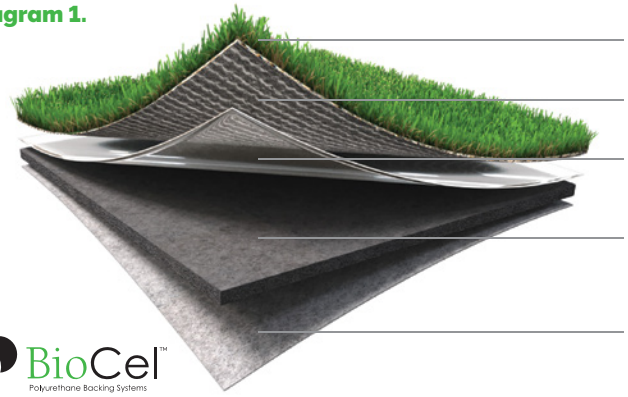
With ForeverLawn you can have the beauty and functionality of natural grass in places you never thought possible.

From rooftops and balconies to high traffic playgrounds and fields, ForeverLawn is beautiful, functional, and environmentally sound.

How Green is ForeverLawn?

- Our synthetic turf products are safe, soft, and environmentally friendly.
- With our vertical drainage rainwater is filtered back into the water table naturally because ForeverLawn is permeable.
- With ForeverLawn you will use less water, eliminate pesticides and fertilizers, provide effective erosion control, and improve air quality by reducing emissions.

Diagram 1.



ForeverLawn uses BioCel polyurethane turf backing systems. BioCel technology represents an enhanced commitment to green by combining two advances in renewable and recycled components, making it Universal's most environmentally friendly product yet.

Amount of Green by Percentage

- ForeverLawn products are between **30-35%** green by weight.
- BioCel technology products are **50-60%** green by weight.
- ForeverLawn installed systems (with infill) are between **60-65%** green by weight.

Universal Textile Technologies, ForeverLawn + The Environment:

- ForeverLawn products feature award winning BioCel™ Turf Backing Systems from UTT.
- These proven polyurethane backings are preserving resources by extending product life and reducing landfill waste.
- With BioCel™ laminate, and a 100% post-consumer recycled non-woven geotextile secondary backing, ForeverLawn offers high performance products offering significant percentages of recycled and sustainable components.
- LEED™ Guidelines - Specifying ForeverLawn synthetic grass with BioCel™ Turf Backing Systems contributes to the total building materials requirement for rapidly renewable materials under the Materials and Resources Section of Version 2.0 of the LEED™ guidelines from the U.S. Green Building Council (see www.universal-textile.net for more information and specifications).
- Polyurethane backings are proven performers—preserving resources by extending product life and reducing landfill water.
- BioCel™ polymers are created from Soybean plants—a stable and 100% renewable resource. UTT's BioCel backing systems meet or exceed the standards set for indoor air quality, with an added benefit--our products rely on growing things--and that helps the air outdoors, too.
- Remined™ is a highly-refined 100% pre-consumer recycled mineral from Imerys Carbonates.

ForeverLawn

8007 Beeson St., Louisville, OH 44641 | 866.992.7876 | foreverlawn.com

MAKE GREEN YOUR FAVORITE COLOR

Premium Synthetic Grass by ForeverLawn

RECYCLING

The multi-layered backing system in ForeverLawn synthetic grass uses technology created from soybean plants, which are 100% renewable resources. The final backing layer is comprised of recycled plastic bottles from Project Yellowstone, an innovative recycling partnership with Yellowstone National Park.

WATER CONSERVATION

Synthetic grass requires no water to maintain its lush, green, beautiful appearance year-round. The Southern Nevada Water Authority estimates that every square foot of natural grass replaced saves 55 gallons of water per year.

CHEMICAL-FREE MAINTENANCE

ForeverLawn products eliminate the need for fertilizers, pesticides, and weed killers used to maintain natural grass landscaping. A perfectly-manicured lawn can be achieved with no mowing, seeding, or edging, which reduces emissions from lawn care equipment.

SUSTAINABILITY OF ARTIFICIAL GRASS

ForeverLawn® customers enjoy the look, feel, and functionality of natural grass while feeling good about their environmental impact. Check it out for yourself and see why with ForeverLawn, GREEN will be your favorite color too.

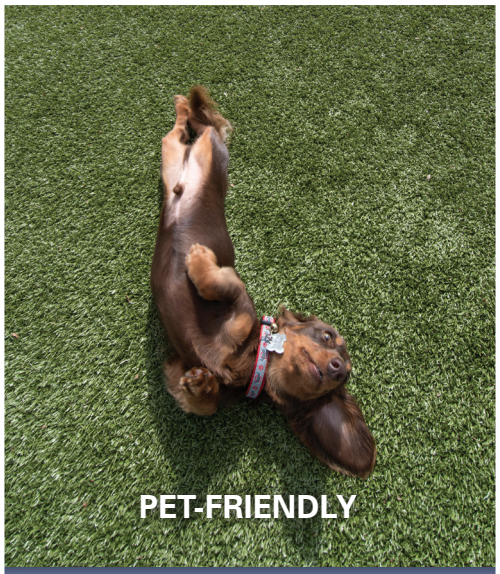
FOREVERLAWN PRODUCTS ARE BETWEEN 30-35% GREEN BY WEIGHT. INSTALLED SYSTEMS (WITH RUBBER INFILL) ARE BETWEEN 60-65% GREEN BY WEIGHT.

Grass without limits.®

BE SAFE, BE FRIENDLY, BE GREEN!

KID-FRIENDLY

- Surpasses Safety Requirements
- Antimicrobial Technology
- Limited Use of Infill
- Designed For High–Traffic Areas
- Clean, Easy-To-Maintain Surface



PET-FRIENDLY

- Edge to Edge Drainage
- Antimicrobial Technology
- No Infill
- Durable
- Low-maintenance

ECO-FRIENDLY

- Recyclable
- Reduces Emissions
- No Fertilizers or Pesticides
- Resilient Surface
- Conserves Water

BE A GOOD STEWARD OF YOUR ENVIRONMENT

Artificial grass products require less water, eliminate pesticides and fertilizers, provide effective erosion control, and improve air quality by reducing emissions. According to the Synthetic Turf Council, the estimated total amount of synthetic turf installed in North America annually conserves more than three billion gallons of water.

RECYCLING AND SYNTHETIC TURF

Where possible, ForeverLawn® incorporates recycled and renewable components into the construction of our products. Additionally, ForeverLawn strives to look for innovative ways to repurpose used turf where possible.

PROJECT YELLOWSTONE

ForeverLawn premium backing incorporates recycled and renewable components from Project Yellowstone and Project Grand Teton, two unique recycling initiatives that collect plastic bottles from the national parks and recycle them into backings for ForeverLawn turf and carpet products.

Yellowstone National Park
UNIVERSAL
PROJECT YELLOWSTONE
Recycle USA • Restore Jobs

M1251 Rev. Rev. 10/19

ForeverLawn® landscape | K9Grass® | GolfGreens™ by ForeverLawn | PLAYGROUND GRASS™ | SportsGrass®

ForeverLawn®

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Existing research on player safety on synthetic turf

Infilled synthetic turf does not increase the rate of serious injuries for players.

- A ten-year study of NCAA men and women's soccer players found that, during practices, players had an increased risk of ACL injury on natural grass fields. The study found no difference in risk of ACL injury when playing on synthetic turf and natural grass during match play.[1]
- A four-year study of MLS players conducted by Cedars-Sinai Kerlan Jobe Institute found there is no significant difference between injuries sustained on synthetic turf vs. natural grass among elite-level soccer players–including foot, knee, hip, and hamstring injuries.[2]
- A study of amateur soccer players found no evidence of increased skin injuries, like abrasions, when playing on synthetic turf compared to natural grass.[3]
- The NFL's "research shows that perhaps the two most serious leg injuries a player can suffer–ACL and Achilles tears–are essentially the same between [synthetic turf and natural grass]."[4]
- Top NFL officials and former players agree that synthetic turf does not increase risk of serious injury:
    - "The NFL and the NFLPA have access to the same injury information, which is collected by independent experts and shared at the CBA-mandated Joint Field Surface Safety and Performance Committee meetings. The committee, including the NFLPA's experts, believe that simply playing on natural grass is not the answer to this complex challenge. Some artificial turf surfaces have a lower injury rate than some grass fields -- and some grass fields have a lower injury rate than some artificial surfaces. Our goal is to decrease injuries on all surfaces," said Jeff Miller, executive vice president of communications, public affairs, and policy for the NFL.[5]
    - When asked about the safety of synthetic turf relative to natural grass, Joe Theismann, Super Bowl winning quarterback and former NFL MVP, said "You know, I got hurt on real grass."[6]

Synthetic turf offers unique advantages for players, including a more consistent playing surface.

- A study of athletes completing a repeated-sprint ability test, found that athletes experience improved physical performance on synthetic turf compared to natural grass.[7]
- Top NFL officials, former professional players, coaches, and community leaders agree that synthetic turf offers unique advantages:
    - “I think the turf, it gives you a reliable field all the time…You always have a clean surface. … The turf didn’t have a factor in [Aaron Rodgers’] recent injury," said Eli Manning, Super Bowl winning former NFL quarterback.[8]
    - "You have other [NFL] players who like playing on the turf field, because it's faster," said Roger Goodell, commissioner of the NFL.[9]

- "The desired surface to play on is turf…The turf fields also have a consistent playing experience." said Branson, MO Parks And Recreation Head.[10]
- "'I think the turf field is safer — there's less injury because there are no rocks or stones — it's a more consistent surface and, rain or shine, we can play,' North High School head coach Chris Wagner said.[11]

The Synthetic Turf Council proudly assists buyers and end users with the selection, use and maintenance of synthetic turf systems in sports fields, golf ranges, municipal parks, airports, landscape, and residential applications. We are a resource for current, credible, and independent research on the safety and environmental impact of synthetic turf, as well as technical guidance on the selection, installation, maintenance, and environmentally responsible disposal of synthetic turf. We are proud to collaborate with our members and their customers to ensure communities have the resources they need to install, maintain, and enjoy access to turf.

Source list

1) Mark Howard, MD, et. al, "Epidemiology of Anterior Cruciate Ligament Injury on Natural Grass Versus Artificial Turf in Soccer," Epstein Family Center for Sports Medicine at Keck Medicine of USC, 2020.

   A ten-year study of NCAA men and women's soccer players found that, during practices, players had an increased risk of ACL injury on natural grass fields. The study found no difference in risk of ACL injury when playing on synthetic turf and natural grass during match play.

2) Sean P. Calloway, et al., "Injury Surveillance in Major League Soccer: A 4-Year Comparison of Injury on Natural Grass Versus Artificial Turf Field," The American Journal of Sports Medicine, 2019.

   A four-year study of MLS players conducted by Cedars-Sinai Kerlan Jobe Institute found there is no significant difference between injuries sustained on synthetic turf vs. natural grass among elite-level soccer players– including foot, knee, hip, and hamstring injuries.

3) Wilbert van den Eijnde, "Skin injury due to artificial turf," TenCate Grass Europe, Kiwa ISA Sport and Radboud university Medical Center, 2017.

   A study of amateur soccer players found no evidence of increased skin injuries, like abrasions, when playing on synthetic turf compared to natural grass.

4) Andrew Beaton, "Aaron Rodgers Got Hurt on a Turf Field. Are They More Dangerous?" *Wall Street Journal*, September 14, 2023.

   The NFL's "research shows that perhaps the two most serious leg injuries a player can suffer -- ACL and Achilles tears -- are essentially the same between [synthetic turf and natural grass]."

5) Bryan DeArdo, "NFLPA president says 2022 season data proves natural grass is 'significantly safer surface' than turf," *CBS News*, April 20, 2023.

   "The NFL and the NFLPA have access to the same injury information, which is collected by independent experts and shared at the CBA-mandated Joint Field Surface Safety and Performance Committee meetings. The committee, including the NFLPA's experts, believe that simply playing on natural grass is not the answer to this complex challenge. Some artificial turf surfaces have a lower injury rate than some grass fields -- and some grass fields have a lower injury rate than some artificial surfaces. Our goal is to decrease injuries on all surfaces," said Jeff Miller, executive vice president of communications, public affairs and policy for the NFL.

6) "Joe Theismann joins The Lead," *CNN*, September 2023.

   When asked about the safety of synthetic turf relative to natural grass, Joe Theismann, Super Bowl winning quarterback and former NFL MVP said, "You know, I got hurt on real grass."

7) Achraf Ammar, et al., Effects of Playing Surface on Physical, Physiological, and Perceptual Responses to a Repeated-Sprint Ability Test: Natural Grass Versus Artificial Turf," International Journal Sports Physiological Performance, September 2, 2019.

   A study of athletes completing a repeated-sprint ability test, found that athletes experience improved physical performance on synthetic turf compared to natural grass.

8) Ryan Glasspeigel, "Eli Manning has surprising stance in NFL turf debate amid Aaron Rodgers' injury," *New York Post*, September 16, 2023.

   "I think the turf, it gives you a reliable field all the time…You always have a clean surface. … The turf didn't have a factor in [Aaron Rodgers'] recent injury," said Eli Manning, Super Bowl winning former NFL quarterback.

9) Quinn Allen, "Roger Goodell addresses NFLPA's plea for grass fields after brutal Aaron Rodgers injury," ClutchPoints, September 13, 2023.

"You have other [NFL] players who like playing on the turf field, because it's faster," said Roger Goodell, commissioner of the NFL.

10) Jason Wert, "Branson RecPlex to change baseball fields to turf," Branson Tri Lakes News, 5/2/23

"The desired surface to play on is turf…The turf fields also have a consistent playing experience." said Branson, MO Parks And Recreation Head.

11) Nicole Alcindor, "Turf Fields Earn High Marks," LIHerald, 1/2/20

"'I think the turf field is safer — there's less injury because there are no rocks or stones — it's a more consistent surface and, rain or shine, we can play,' North High School head coach Chris Wagner said.

October 09, 2023 05:50 AM

NFL's grass versus turf debate is more complicated than it seems

JOE SCALZO

Getty Images

Cleveland Browns running back Nick Chubb is carted off of the field after hurting his knee during the second quarter of the game against the Pittsburgh Steelers at Acrisure Stadium on September 18, 2023.

On the night of Sept. 18 — “Black Monday,” if you’re a Browns fan — ForeverLawn co-owner Brian Karmie was sitting in the stands at Acrisure Stadium in Pittsburgh when Steelers safety Minkah Fitzpatrick delivered a helmet-first hit to Nick Chubb’s knee, and a nasty blow to Cleveland’s playoff chances.

“I saw it on the Jumbotron and I got nauseous,” said Karmie, whose company is the official synthetic turf partner of the Browns. “That was a really gruesome injury.”

Two hours away, as Brian’s brother Dale watched the game on TV, one thought popped into his head: “What if that had happened on artificial turf?”

RELATED

Grass is getting greener for artificial turf company ForeverLawn

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Dragon Seats to introduce upgraded sideline benches at Hall of Fame Game
The NFL's concussion crisis has faded in recent years thanks to a combination of helmet innovations and rule changes, opening the door for a new health issue to surface.

The surface.

Specifically, artificial turf, which many NFL players believe contributes to a much higher rate of non-contact, lower extremity injuries than natural grass.

In September of 2020, NFL Players Association president J.C. Tretter — then a center for the Browns — called for all NFL teams to change their playing surfaces to natural grass, even penning an essay on the NFLPA site headlined, "Only natural grass can level the NFL's playing field."

NFL players have since echoed those complaints, and the debate reached its crescendo on Sept. 11, when Jets quarterback Aaron Rodgers tore his Achilles tendon on the synthetic turf at MetLife Stadium.

Soon afterward, Rodgers' former Green Bay Packers teammate, David Bakhtiari, posted on X (formerly Twitter): "How many more players have to get hurt on ARTIFICIAL TURF??!" and "Can we put an end to this (bleep) already?"

But here's the thing. A day earlier, the Baltimore Ravens' 24-year-old running back, J.K. Dobbins, tore his Achilles during a game against the Houston Texans. That injury happened on grass.

Guess which one caused an outcry?

“Two high-profile athletes — one of them almost 40 years old, one of them (24) — tear their Achilles,” Dale Karmie said. “One was on natural grass. One on turf. Only one of them gets the news.”

His conclusion?

“I think we’re dealing with a false narrative,” he said.

Surface studies

Before you say, "Of course the guy who runs a synthetic turf company is going to defend turf,” consider this. A third-party company called IQVIA recently studied the issue for the NFL and the NFLPA and found that the NFL’s rate of non-contact injuries to the knee, ankle and foot in 2021 and 2022 was essentially the same on natural and artificial playing surfaces.

That wasn’t always the case. Tretter’s essay cites a 2012-2018 study showing turf injuries were more prevalent, something that continued for the 2019 season. But the difference began narrowing in 2020, IQVIA’s study found. By

2021, artificial surfaces had an incident rate of .042 per 100 in 2021, while the rate for natural surfaces was .041 per 100.

“But sometimes one tweet from a player speaks louder than the research,” Brian Karmie said. “That’s the world we live in, soundbites and snippets.”

Two days after Rodgers’ injury, NFL commissioner Roger Goodell went on ESPN’s “First Take” to defend synthetic surfaces, saying the league will rely on scientific evidence, not anecdotal evidence, for its field policies.

“We want to give our players the best possible surface to play on,” he said. “That can’t be done by my feeling at looking at a particular injury. It’s got to be done with a real process. You have to look at it with medical experts. Look at it with engineers. Look at it with people on the cleats. Look at every aspect of what can go into that injury, including the training and where a particular player is at any given time.”

Fifteen NFL stadiums have natural grass, including Cleveland Browns Stadium, which uses Kentucky bluegrass. (Most grass stadiums use Bermuda.) The Browns have played on grass dating back to Municipal Stadium, “and we’ve never really considered changing,” said Phil Dangerfield, the Haslam Sports Group’s vice president of operations. “We’re really happy with natural grass.”

The NFL’s other 15 stadiums — including MetLife and SoFi Stadium, which each have two NFL teams — use synthetic turf, typically FieldTurf.

While most dome or retractable roof stadiums use turf, there are two that use natural grass: State Farm Stadium (home of the Arizona Cardinals) and Allegiant Stadium (Las Vegas Raiders).

Both use a retractable field tray, where the grass is grown outdoors and rolled inside on game days. And both stadiums have had issues with slippery turf, something that came to a head during last year's Super Bowl at State Farm Stadium.

The NFL spent two years and $800,000 growing a new Bermuda/rye grass hybrid at a nearby Scottsdale sod farm specifically for the game and ended up with a field that had worse traction than Dennis Kucinich’s presidential bid.

"I’m not going to lie, it’s the worst field I ever played on," Philadelphia Eagles defensive end Haason Reddick said afterward.

Consequently, it’s hard to make a blanket statement like “Grass is better” or “Turf is better,” the Karmies said. The grass field at Acrisure Stadium is notoriously bad late in the year, in part because the Steelers share their stadium with the University of Pittsburgh. The turf at Chicago’s Soldier Field is as bad as the team that plays on it. Plus, the shoes can matter as much as the surface, since the length and the design of the cleats often dictates whether a player slips or sticks in the ground.

And while every synthetic turf field has to pass certain tests, and those standards are always being updated and refined, there are no such standards for turf, Dale Karmie said.

“There are no tests, no standards, no limits,” he said.

Just as the grass differs among NFL cities, so does the turf. ForeverLawn, for instance, recently installed new SportsGrass Max at Canton’s Tom Benson Hall of Fame Stadium, "and I’d argue that it’s markedly better than any field that’s in an NFL stadium right now,” said Dale Karmie, whose company is located 15 minutes away, in Louisville.

Benson's turf — which was used by two USFL teams in the spring and by the Browns and Jets in the Hall of Fame Game — has a shock pad underneath, something only one other NFL stadium (U.S. Bank Stadium in Minnesota) has. ForeverLawn's multi-fibered system uses less rubber infill and more sand, Dale Karmie said, making it soft and stable.

"I like to compare turf to cars," he said. "All cars have four tires, an engine, a steering wheel and brakes. They all drive. Some perform differently than others. Some are safer than others. Some drive faster, corner better, accelerate quicker.

"Turf is no different."

Is he confident his best product would beat grass?

"You're asking us to compete against God," he said, laughing. "That's tough. But when you add in the element of weather, of rain, of potential divots and things that can happen on natural grass, I think we'd be right there."

Grass improving, too

Of course, turf companies aren't the only ones innovating. The Browns use a combination of technologies to maintain the surfaces in Berea and at Cleveland Browns Stadium, including SubAir (which delivers fresh air to the roots and subsoil) and Hydronic temperature control (which keeps the soil from getting too hot or cold).

Those technologies help the grass recover quicker while extending the growing season, which is critical in a cold-weather city such as Cleveland.

"We're fortunate to have a really qualified set of experts oversee our grounds," Dangerfield said. "They do a phenomenal job and it has given us the ability to keep natural grass fields."

Still, there are limits. The Browns use synthetic turf in their indoor facility — ForeverLawn will be replacing that surface in the next year or two — and the stadium grass will always be at the mercy of Mother Nature, particularly late in the year when the weather turns.

The Browns would like to host more non-football events at the stadium, but "we have ongoing discussions in our organization about how those events will impact our field," Dangerfield said.

High schools and colleges don't have that luxury, nor do they have the money or the resources to keep a grass field at the NFL standard. That's why the NFL's field debate it's unlikely to trickle-down to the lower levels, where approximately 2,500 turf fields are installed each year.

"At Cleveland Stadium, they play at most 30 hours of football a year," said Joe Bogdan, the director of facilities at Canton City Schools, which uses Benson Stadium for Canton McKinley's home football games. "Between practices and games, we have 30 hours of use in a week and a half."

Before Bogdan took the job in Canton, he was the athletic director at East Canton High School, which had a grass field at its football stadium. East Canton didn't have a soccer team, but it did play freshman, JV and varsity football games on the grass field, "and we worried about rain or playing two weeks in a row at home," he said. "Once it gets muddy and you lose it, you're not getting it back until the next spring. It's not happening."

After leaving East Canton, he took the athletic director job at Uniontown Lake, which purchased one of ForeverLawn's first turf fields. That field had some issues, "but they continued to change the product and innovate," Bogdan said. "Then they worked with the NFL to put the turf in at Benson and we've had zero complaints. I think it performs really, really well. It's as good as any other synthetic turf I've been around."

Dangerfield also praised the Benson turf — "The NFL was really happy with it," he said — and New Jersey Generals GM Billy Devaney told the Karmies it was the best field he's ever seen.

"That was nice because turf is like the officials," Brian said. "Nobody reaches out to say how good the officials were in the game. You only hear about it if there is a problem."

Looking to the future

ForeverLawn has five business verticals — landscape, playgrounds, canine grass (for dog parks), golf greens and SportsGrass — and only about 15-20% of its business comes from playing fields. But SportsGrass is its most visible product, and its fastest-growing market.

“We did maybe one field a year for a decade, and part of the reason was because it was generally a bid market,” Dale Karmie said. “Once you met the minimum standard (for quality), they were going to take the lowest bid if it’s public money. That’s not where we perform. We’re a high-quality product with a high-quality install, and we cost a little more.”

For some customers, that’s a non-starter — and not just at the lower levels. NFL teams will spend $1 billion (or more) on their stadium and cut corners on the turf, Dale Karmie said.

“I want to be careful here, because I don’t want to throw other companies under the bus,” he said. “But even some of the new systems being installed are old technology.

“(Bengals quarterback) Joe Burrow talked about how each stadium has different turf and how there should be a set standard. I understand the intention there. But I think it’s wrong. If everyone has a designed standard, you never have innovation. Nothing gets better.”

Consequently, Brian Karmie would like to see the NFL lead the way on the turf debate, believing that if the quality improves at the professional level, it’ll trickle down to everyone else.

“The turf can continue to get better,” he said. “With concussions, they studied the helmet and the helmet got better. In NASCAR, they’ve made those cars better and safer. Turf is the same way.”

One more thing. While improving turf and grass surfaces is a worthy goal, it won’t change the fundamental nature of the NFL. Both Rodgers and Dobbins tore their Achilles while being tackled. Fitzpatrick’s hit on Chubb tore his MCL and stretched his ACL, and there was little that the grass, or Chubb’s cleats, could have done to prevent that.

“Football is a violent sport played by incredible athletes that are strong and fast and fire their bodies into each other,” Dale Karmie said. “Injuries are going to happen.”

Can you still blame the playing surface for what happened to Rodgers? Maybe.

But it sure seems like shaky ground.

SPORTS LABS

TESTING TECHNOLOGY FOR SPORT

Laboratory Analysis Report

Edge XG

Report Number: 93646 / 4882

Report Status: Final

Client: ForeverLawn Inc.

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SPORTS LABS

TESTING TECHNOLOGY FOR SPORT

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Laboratory Test Report

Report Number: 93646/4882

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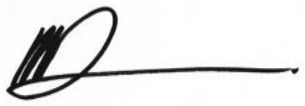
Signed:		**Signed:**	

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Country:	United States of America

System Details				
System Identification	Edge XG over Concrete			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	N/A	Performance Infill	Rubber	1.8
Sub-base	Concrete	Stabilizing Infill	N/A	N/A

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
60	9.2	39	141	32	0.81

System Details				
System Identification	Edge XG over Stone			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	N/A	Performance Infill	Rubber	1.8
Sub-base	Stone	Stabilizing Infill	N/A	N/A

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
66	9.8	36	128	32	0.82

System Details				
System Identification	Edge XG over Concrete			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	PP20	Performance Infill	N/A	N/A
Sub-base	Concrete	Stabilizing Infill	Silica Sand	5.1

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
61	8.5	38	120	47	1.17

System Details				
System Identification	Edge XG over Stone			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	PP20	Performance Infill	N/A	N/A
Sub-base	Stone	Stabilizing Infill	Silica Sand	5.1

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
65	8.8	35	114	47	1.29

System Details				
System Identification	Edge XG over Concrete			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	PP20	Performance Infill	Rubber	1.0
Sub-base	Concrete	Stabilizing Infill	Silica Sand	2.5

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
73	10.9	35	92	30	1.27

System Details				
System Identification	Edge XG over Stone			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	PP20	Performance Infill	Rubber	1.0
Sub-base	Stone	Stabilizing Infill	Silica Sand	2.5

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
73	11.3	37	90	30	1.30

System Details				
System Identification	Edge XG over Concrete			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	YSR	Performance Infill	BrockFill	1.0
Sub-base	Concrete	Stabilizing Infill	Sand	3.5

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
69	9.2	31	91	28	1.84

System Details				
System Identification	Edge XG over Stone			
Carpet Type	Edge XG		Infill Identification	Infill Rate (lbs/ft^2)
Shockpad	YSR	Performance Infill	BrockFill	1.0
Sub-base	Stone	Stabilizing Infill	Sand	3.5

Test Results					
Shock Absorption (%)	Vertical Deformation (mm)	Energy Restitution (%)	Gmax (g)	Rotational Resistance (Nm)	HIC (m)
69	9.6	30	82	28	1.89

SPORTSGRASS® EDGE XG

PRODUCT SPECIFICATIONS

Components	Specifications
YARN TYPE	Primary: Polyethylene parallel slit film Secondary: Heat set textured nylon monofilament
YARN COLOR	Primary: Field green Secondary: Turf green/ tan
YARN COUNT	Primary: 10,000/1 Secondary: 5,040/12
TUFTING CONSTRUCTION	Single yarn
BLADE HEIGHT	2"
TUFTING GAUGE	3/8"
FACE WEIGHT	48 oz.
TOTAL PRODUCT WEIGHT	103 oz.
BACKING	Three-layer premium backing made with BioCel™ polyurethane and 100% recycled geotextile nonwoven fabric on a dual layer primary.
SEAMING	Micromechanical bonding reinforced with adhesive
INFILL	2 pounds of rubber / sf maximum sand, organic, mixed, and alternative infills available

[1] Product heights shown may have a variance of 1/8" and product weights shown may have a variance of 5%.

[2] Recommended infill for normal installation. More or less can be used, and heavy traffic areas will perform better with higher infill levels.

Grass without limits.®

SportsGrass by ForeverLawn

8007 Beeson St., Louisville, OH 44641
866.992.7876 | sportsgrass.com

SKU Rev. 03/24

www.testingservices.us ▪ (706)226-1400
office@testingservices.us

CLIENT:

Company:	ForeverLawn, Inc
Address:	8007 Beeson Street
	Louisville, OH 44641

TEST MATERIAL:

Date Material Received:	December 11, 2022
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Turf Description:	EDGE XPL

Test Overview: Testing Services LLC was instructed by the client to perform **product testing** consisting of yarn, finished turf construction and performance characteristics.

Test Methods:

Standard:	ASTM F2765	Test Method:	Standard Test Method for Total Lead Content of Synthetic Turf Fibers (Yarn Lead Content)
Standard:	ASTM D2256	Test Method:	Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method (Yarn Breaking Strength/Elongation)
Standard:	ASTM D5848	Test Method:	Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings (Weights: Total, Face, Primary, Secondary)
Standard:	ASTM D5823	Test Method:	Standard Test Method for Tuft Height of Pile Floor Coverings (Tuft Height above Backing)
Standard:	ASTM D5793	Test Method:	Standard Test Method for Binding Sites per Unit Length or Width of Pile Yarn Floorcoverings (Stitch & Gauge Count)
Standard:	ASTM D1335	Test Method:	Standard Test Method for Tuft Bind Strength of Pile Yarn Floor Coverings (Tuft Lock)
Standard:	ASTM D5034	Test Method:	Standard Test Method for Breaking Strength of Textile Fabrics (Grab Tear Strength)
Standard:	ASTM D2859	Test Method:	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials (Pill Flammability)
Standard:	ASTM F355a	Test Method:	Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials (Gmax)
Standard:	ASTM F3189	Test Method:	Standard Test Method for Measuring Force Reduction, Vertical Deformation, and Energy Restitution of Synthetic Turf Systems Using the Advanced Artificial Athlete (Force or Shock Absorption, Deformation)
Standard:	EN 15301	Test Method:	Surfaces for Sports Areas: Determination of Rotational Resistance (Rotating Cleat Interaction)
Standard:	ASTM F1551	Test Method:	Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials: Suffix AT-030: Sports Shoe Traction (Coefficient of Friction) and Traction Differential (Wet & Dry Shoe Traction)
Standard:	ASTM F1551	Test Method:	Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials: Suffix-DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems and Permeable Bases (Water Permeability)

Testing Services (TSI) LLC
817 Showalter Avenue
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Dalton, GA 30721

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CLIENT:

Company:	ForeverLawn, Inc
Address:	8007 Beeson Street
	Louisville, OH 44641

TEST MATERIAL:

Date Material Received:	December 11, 2022
Material Type:	Synthetic Turf
Material Condition:	Excellent, New
Turf Description:	EDGE XPL

Test Results:

Yarn Analysis

Method	Test Description	Test Result 10,000 Slit-Film	
ASTM F2765	Lead Content	< 0.5 mg/Kg	
ASTM D2256	Yarn Breaking Strength/Elongation	28.10 lbs/force	74.1 %

Construction Analysis

Method	Test Description	Test Result
ASTM D5848	Total Product Weight	101.93 oz/yd²
	Pile Yarn Weight	48.25 oz/yd²
	Primary Backing Weight	7.65 oz/yd²
	Secondary Backing Weight	46.03 oz/yd²
ASTM D5823	Average Tuft Height	2.0"
ASTM D5793	Stitch Count	3 spi
ASTM D5793	Gauge	½"
ASTM D1335	Average Tuft Bind	14.4 lbs/force
ASTM D5034	Average Grab Tear Strength -Length Direction	306 lbs/force
ASTM D5034	Average Grab Tear Strength -Width Direction	230 lbs/force

Performance Analysis

Method	Test Description		Test Result	
ASTM D2859	Pill Flammability (1)		Passes 8 of 8 Samples	Meets 16 CFR 1630 (FF1-70)
ASTM F355a	Gmax (1,3)		156	
ASTM F3189	Force/Shock Absorption (1,2,3)	Deformation (1,2,3)	55.9 %	8.0 mm
EN15301	Dry Rotational Resistance (1,2,3)	Wet Rotational Resistance (1,2,3)	38 Newton/meter	36 Newton/meter
ASTM F1551	Dry Shoe Traction Initiate (1,2,3)	Dry Shoe Traction Sliding (1,2,3)	1.38	0.88
ASTM F1551	Wet Shoe Traction Initiate (1,2,3)	Wet Shoe Traction Sliding (1,2,3)	1.31	0.82
ASTM F1551	Water Permeability (1)		51.4 inches/hr	

[1]Infill System: 1.7 lbs/ft² 100% Crumb Rubber
[2]Underlayment Shock Pad: None
[3]Sub-Base: 3" Aggregate (2" # 57 Stone, 1" Compacted Fines)

We undertake all assignments for our clients on a best effort basis. Our findings and judgments are based on the information to us using the latest test methods available.
TSI can only ensure the test results for the specific items tested.
Unless otherwise noted in the deviations sections of this report, all tests are performed in compliance with stated test method.

Test Report Approval:

Erle Miles, III, Lab Director Testing Services (TSI) LLC

TSi Accreditation: Our laboratory is accredited by the US Dept. of Commerce, National Institute of Standards and Technology: ISO/IEC 17025:2005. Our code # is: NVLAP 100108-0.
TSi is an Organizational Member of ASTM (American Society for Testing and Materials). TSi is a certified independent testing laboratory by the STC (Synthetic Turf Council).

NVLAP TESTING 100108-0

ASTM Organizational Member

SYNTHETIC TURF COUNCIL CERTIFIED

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