

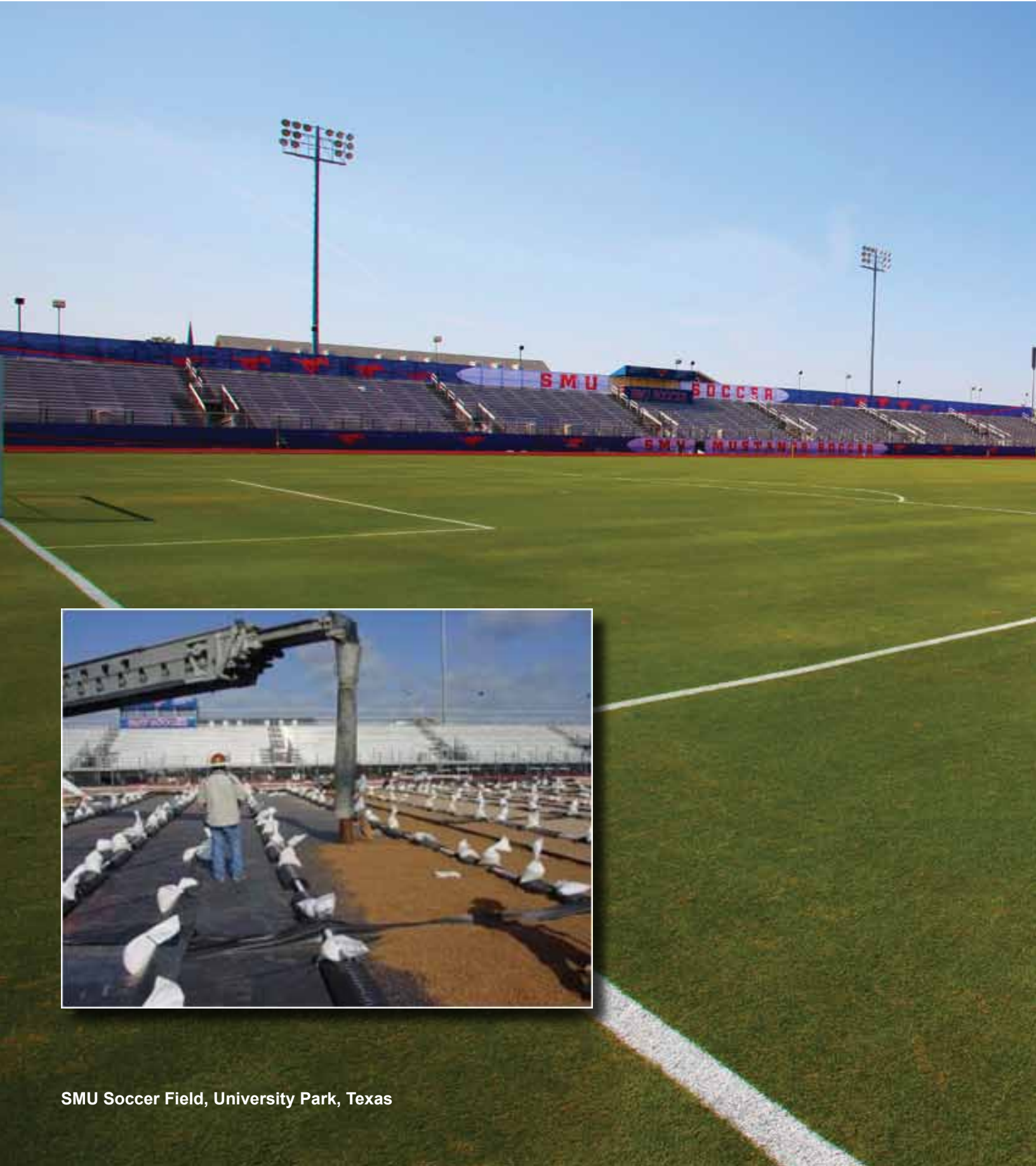


Firestone EPIC Chamber™ Systems for Sports Fields

Firestone
BUILDING PRODUCTS

EPIC CHAMBER™ SYSTEMS FOR SPORTS FIELDS

Superior Drainage • Reuse of Gray Water • Flat Field



SMU Soccer Field, University Park, Texas



Superior Drainage

Reuse of Gray Water

Flat Field



Athletic fields can be costly to create and maintain. Innovation in water management now enables playing fields to be irrigated from below the surface to maintain a perfect place for sports, parking or other uses. Firestone offers the Environmental Passive Integrated Chamber System (EPIC Chamber™ System) that is efficient, economical and long-lasting. The system combines passive subsurface irrigation, artificial turf cooling, water storage and filtration in a single, customizable solution.

Gravity pulls water downward through the ground and into the chambers and stores it for future use or discharge. Capillary rise pulls the water upward for irrigating natural turf or cooling artificial turf. This process controls water management for both natural sports fields and outdoor artificial turf allowing for more beautiful and safer playing surfaces.



Cooler Field Temperatures
Superior Drainage
Uniform Water Distribution



ARTIFICIAL TURF

Cooler Field Temperatures • Superior Drainage • Uniform Water Distribution



While artificial athletic fields increase usability and decrease maintenance and operation costs over natural grass fields, they offer little to no value as a stormwater management solution. There is also minimal temperature control with artificial turf, resulting in surface temperatures that may exceed 180 °F (82 °C). This excessive heat is a result of the sun's ultraviolet light reacting with compounds within each blade of the synthetic turf. This reaction between the UV rays and the turf cause the field temperatures to rise dramatically which could contribute to heat related health hazards for the athletes.

The EPIC System includes a damp field base that allows the heat to dissipate creating a natural cooling effect that can reduce field surface temperatures 20 °F or more on hot, sunny days. The EPIC System allows moisture to enter the sand-based infills from below grade for optimal cooling and playability.

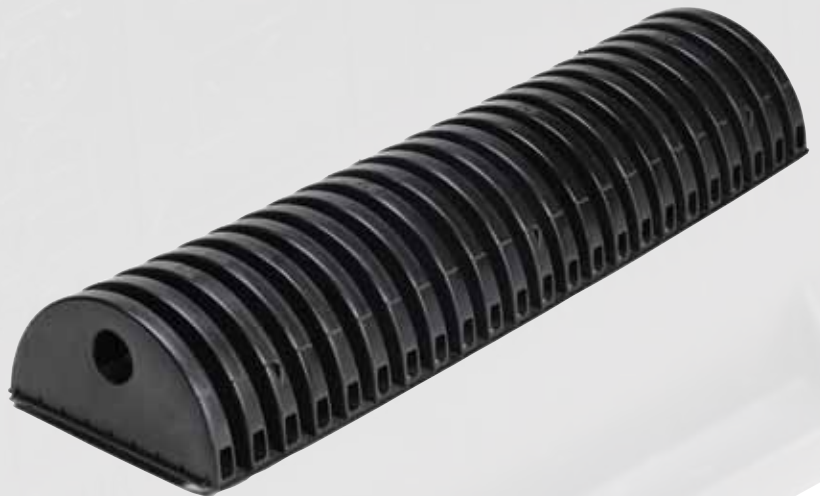
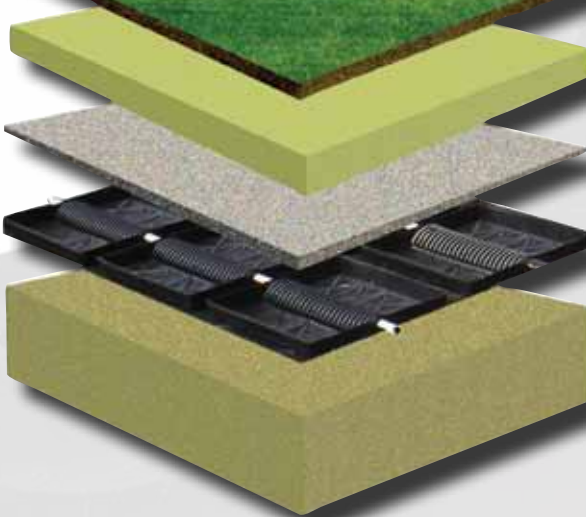


THE SOLUTION TO THE HEAT

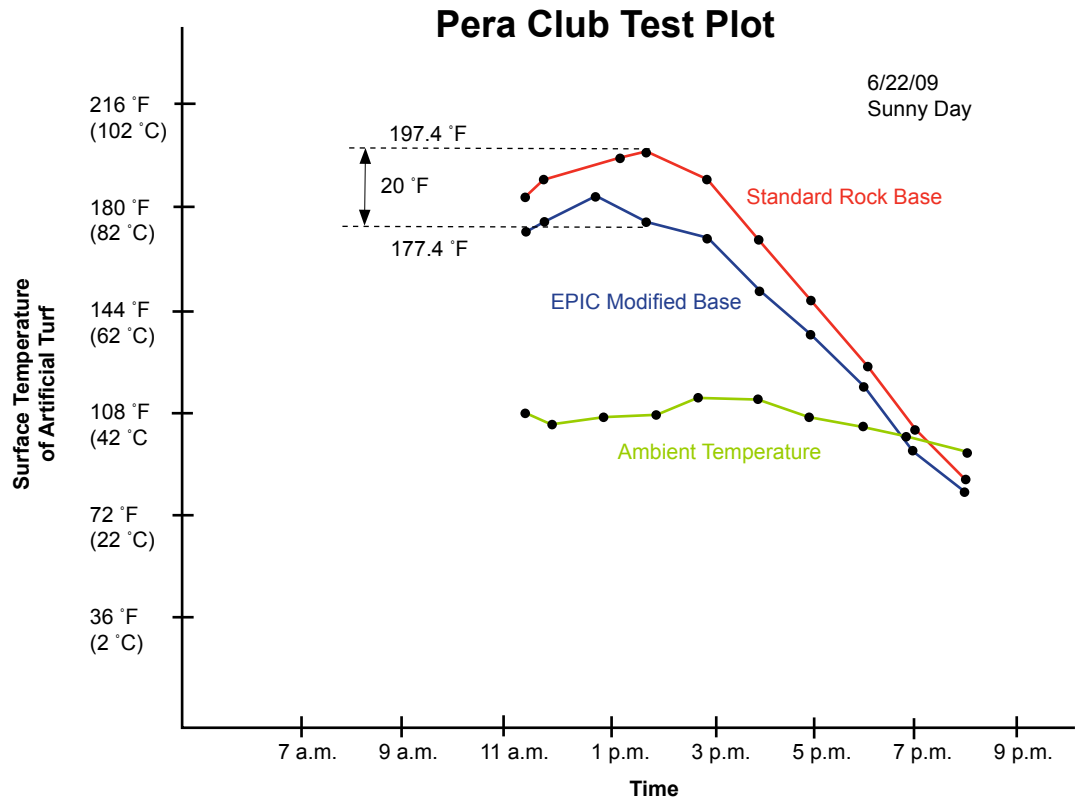
The largest negative feature of artificial turf surfaces is high temperature on sunny days. Various measurements and studies have demonstrated that temperature can quickly exceed 160 °F when ambient air temperatures of the surroundings are as low as 80 °F and even rise to above 180 °F when ambient air temperatures approach 90 °F on sunny days. Synthetic turf temperature studies have been conducted at top-rated universities to ensure the safety of their athletes. In 2002, one Brigham Young University study was prompted after one of the coaches received burns on the bottoms of his feet through his tennis shoes while holding a football camp on their newly installed synthetic turf practice field. This study showed the surface temperature of artificial turf is significantly higher than air or soil temperature. The hottest surface temperature recorded during this study was 200 °F on a 98 °F day.



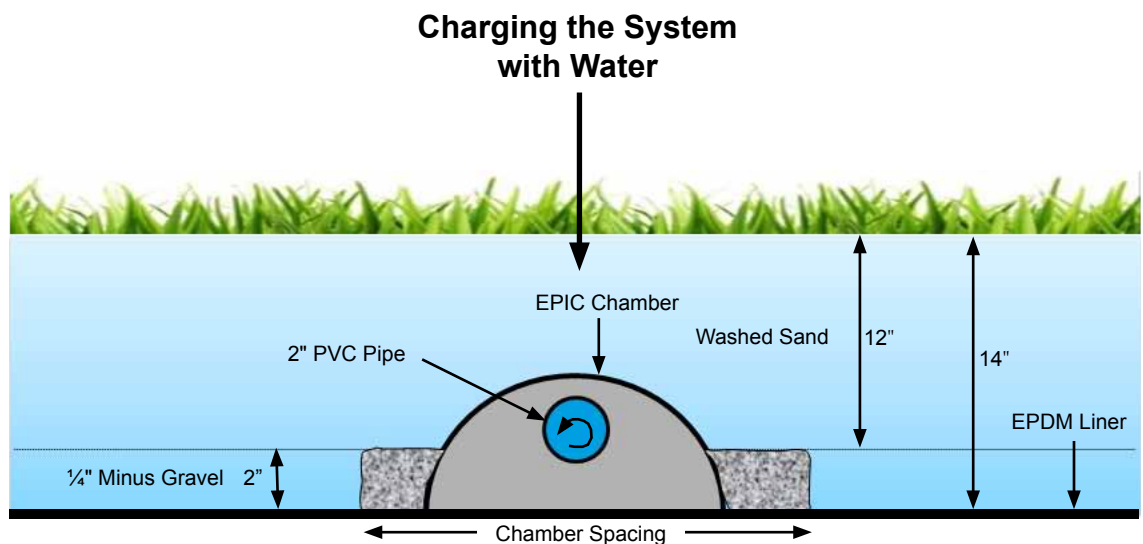
The Firestone EPIC Chamber System is a drainage and irrigation device that uses natural passive processes to manage and direct water resources.



This graph illustrates that Infrared temperatures (heat production) are significantly higher than the ambient temperature, but the EPIC base field is still 20 degrees lower than the turf over the standard rock base.



The EPIC Chamber System helps to manage stormwater runoff and can be used to dramatically cool the field when installed under an artificial turf field.



Turf care-takers know that heavy rain and standing water can wreak havoc on their fields, particularly during peak utilization periods. Irrigation inefficiency, inadequate drainage capacity, turf damage, soil compaction and pest infestation have serious implications on field availability, performance and turf health with natural grass designs. In addition to wear and tear, maintenance of traditional natural grass fields with conventional spray irrigation systems can require millions of gallons of water each year – a costly and inefficient use of water resources. Sub-irrigation systems that apply water laterally to the root zone from perforated tiles or emitters buried either close to the surface or just below the normal root penetration from beneath the surface (subsurface drip irrigation or sub-irrigation) have been shown to save abundant quantities of irrigation water compared to sprinkler systems & promote superior turf quality. (Leinaur and Makk, 2004).



Turf Quality

Water Conservation

Stormwater Management





TCF Bank Stadium Grounds, University of Minnesota

The substantial drainage and filtration capabilities of the EPIC System can be installed beneath an athletic field, promoting efficient land and water use while mitigating turf issues. The system recycles stormwater run-off and gray water without exposure above ground. The EPIC System filters and distributes the water with an underground controlled release that increases grass growth, resulting in enhanced turf quality at a lower cost.

"From a sustainability standpoint, we are able to reduce our need and related costs for irrigation because the roots from the turf pull water up through the sand profile," said Doug Lauer, Landcare Supervisor for University of Minnesota, who installed the EPIC System on the green space outside of the stadium. "We also save money by eliminating the disposal of water down the storm sewer."

The system's natural filtration component requires minimal maintenance after installation. The specially designed profile filters total suspended solids and absorbs nitrates and phosphates. While the EPIC System can hold 122.24 liters/m² (3 gallons/ft²) of water, secondary detention systems can be installed beneath the chambers to collect and store excess water resulting from larger storm events. Depending on the location and application, this water management system uses 50-85% less water than conventional irrigation methods. The filtration system can also collect and recycle gray water onsite for subsurface irrigation.

Installing the EPIC Chamber™ System eliminated the need for a traditional retention pond outside the TCF Bank Stadium (pictured above). This solution was safer and much easier to maintain than a pond and these areas provide useable green space that is used for game-day media and concession parking.

NETLON™ ATS

Turf Strength & Quality • Stabilization • Resilience • Multi-Use/Parking



When Firestone Netlon ATS (Advanced Turf System) is added to the soil profile layer of the EPIC System, fields gain the ability to support heavier loads. Even in saturated turf conditions, the polypropylene mesh reinforces the medium above and gives the surface “memory,” allowing it to spring back to shape. This feature increases turf health and infiltration, prevents compaction, speeds event recovery and enhances recreational safety.

Cambria Grammar School in Cambria, CA features a soccer field that is used extensively by the surrounding community and is reinforced by Netlon ATS after consultants recommended Netlon ATS for long life and vitality of the field.

“I think the Netlon is pretty phenomenal - just the whole concept and how it works,” said Chris Adams, Superintendent of the Coast Unified School District which includes Cambria. “Two things stand out to me. The density of the grass is thicker, probably due to the pressure of the Netlon and the strength of the field. We have water tank issues, and we actually have to drive our water truck onto a field and do flood irrigation. The truck weighs about 20,000 pounds and no ruts occur in the field. It’s pretty impressive.”

When the Netlon ATS and EPIC System are combined, fields can provide multi-use sites, a resilient recreational space that provides superior drainage, stormwater management, and cooling for artificial turf or subsurface irrigation, as well as years of fun and enjoyment – rain or shine.



Turf Strength & Quality

Stabilization

Resilience

Multi-Use/Parking



Cambria Elementary School, Cambria, CA

Firestone

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Firestone Building Products

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