THE SCIENCE BEHIND THE SURFACE

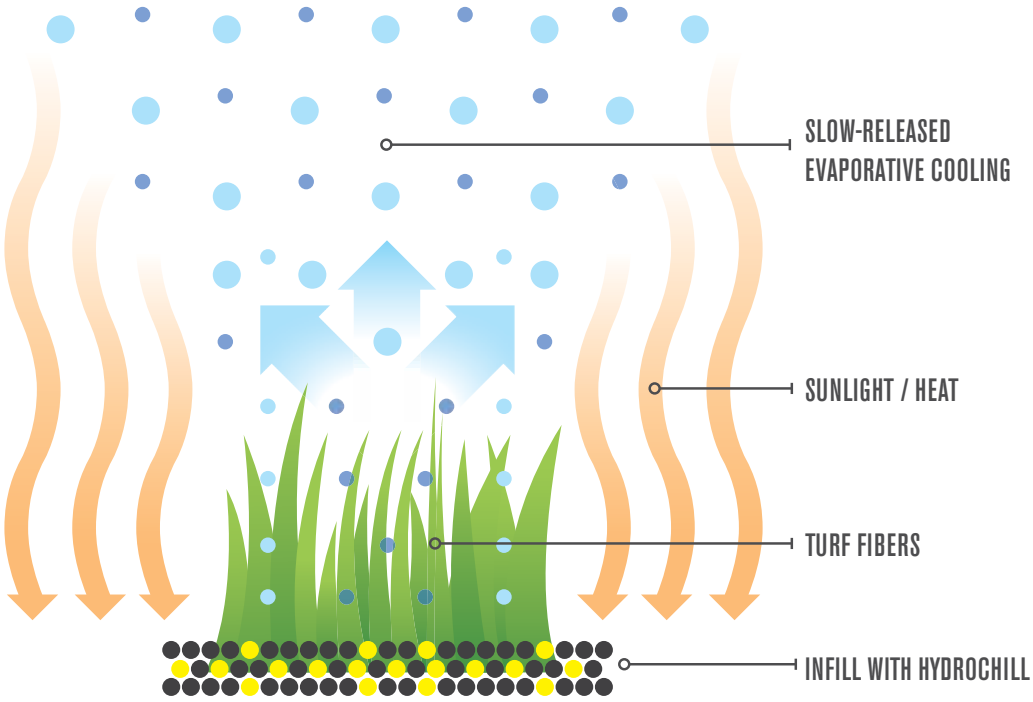
shaw SPORTS TURF

WHAT IS EVAPORATIVE COOLING?

Evaporative cooling is the process in which liquid evaporates, decreasing the temperature of the surface. For example, when athletes sweat moisture evaporates from the surface of their skin causing a cooling effect, which helps regulate body temperature.

The Cooling Process

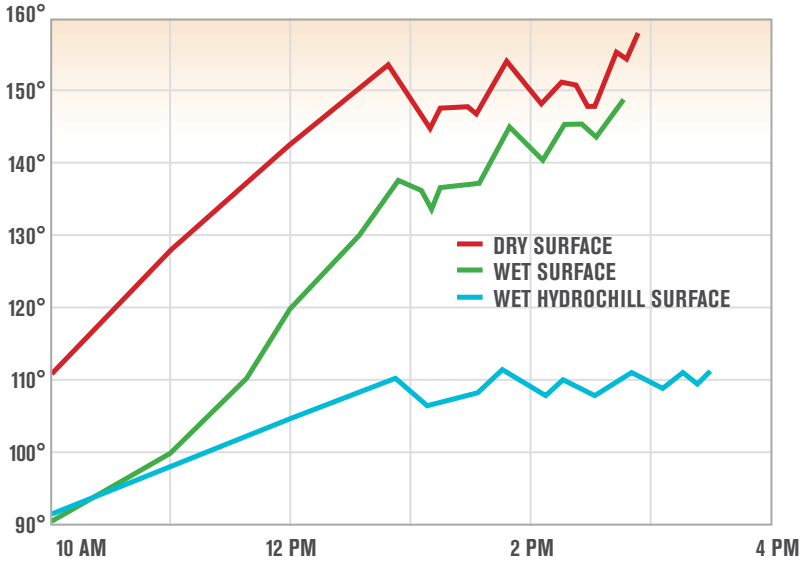
Heat and evaporation are key components to understanding the evaporative cooling process. Water can hold a lot of heat. The heat stored in water is known as latent heat. As water absorbs enough heat, it changes from liquid to gas, and it evaporates. When it leaves the surface as gas it takes the heat with it, resulting in decreased surface temperature.



HYDROCHILL®
EVAPORATIVE COOLING SYSTEM

HydroChill uses this same evaporative cooling process to cool the surface of artificial turf allowing for a more comfortable playing surface. During the summer months when the sun is directly overhead surfaces absorb more energy, which results in hotter surface temperatures. Studies have shown that a temperature difference of over 30 degrees provides a noticeable increase in the comfort level of a playing field. HydroChill studies have shown a difference of 50 degrees on outdoor fields providing a more comfortable surface for athletes.

THERMOCOUPLE TEST READINGS
FROM ACTUAL FULL-SIZED SYNTHETIC TURF FIELD

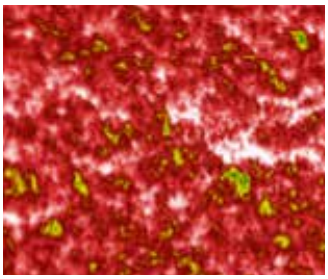


HYDROCHILL RESEARCH & DEVELOPMENT

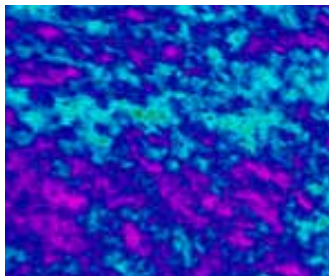
Extensive research on HydroChill has been conducted for nearly six years using laboratory testing and real-world applications involving HydroChill surfaces currently used by athletes. Shaw Sports Turf conducts their research in a lab dedicated to the study of the effects of heat on turf. Their testing facility houses a custom-built solar simulator with a watering mechanism that simulates rainfall. This allows for year-round testing.

Tests were also conducted on a variety of outdoor surfaces using a thermocouple, a sensor used to measure temperature. The thermocouple consists of two wire legs welded together to make a junction. When the junction experiences a change in temperature a voltage is created. The voltage is then translated using a thermocouple reference table to calculate the temperature.

FLIR (FORWARD LOOKING INFRARED) READING
standard synthetic surface vs. HydroChill



DRY SURFACE



HYDROCHILL

Outdoor surface testing is also done using an infrared thermometer and a certified thermographer with a Forward Looking Infrared, or FLIR, camera. An infrared thermometer measures the temperature of a portion of radiation called blackbody radiation, which is emitted by the surface being measured. The FLIR is a night vision technology which takes a thermal image of surfaces to measure the temperature difference between surfaces. The images to the left compare the FLIR image of a dry surface compared to a HydroChill surface. Through research and testing, HydroChill has shown to be very effective in extreme temperatures.