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THE HOME OF SPORTSTURF MAGIC
athletic fields in the transition zone and southern climates where turfgrass growth from both cool and warm-season turf occurs 10 to 12 months of the year.

For example, Shields Watkins Field at Neyland Stadium in Knoxville was constructed with a sand-based rootzone that had 0.5% organic matter by weight. Over a 10-year period, even with regular core aerification and sand topdressing, a 4-6% organic matter layer by weight formed in the top 5 inches of the 12-inch rootzone.

For Bob Campbell, University of Tennessee Athletic Field Manager and past president of STMA, the increase in organic matter was not high enough to significantly cause drainage problems, but infiltration rates decreased from the original rates. Because Shield Watkins Field is an overseeded athletic field, organic matter accumulation for the two turf species being used accumulates for 10 months of the year. Compounding the problem is the fact that core aerification was only be done during the early summer and regular sand topdressing amounts and frequencies are limited due to the fall football season.

Since the organic matter accumulation occurred over a 5-inch depth, conventional core aerification can not penetrate deep enough to break up the layering profile, but coupled with sand topdressing the percent organic matter accumulation is diluted. In order to address the layering issue, Campbell used deep tine drill and fill to create a series of channels, backfilled with the original sand blend, for water infiltration. The increase in organic matter was not necessarily a major problem, but was an issue that needed to be dealt with in regards to water infiltration. Conversely, the increase in organic matter by weight over time has helped increase the nutrient holding and water hold capacities of the rootzone.

John Sorohan, Ph.D., is assistant professor, turfgrass science, in the Department of Plant Sciences at the University of Tennessee.
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Nate Patrick, business development manager for Redexim Charterhouse, spoke recently about the increased attention being paid to maintaining the synthetic infill surfaces proliferating around the country. The Synthetic Turf Council (STC) says there will be about 1,200 installations in 2006. Patrick said though many buyers may view their fields as “no maintenance” the fibers do get matted down, and the infill gets compacted, which can cause drainage issues if the rubber compacts. So “no maintenance” is out the window as companies such as GreensGroomer, Bannerman, Sisis, Parker Minuteman, as well as Redexim Charterhouse now market products specifically for this purpose.

All the carpet manufacturers that stitch these synthetic fields together have become members of the STC and agreed to use the same Gmax parameters, Patrick said. He and Redexim Charterhouse Vice President Paul Hollis (congrats to your Cardinals!) are members of STC’s new maintenance committee that currently is re-writing the organization’s maintenance standards. These standards when available should be “must-read” material for synthetic turf managers.

Patrick has talked to a lot of turf managers with synthetic fields. “One big question I hear is ‘Is using this machine going to void my warranty?”’ he said. Patrick said his company’s machines (and others) have been approved by all the synthetic field manufacturers. When asked, “What do I need to do to maintain my synthetic turf field?” Patrick says there are three important maintenance practices that will prolong field life: 1. Keep all surfaces free of debris, 2. Routinely use a grooming brush to vertically stand the field’s fibers, and 3. Use a tool that can agitate and fluff your rubber infill so it doesn’t become compacted.

Tom Moore, national sales manager for GreensGroomer, said some of the top synthetic manufacturers approached his company more than six years ago about making a machine for their products. “We had a reputation from the golf grooming market and we were fortunate to be asked by the manufacturers to get involved,” said Moore. He agrees with Patrick and said it is absolutely necessary to have a machine to stand the fibers upright (“They have a long nap that wants to lay over”), and that the sand and rubber infills will compact and need leveled out.

“The Verti-Air machine blows high-speed air deep into the synthetic turf carpet, then a rotary brush picks up the dislodged infill material and debris and throws it on a filter, which returns the cleaned infill to the field.”

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“We have a lot of sales through our dealers but even more from recommendations from manufacturers or architects,” Moore said. Some synthetic marketers include equipment packages as part of the deal, and that some architects are now specifying certain equipment to be used on their fields, he said. “For example, Sportexe installers use our equipment, and then train the field staff on this equipment after the installation,” Moore said.

Continued on page 16
Artificial Intelligence

A new range of professional artificial turf care machines have been developed by Redexim Charterhouse. Known worldwide for their reliable and effective range of natural turf care equipment such as the Verti-Drain®, Redexim Charterhouse has produced a complete range of equipment to meet the challenging needs of the artificial turf market.

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The Verti-Brush quickly and effectively levels and distributes applied or existing infill with powerful hydraulic brushes.

Verti-Top
The Verti-Top employs a highly effective synthetic rotary brush to remove debris and top layer infill from the turf, then sifts the debris out in a unique vibratory shaker which redistributes the clean infill back on the field.

Verti-Groom
To brush, loosen and decompacet the hardest infill, the Verti-Groom is equipped with a variety of interchangeable tools.

Verti-Air
The Verti-Air utilizes a rotary brush and turbine compressed air to lift all material out of the turf, dry and filter the material, sift out the debris and return the clean, dry and decompacted infill back into the turf.

Verti-Broom
For brushing and striping of artificial turf, nothing beats the proven Verti-Broom. The highly effective triangular arrangement of the brushes will straighten and groom each grass blade for an attractive and realistic finish.

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Hardness testing is essential after construction

When constructing a new artificial turf surface there are, of course, many items to consider. While most construction related matters should be dealt with during contract negotiations or during construction, one very important factor needs to be taken care of right after the field has been installed. Field hardness testing (Gmax) is recommended by the Synthetic Turf Council, manufacturers, and turf experts for all new artificial turf installations. Hardness testing should be performed on-site after the infill has been added to the turf system.

Maximum allowable Gmax results or an acceptable range of results should be part of the architect and/or manufacturer specifications. Hardness testing is one of the final steps in the approval of a newly installed field. Results from another field or lab test results should not be used. Testing procedures must use the equipment and techniques detailed in ASTM method F 355A. A Clegg hammer is not acceptable for hardness testing on a synthetic field.

Gmax measurements provide an indicator of the shock attenuation or hardness of a surface. While this test measures field performance, it can also be related to safety. The impact from a fall is either absorbed by the player, equipment, or the field. Fields that are too hard can present an elevated risk of injury to the users. Fields that are too soft can present player performance problems.

Studies, including one by Northwestern on impacts to the head of a middle linebacker, show that a Gmax value of 200 should be the maximum threshold to provide an acceptable level of protection to users.

The turf industry has in general accepted a Gmax value of 200 as the maximum acceptable reading for an older synthetic field. New fields, however, should have much lower readings. Typical acceptable values are in the 90-150 range. These Gmax ratings are comparable to those obtained from good quality natural turf, and they allow for gradual hardening of the field over time.

Hardness testing performed immediately after field installation does not just provide a performance indicator. It also shows that you are performing due diligence to provide an acceptable playing surface for your athletes. This can be very important in case of an unfortunate accident. Annual or routine maintenance testing after construction provides data for determining warranty compliance and for diagnosing or preventing problems. Proper construction, maintenance, and testing are all essential pieces of the puzzle for providing a safe, high performance field.

Sam Ferro is the President of Turf Diagnostics & Design. He can be reached at sferro@turfdiag.com.
Expertise - From its infancy about 38 years ago through today, we have been a major participant in the evolutionary process of modern synthetic turf systems. Our expertise with adhesives for installing synthetic turf results from developing the first urethane adhesive for turf in about 1969; designing new generations of turf adhesives since then; using our proprietary tests in continuing laboratory development work, plus being on countless "in progress" synthetic turf installations. While we rely heavily on our laboratory, we know that laboratory tests such as tensile strength, elongation, modulus of elasticity, etc. do not predict if weathering will degrade the adhesive to a point where it becomes an installation "time bomb". Also, such laboratory tests do not show the adhesive's handling properties in different climates and/or under variable outdoor weather conditions (Note - to be practical, the adhesive must have a wide outdoor working window under variable weather conditions).

Current Trend - Today most synthetic turf installations are loose laid instead of being totally glued down. This trend is slowing and may eventually reverse, but for now the individual pieces or rolls of turf are only joined together at the seams by either gluing the turf on top of wide seaming tape or by sewing the turf together. Both seaming methods are good and do not fail if properly done, but for scientific reasons, we think that glued seams are better than sewn seams. When glued, stress is distributed over the entire bond area of the "glue on tape" instead of just being concentrated at spaced holes along the seam where the sewing thread passes through two pieces of turf to hold it together.

Adhesive Importance - We don't claim to be smarter than other adhesive companies. However, we have over a quarter century head start developing sophisticated turf adhesives. Progress means future innovations, so we intend to both cause and/or adjust to the changes. However, from an adhesive standpoint, we already know for certain that:

The best synthetic turf; subsurface under it; and the best installers are of little value without the proper adhesives(s), whether the installation be a total gluedown or just adhesive bonded seams and inserts.

Types of Turf Adhesives - Because the adhesive selected for synthetic turf installations is extremely important, the information that follows should be both educational and helpful.

1) One Part High Green Strength (High Grab) Urethane Adhesives: These are the most widely used adhesives for installing synthetic turf. They are practical to handle under variable outdoor weather conditions, plus have a long history of proven outdoor durability. These type adhesives are more expensive in terms of cost/gallon or cost/kilo but not necessarily from a total job cost standpoint when speed of installation and less call backs are considered.

2) "Oily/slippery" One Part Urethanes as Opposed to High Grab Ones: They have little or no grab and green strength to hold the surfaces in place while the adhesive is curing. They also often foam excessively in high humidity. They are a variable weather nightmare.

3) Two Part Adhesives (Epoxy or Urethane): Great for many uses but for turf installations, we think they are "stone age technology" as compared to one part urethane adhesives. Reasons are: each component of these labor intensive adhesives by itself is not an adhesive. Hence, if they are not thoroughly and accurately mixed on the field, they can have poor durability which shows up after aging and weathering. Additionally, these adhesives have the common handling problems of being "oily and slippery" with no green strength (no grab), plus when used on very hot days, they have a short pot life and a short time outdoor working window. Oppositely, on cold days, they become very thick and hard to mix, plus they cure slowly, if at all.

4) Hot Melt Adhesives: They require special equipment for them to be used under variable outdoor weather conditions. Also, they may set too quickly when cold or too slowly when hot.

5) Water Based (Latex) adhesives: Low cost because part of the container is full of water. They depend on water evaporation so they often: dry too slow in high humidity; too fast in dry desert-like conditions; plus rainfall before they set can wash them away.

6) Private Label Adhesives: Our translation is that another company is making it for the buyer who can change it "at will" for low price or other purposes without the customer or specifier knowing.

by Norris Legue,
Synthetic Surfaces Inc.
Here is a listing of companies known to construct or renovate athletic fields:

**ABC Sports Turf**
Houston, TX  
281-493-3327  
www.abcsportsturf.com

**Alliza Sports Turf**
Alvaton, KY  
270-842-0473  
www.allizainc.com

**Alpine Services, Inc.**
Gaithersburg, MD  
800-292-8420  
www.alpineservices.com

**American Civil Constructors**
Littleton, CO  
303-795-2582  
www.acconstructors.com

**Architerra, PC**
Coopersburg, PA  
610-282-1398

**Athletic Construction, Inc.**
Oakwood, GA  
770-532-7337  
tlstrickland57@hotmail.com

**Athletic Fields, LLC**
Humboldt, TN  
866-287-4763

**Bigfoot Turf Farms**
LaSalle, CO  
800-632-7473  
www.bigfootturf.com

**Beals Alliance**
Sacramento, CA  
916-366-8350  
www.bealsalliance.com

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www.bigfootturf.com

**American Civil Constructors, Inc.**
Littleton, CO  
303-795-2582  
www.acconstructors.com

**Ballard Sports**
Cary, NC  
919-678-8440  
www.ballardsports.com

**Burnside Services**
Navasota, TX

**Carolina Green Corp.**
Indian Trail, NC  
866-753-1707  
www.cgcfields.com

**Championship Turf Surfaces**
Harwinton, CT  
860-685-0219  
www.turfchamps.com

**Charles Williams & Associates**
Fayetteville, TN  
800-544-8873  
www.cwasodfarm.com

**Clark Companies**
Delhi, NY  
607-746-2727  
www.clarkcompanies.com

**Colonial Landscape & Maintenance, Inc.**
Alviso, CA  
408-941-1090  
www.colonylandscape.com