Synthetic Turf Safety
Proven With Science
The Mother of Invention

The motivation for the invention of FieldTurf was twofold – improve the health and safety of players; and protect the planet.

When FieldTurf was just an idea, athletes were being beat up playing on the dangerous carpet surfaces of that era. Keeping grass fields in good condition required tons of harmful pesticides and chemicals, while irrigation wasted millions of gallons of clean water.

Health and safety was, is and always will be FieldTurf’s DNA. Because we don’t just make turf. We make a difference.

Over the past decade, our invention has improved player safety, reducing and preventing injuries around the globe. Our turf has eliminated millions of pounds of pesticides and harmful chemicals from the environment and saved billions of gallons of fresh water.

Recent news reports citing a possible link between crumb rubber and cancer have rightfully caused great concern to all. Unfortunately, these reports do not consider the decades of science studying exactly this subject.

Ongoing research continues the efforts to ensure that artificial playing fields reduce health and safety concerns. Not create them.

Before the acceptance of crumb rubber as an approved, safe, infill material for artificial turf, hundreds of studies had been commissioned and executed by health and safety experts worldwide.

The following pages look at some of their findings.
Crumb rubber, made from reclaimed tires, is an important part of the industry’s premiere infill option for synthetic turf fields. It has been safely used in many products since being introduced in the early 1990s, and in playgrounds and tracks for much longer. The notoriously resilient SBR rubber material provides enhanced durability and cushioning to prevent injuries and keeps playing surfaces safe. Aside from its use in synthetic turf sports fields, SBR (Styrene-butadiene) rubber, referred to as crumb rubber, is also used in a variety of products from children’s rubber toys to surgical gloves to food packaging, and even in chewing gum.

With the growing popularity of synthetic turf, questions have surfaced about the safety of the little black rubber pellets that protect our athletes. Hundreds of studies have been completed to understand any potential risks of artificial turf and its components. Government health ministries and environmental bodies in the U.S. and Europe have commissioned extensive research.

So have world health organizations, leading universities and independent scientific committees. Elected officials have reacted to the concerns of their constituents by commissioning studies to get the facts. The research has been done. The studies exist.

Read what the experts have said in independent testing, studies and reports on the potential health and environmental impact of artificial turf.
“The SVOCs identified based on library matches of their mass spectra were not present in toxicological databases evaluated and many are ubiquitous parts of consumer products. Similarly, the metal concentrations measured in field samples indicate that the risk would be de minimis among all populations expected to use artificial turf fields”

Brian T. Pavilonis, Clifford P. Weisel, Brian Buckley, and Paul J. Lioy., “Bioaccessibility and Risk Exposure to Metals and SVOC’s in Artificial Turf Field Fill Materials and Fibers (2013)”

“The uptake of PAH of football players active on artificial grass fields with rubber crumb infill is minimal. If there is any exposure, then the uptake is very limited and within the range of uptake of PAH from environmental sources and/or diet.”

Joost G. M. van Rooij, Frans J. Jongeneelen, “Hydroxypyrene in urine of football players after playing on artificial sports field with tire crumb infill (December 2008)”

“Genotoxicity testing of tire crumb samples following solvent extraction concluded that no DNA or chromosome-damaging chemicals were present. This suggests that ingestion of small amounts of tire crumb by small children will not result in an unacceptable hazard of contracting cancer.”

Enviro-Test Laboratories, Alberta Centre for Injury Control and Research, Department of Public Health Sciences, July 2003, ‘Toxicological Evaluation for the Hazard Assessment of Tire Crumb for Use in Public Playgrounds’

“Based upon the current evidence, a public health risk appears unlikely. A variety of governmental bodies including Norway, Sweden, New Jersey and California have recently reviewed the health issues; their assessments have not found a public health threat. Sources of exposure unrelated to artificial turf fields are likely more important than the turf fields for many chemicals.”


“Based on the minimal concentrations of chemicals detected, it is considered very unlikely that any significant adverse vapor (inhalation) exposures would occur to humans in close proximity to where crumb rubber is used in outdoor applications.”

New Jersey Department of Environmental Protection, Division of Science, Research, and Technology, June 2007, ‘Environmental Assessment and Risk Analysis - Preliminary Assessment of the Toxicity from Exposure to Crumb Rubber: its use in Playgrounds and Artificial Turf Playing Fields’

“Two studies, one in California and one at Rutgers University did evaluate the cancer risk if children ingested a mouthable chunk of playground rubber (10 gram), using laboratory extraction methods to estimate the amount of chemicals that might become available in the stomach and absorbed into the body. Both studies found very low cancer risk from this scenario (Cal OEHHA 2007; Pavilonis et al. 2014). Thus, CT DPH finds no scientific support for a finding of elevated cancer risk from inhalation or ingestion of chemicals derived from recycled tires used on artificial turf fields.”

State of Connecticut Dept of Health - Brian Toal, Gary Ginsberg - Environmental and Occupational Health Assessment, Jan 2015
“Tire crumb does not contain chemicals with high vapour pressures, exposure via inhalation deemed low risk. Oral ingestion deemed low risk because ingestion not likely, furthermore, question of how effective stomach acids and enzymes are at extracting toxic chemicals from tire crumb and transporting them into the bloodstream.”

D.A. Birkholz, Director, Research & Development, ALS Laboratory Group, Edmonton, Alberta, October 2006, ‘Assessing the Health and Environmental Impact from the Use of End-of-Life Tire Rubber Crumb as Artificial Turf in Sports Arenas’

“Based on the available literature on exposure to rubber crumb by swallowing, inhalation and skin contact and our experimental investigations on skin contact we conclude that there is not a significant health risk due to the presence of rubber infill from used car tyres.”

INTRON, commissioned by two tyre associations, and supervised by the National Institute for Public Health and the Environment and by the Ministry of Housing, Spatial Planning and the Environment in the Netherlands, April 2008, ‘Follow-up study of the environmental aspects of rubber infill’

“Dermal exposure deemed low risk because carrier solvent is needed to extract toxic chemicals from tire crumb and to penetrate protective skin layers”

D.A. Birkholz, Director, Research & Development, ALS Laboratory Group, Edmonton, Alberta, October 2006, ‘Assessing the Health and Environmental Impact from the Use of End-of-Life Tire Rubber Crumb as Artificial Turf in Sports Arenas’

“The uptake of PAH by athletes who have contact with crumb rubber synthetic turf is negligible. As far as dermal contact is concerned, the Norwegian Institute of Public Health and Radium Hospital (2006) carried out an extensive analysis of possible health concerns. The study found that there was no evidence to suggest that allergic reactions were caused by exposure to crumb rubber and speculated that latex in car tires was either - less available for uptake or was - deactivated as an allergen.”

University of California, Berkeley and the Corporation for Manufacturing Excellence (Manex), February 2010, ‘Review of the Impacts of Crumb Rubber in Artificial Turf Applications’

‘there is not a significant health risk due to the presence of rubber infill’
“Levels of chemicals in the air at synthetic turf fields do not raise a significant health concern.”


“Twenty air samples were collected above and around two synthetic turf playing surfaces in Connecticut. Ten of the samples were analyzed for volatile nitrosamine content and 10 were analyzed for benzothiazole and 4-(tert-octyl) phenol content. The samples were collected on warm, late summer days during periods of light to calm winds. In one case, the synthetic turf surface had been groomed three days prior to the sampling. The sampling was conducted during periods when the temperature of the crumb rubber in-fill material was elevated due to exposure to the sun. The combination of air temperatures, surface temperatures, wind speed and, the recent maintenance of one of the fields, are believed to be conditions favorable for generating maximum concentrations of the analytes in the air column above and around the playing surfaces. This study determined that under favorable conditions for vapor generation, no detectable concentrations of volatile nitrosamines or 4-(tert-octyl) phenol existed in the air column at a height of four feet above the tested synthetic playing surfaces or in the air either upwind or downwind of the fields.”


“The majority of the studies have been on higher surface area particles and have concluded they are currently acceptable. Therefore the larger granules used in artificial turf will have even less potential for emissions. For example a study undertaken by the Danish Ministry of the Environment concluded that the health risk on children’s playgrounds that contained both worn tyres and granulate rubber was insignificant. The available body of research does not substantiate the assumption that cancer resulting from exposure to SBR granulate infills in artificial turf could potentially occur.”

*Prof. Dr. Jiri Dvorak, FIFA, July 2006, ‘An Open Letter concerning the potential cancer risk from certain granulate infills from artificial turf’*

“It is unlikely that any losses could occur to air or water in concentrations that would pose serious human or environmental risk. This opinion is supported by the reports and academic studies reviewed, which have shown insignificant environmental effects of such chemicals or release of volatiles and particulates into the atmosphere.”

*British Standards Institute (BSI), the Sports and Play Construction Association (SAPCA), March 2007, ‘Twenty Questions [and Answers] on Rubber Granulate’*
“The results of the INERIS Health Risk Evaluation, based on the concentration of the substances and worst-case scenarios, indicate that the VOC and aldehyde emissions from the three types of artificial grass fields studied in small and poorly ventilated indoor gymnasium situations are of no cause for concern for human health, for the workers installing the surfaces as well as for the general public, professional or amateur athletes, adults and children. In conclusion to its study, the INERIS stipulates that the health risks associated with the inhalation of VOC and aldehydes emitted by artificial grass fields in outdoor situations give no cause for concern towards human health.”

Aliapur & Ademe (Environmental French Agency), 2007, ‘Environmental and Health Evaluation of the Use of Elastomer Granulates (Virgin and from Used Tyres) as Filling in Third-Generation Artificial Turf’

“We found there to be very little exposure of any substances, carcinogenic or not, in the vapors and dust that these fields generate under active use, summer conditions. Background levels of chemicals in urban and suburban air from heating sources and automobile traffic are much more significant sources of airborne carcinogens.”

State of Connecticut Dept of Health - Brian Toal, Gary Ginsberg - Environmental and Occupational Health Assessment, Jan 2015
“The artificial (FieldTurf) field at Tabor Academy does not pose a threat to water quality or aquatic life. Water samples taken from the field in 2013 were tested for arsenic, cadmium, chromium, lead, mercury and zinc.”

*Camp, Dresser, McKee and Smith, Inc*, “Tabor Academy – Synthetic Turf Athletic Field Evaluation (March 2014)”

“There is no significant threat from chemicals leaching into surface water and groundwater. While some chemicals can be released from crumb rubber over time, they are in small concentrations and are reduced by absorption, degradation and dilution - resulting in no significant impact on groundwater or surface water.”


“The evaluation of the stormwater drainage quality from synthetic turf athletic fields included the collection and analysis of eight water samples over a period of approximately one year from three different fields, the collection and analysis of samples of crumb rubber in-fill from the same three fields plus a sample of raw crumb rubber obtained from the manufacturer, and the evaluation of the effect of the stone base material on the pH of the drainage water. The results of the study indicate that the actual stormwater drainage from the fields allows for the complete survival of the test species called Daphnia pulex. An analysis of the concentration of metals in the actual drainage water indicates that metals do not leach in amounts that would be considered a risk to aquatic life as compared to existing water quality standards. Analysis of the laboratory based leaching potential of metals in accordance with acceptable EPA methods indicates that metals will leach from the crumb rubber but in concentrations that are within ranges that could be expected to leach from native soil.”


“Given that undiluted runoff is not likely and that three months is an outside estimate of the duration of toxicity, it is doubtful that tire crumb would present a significant risk of contamination in receiving surface waters or groundwater.”

*Enviro-Test Laboratories, Alberta Centre for Injury Control and Research, Department of Public Health Sciences, July 2003, ‘Toxicological Evaluation for the Hazard Assessment of Tire Crumb for Use in Public Playgrounds’*

“Several recent studies explored this concern in great depth and found no basis for health or environmental concern due to leaching of hazardous materials from synthetic turf installations, similar to the one at Maple Park. REAC believes that there is sufficient evidence to support the conclusion that the field design at Maple Park poses no risk to the local environment in Ridgewood.”

*Ridgewood Environmental Advisory Committee (REAC) January-October 2009, ‘Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ’*
“The SVOCs identified based on library matches of their mass spectra were not present in toxicological databases evaluated and many are ubiquitous parts of consumer products. Similarly, the metal concentrations measured in field samples indicate that the risk would be de minimis among all populations expected to use artificial turf fields.”

Brian T. Pavilonis, Clifford P. Weisel, Brian Buckley, and Paul J. Lioy., “Bioaccessibility and Risk Exposure to Metals and SVOC’s in Artificial Turf Field Fill Materials and Fibers (2013)”

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Joost G. M. van Rooij, Frans J. Jongeneelen, “Hydroxypyrene in urine of football players after playing on artificial sports field with tire crumb infill (December 2008)”

“…risk is well below the di minimis level of 1 x 10^-6 (one in one million), generally considered an acceptable cancer risk due to its small magnitude compared to the overall cancer rate”


“Genotoxicity testing of tire crumb samples following solvent extraction concluded that no DNA or chromosome-damaging chemicals were present. This suggests that ingestion of small amounts of tire crumb by small children will not result in an unacceptable hazard of contracting cancer.”

Enviro-Test Laboratories, Alberta Centre for Injury Control and Research, Department of Public Health Sciences “Toxicological Evaluation for the Hazard Assessment of Tire Crumb for Use in Public Playgrounds (July 2003)”

“The uptake of PAH by athletes who have contact with crumb rubber synthetic turf is negligible.”

University of California, Berkeley and the Corporation for Manufacturing Excellence (Manex), “Review of the Impacts of Crumb Rubber in Artificial Turf Applications (February 2010)”

“Based upon the information reviewed on PAH exposure in humans and the results of the PAH air testing performed by J.C. Broderick & Associates, the potential for exposure to PAHs during normal use of the athletic field at Schreiber and Comsewogue appears to be minimal or insignificant.”

J.C. Broderick & Associates, commissioned by Schreiber High School and Comsewogue High School (NY), October 2007, ‘Ambient Air Sampling for PAH’s’

“The studies to date have concluded that PAHs (Polynuclear Aromatic Hydrocarbons) are not released or at most negligibly released from tyre abradate (The University of Dortmund Institute for Environmental Research 1997). Epidemiological studies conducted by the Health Effects Institute, The World Health Organisation and other investigators do not implicate tyre wear particles in ambient air as contributing to human health effects (respiratory and cardiovascular diseases).”

Prof. Dr. Jiri Dvorak, FIFA, July 2006, ‘An Open Letter concerning the potential cancer risk from certain granulate infills from artificial turf’
“The majority of the studies have been on higher surface area particles and have concluded they are currently acceptable. Therefore the larger granules used in artificial turf will have even less potential for emissions. For example a study undertaken by the Danish Ministry of the Environment concluded that the health risk on children’s playgrounds that contained both worn tyres and granulate rubber was insignificant. The available body of research does not substantiate the assumption that cancer resulting from exposure to SBR granulate infills in artificial turf could potentially occur.”

Prof. Dr. Jiri Dvorak, FIFA, July 2006, ‘An Open Letter concerning the potential cancer risk from certain granulate infills from artificial turf’

“No significant differences were found between artificial football fields and urban sites. No differences were found between artificial football fields and “natural” football fields. There would not be any more risk on an artificial turf football field than there would be in the rest of the city.”

Università degli Studi di Torino “Artificial Turf Football Fields: Environmental and Mutagenicity Assessment (July 2012) ”

“Overall, then, for several reasons, I find no reliable basis for the notion that crumb rubber in-filled synthetic turf fields pose a significant risk of cancer. Several groups of investigators, from academia, government, and consulting firms, have performed environmental monitoring and/or modeling studies of crumb rubber and synthetic turf fields, and have reached the same conclusion.”

Laura C. Green, Ph.D., D.A.B.T., Consulting Toxicologist “Assessment of recent media reports of cancer among soccer players using synthetic turf fields (March 2014)”

“The Connecticut Department of Public Health has evaluated the potential exposures and risks from athletic use of artificial turf fields. Our study of 5 fields in Connecticut in 2010-2011 was a comprehensive investigation of releases from the fields during active play. This study was conducted as a joint project with the CT DEEP and the University of CT Health Center and was peer-reviewed by the Connecticut Academy of Science and Engineering. Our study did not find a large amount of vapor or particle release from the fields confirming prior reports from Europe and the US.”

“We put these exposures into a public health context by performing a risk assessment. Our risk assessment did not find elevated cancer risk.”

State of Connecticut Dept of Health - Brian Toal, Gary Ginsberg - Environmental and Occupational Health Assessment, Jan 2015

Noted toxicologist Laura C. Green, Ph.d., recent addressed the recently reported “Yale Study” from Connecticut non-profit group Environment and Human Health, Inc (EHHI).

“For many reasons, the EHHI/Yale study does not demonstrate that rubber mulch or crumb rubber pose a significant risk of cancer (or other diseases).”

“First, the study has not been published (or released in any complete form) nor, to my knowledge, has it been peer reviewed. In fact, contrary to the press release, the study does not appear to have been written up in even an unpublished manuscript. At my request, Nancy Alderman of EHH was kind enough to supply me with a summary of some of the methods and a spreadsheet of the results to date: I have attached these materials to this memorandum.”
“Second, as far as I can tell, the summary results presented are entirely non-quantitative: there is no indication of the concentrations of any of the detected chemicals, let alone is there any attempt to assess levels of exposure or doses potentially received by children or others playing on or near rubber mulch or crumb rubber. Accordingly, there is no way to judge the degree to which any such exposures might be risky. Since all of us eat, drink, and otherwise contact at least trace levels of many carcinogens daily, it is crucial to be quantitative when assessing cancer-risks (and then acting upon those assessments). Absent at least semi-quantitative estimates of risk, informed judgments simply cannot be made.”

“Third, to the summary of the study-methods, the chemicals were detected in methylene chloride extracts of a mixture of ground and ungrounded crumb rubber or rubber mulch — but methylene chloride extraction is not a relevant or reliable means of assessing how rubber mulch in playgrounds might become solubilized or otherwise release chemicals that could then be absorbed across a child’s skin, for example, or across a child’s digestive tract (were he or she to ingest some rubber). For purposes of human health risk assessment, instead of using a non-biological solvent such as methylene chloride, one should use simulated sweat or simulated gastric fluid, as used in the published, peer-reviewed study by Pavilonis et al., 2014, for example, cited above.”

“Fourth, EHHI reports that eight of the chemicals detected in the methylene chloride extracts of at least one of the nine samples of mulch are “probable carcinogens” (there were another five samples of “infill” that are not considered here) — but none of these eight chemicals is so categorized by authoritative bodies, such as the International Agency for Research on Cancer (IARC), the U.S. National Toxicology Program (NTP), or the U.S. Environmental Protection Agency (EPA). Moreover, not one of the putative “probable carcinogens” is consistently detected in the samples of mulch.”

“For example, EHHI lists pyrene (detected in seven of the nine samples) as a carcinogen, but no rodent bioassays of pyrene are in fact positive; and, per U.S. EPA, “Overall, the database for pyrene is substantial, and the weight of evidence suggests that this PAH is not carcinogenic” (EPA--635--R--08--012A). Not surprisingly, then, neither IARC nor NTP lists pyrene as either known or a probable human carcinogen (See Here). Similarly, EHHI lists heptadecane (detected in one of the samples) as a carcinogen, but no rodent bioassays indicate that heptadecane is carcinogenic, and it is not listed as a carcinogen by either IARC or NTP. EHHI lists phthalamide as a carcinogen, but the NTP bioassays for phthalamide yielded negative results in male and female rats and mice, and it is not listed as a carcinogen by either IARC or NTP.”

“And EHHI lists 9,10—dimethylanthracene, fluoranthene, phenanthrene, 4—(1,1,3,3—tetramethylbutyl)—phenol, and 1—methylpyrene as carcinogens; but, again not one of these five chemicals is listed as a carcinogen by either IARC or NTP.”

“Finally, I would note that the chemicals butadiene and benzene were not detected in this EHHI/Yale study. Recall that these two chemicals are indeed established causes of cancer in humans, and that EHHI had hypothesized that both are present — and presumably bioavailable — at significant concentrations in crumb rubber and rubber mulch. I would add that the elevated temperatures used to dry and to analyze the samples would likely have obscured the presence of either compound, but it remains the case that the causal hypothesis raised by EHHI has yet to be supported by actual data or other reliable evidence.”

Laura C. Green, Ph.D., D.A.B.T., Consulting Toxicologist
June 29, 2015
The spread of MRSA has prompted parents and other concerned citizens to rightfully question why their children are getting sick. Recent research has proven that synthetic turf does not play a role in promoting MRSA/staph and the concerns are often brought on by companies or lobbyists with a vested interest in anti-microbial products.

Research at Penn State confirms that Staph is not an issue on turf and that natural grass harbors more bacteria.

http://plantscience.psu.edu/research/centers/ssrc/research/synthetic-turf-research-penn-state

In conclusion, there are generally lower numbers of total microbes present in the infill or fibers of the synthetic turf systems tested compared to natural turfgrass rootzones and Staphylococcus aureus bacterium were not found on any of the playing surfaces. Staphylococcus aureus bacterium were found on towels and other devices used by athletes.

Under non-extreme temperature and very limited light conditions present during the indoor portion of this study, S. aureus survived on both synthetic and natural turfgrass for multiple days. However, the bacteria do not appear to thrive under these conditions as the numbers of surviving bacteria decrease significantly with time.


Based on the findings of the S. aureus survey, concern that infilled synthetic turf harbours and provides a breeding ground for S. aureus bacteria is unwarranted within the context of this study. S. aureus bacteria were found on a number of surfaces that athletes commonly come into contact with, such as towels and blocking pads; however, the tested synthetic turf did not contain any S. aureus. It is important to note that synthetic turf is more abrasive than natural turf grass and, as a result, breaks in the skin are more common, creating a pathway for infection when in contact with an infected surface.

The “Recommended Practices for the Maintenance of Infill Surfaces for NFL Games” states that “Clubs should not use antimicrobial agents on infill turf surfaces. The medical and scientific communities have not documented any benefit of using such agents on infill turf surfaces and there may be potential disbenefit to doing so.”

RP 4: Anti-Bacterial Agents Recommendation recap:

The Centers for Disease Control and Prevention (CDC) does not recognize infill turf as a significant source of MRSA infections. [See Appendix E] As the CDC has stated “[t]here is a lack of evidence that large-scale use (e.g., spraying or fogging rooms or surfaces) of disinfectants will prevent MRSA infections more effectively than a more targeted approach of cleaning frequently-touched surfaces.” [See Appendix E] This RP should not be interpreted as preventing the use of cleansing agents such as detergents and soaps to clean infill turf surfaces provided that such cleaning is performed in accordance with the recommendations of the applicable turf and cleaning agent manufacturers.
References on the Use of Anti-Bacterial Agents:


“Outbreaks of antibiotic-resistant strains of staph last year gained significant media attention, resulting in the temporary closing of school buildings and athletic facilities. Our research found that infilled synthetic turf systems do not harbor significant populations of staph bacteria to warrant concern.”

Dr. Andrew McNitt, Associate Professor of Soil Science at Penn State University, June 2007, ‘A Survey of Microbial Populations in Infilled Synthetic Turf Fields’

The California EPA’s Office of Environmental Health Hazard Assessment conducted a review of available literature entitled, Chemicals and Particulates in the Air Above the New Generation of Artificial Turf Playing Fields, and Artificial Turf as a Risk Factor for Infection by Methicillin-Resistant Staphylococcus Aureus (MRSA). The review concluded that “there is a negligible human health risk from inhaling the air above synthetic turf and it is unlikely that the new generation of artificial turf is itself a source of MRSA.”


“This confirms what we thought all along,” Cole said. “The speed with which we obtained the results is a testament to how clean things are there.”

Allegheny County Health Department, October 2007

“There is no data to suggest that turf will ever spread MRSA. We sampled the turf for the Rams’ investigation and didn’t find it. We actually observed the game. We mapped where the contact on the turf occurred. We sampled those areas where the players were tackled. And then we sampled areas where there wasn’t any direct contact to the turf. We didn’t find any Staph or MRSA.”

Jeff Hageman, Centers for Disease Control, May 2006
“In the outbreaks of MRSA, the environment has not played a significant role in the transmission of MRSA. MRSA is transmitted most frequently by direct skin-to-skin contact. You can protect yourself from infections by practicing good hygiene (e.g., keeping your hands clean by washing with soap and water or using an alcohol-based hand rub and showering after working out); covering any open skin area such as abrasions or cuts with a clean dry bandage; avoiding sharing personal items such as towels or razors; using a barrier (e.g., clothing or a towel) between your skin and shared equipment; and wiping surfaces of equipment before and after use.”

_Centers for Disease Control, February 2005_

“We have an injury reporting tracking system and it’s limited by sample size, but we haven’t had any linkage to turf,” said the NCAA’s David Klossner. “I know there have been some reports in the media. The CDC continues to tell us that the turf is not a harbor for this MRSA/staph infection. And if things are handled appropriately as far as hygiene practices, common sense, and wound cleaning and coverage, then a lot of these things can be prevented.”

_NCAA Director of Health and Safety, David Klossner, November 2006_

“MRSA infection has never been reported in connection with the synthetic surface at Maple Park or similar field designs. Several studies have proven that there is no connection between current generation synthetic surfaces and MRSA infections.”

_Ridgewood Environmental Advisory Committee (REAC) January-October 2009, ‘Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ’_

The spread of MRSA has prompted parents and other concerned citizens to rightfully question why their children are getting sick. Recent research has proven that synthetic turf does not play a role in promoting MRSA/staph and the concerns are often brought on by companies or lobbyists with a vested interest in anti-microbial products.
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http://plantscience.psu.edu/research/centers/ssrc/research/synthetic-turf-research-penn-state

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The “Recommended Practices for the Maintenance of Infill Surfaces for NFL Games” states that “Clubs should not use antimicrobial agents on infill turf surfaces. The medical and scientific communities have not documented any benefit of using such agents on infill turf surfaces and there may be potential disbenefit to doing so.”
In most climates, heat on synthetic turf fields is not an issue. But on a hot summer day, things outside can get hot.

Dr. Andy McNitt, head of the Penn State Center for Sports Surface Research, advises trainers to be aware of the heat when practicing in the summer on clear days. He recommends cutting down on practice times, considering pulling players off fields earlier and taking more breaks to cool down.

Collected data indicated that the air temperature as measured at a distance of two feet above the synthetic turf surface ranged from one to five degrees greater than the observed ambient air temperature, while the temperature at the same height above the natural turf ranged from 3° F lower to 1° F greater than the ambient air temperature. The measured air temperature at a height of five feet above the synthetic turf more closely approximated the ambient air temperature. Measured air temperatures ranged from 2° F lower to 2° F greater than the ambient air temperature.

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“The results of the temperature measurements obtained from the fields studied in Connecticut indicate that solar heating of the materials used in the construction of synthetic turf playing surfaces does occur and is most pronounced in the polyethylene and polypropylene fibers used to replicate natural grass, rather than the crumb rubber particles. Rapid cooling of the fibers was noted if the sunlight was interrupted or filtered by clouds. Significant cooling was also noted if water was applied to the synthetic fibers in quantities as low as one ounce per square foot. The elevated temperatures noted for the fibers generally resulted in an air temperature increase of less than five degrees even during periods of calm to low winds.”

Milone & MacBroom, engineering, landscape architecture, and environmental science firm based in Connecticut
“The study entitled ‘Incidence, Mechanisms, and Severity of Game-Related College Football Injuries on FieldTurf versus Natural Grass - A Three Year Prospective Study’, shows that there were double the amount of heat-related illnesses on natural grass playing surfaces compared with FieldTurf artificial turf fields.”

Michael C. Meyers, PhD, FACSM, Department of Health and Human Development Montana State University

“The ambient air above both surfaces differed by only 3°F at 12” above the surface and approximately 2°F at 39” (the approximate chest height of a typical youth athlete). The differences in the ambient air were undetectable without a thermometer. In both cases, the ambient air temperature above the surfaces was slightly higher than the general air temperature.”

Ridgewood Environmental Advisory Committee (REAC) January-October 2009, ‘Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ’
In April 2008, some synthetic turf fields in New Jersey were shut down by the New Jersey Department of Health and Senior Services for elevated levels of lead. However, test results have since indicated there was no lead in the air, soil or in the dust created by the removal of one of the fields.

Both fields were subsequently re-opened.

Lead chromate is not lead carbonate, the lead formerly found in paint. This inorganic substance is used to color the synthetic turf fiber. In synthetic turf, the silica-coated, encapsulated pigment particles are used to improve performance characteristics and reduce toxicity. Bioavailability of lead from pigment is extremely low. It is almost completely insoluble, not an inhalation hazard and not readily absorbed by the body if ingested.

“In July 2008, a U.S. Product Safety Commission staff report concluded that synthetic turf fields are OK to install and play on for people of all ages. The evaluation of older and newer synthetic turf fields concluded that ‘young children are not at risk from exposure to lead in these fields.’ The report showed that newer fields had no lead or generally had the lowest lead levels. Although small amounts of lead were detected on the surface of some older fields, none of the tested fields released amounts of lead that would be harmful to children.”

U.S. Consumer Product Safety Commission, July 2008, “CPSC Staff Finds Synthetic Turf Fields OK to Install, OK to Play On”

“Testing on FieldTurf fields have consistently shown 10-20 ppms or less than 5% of the lead level regarded as problematic. No cases of elevated blood lead levels in children have been linked to artificial turf on athletic fields in New Jersey and elsewhere.”

Center for Disease Control (CDC), June 2008, “Potential Exposure to Lead in Artificial Turf: Public Health Issues, Actions, and Recommendations”

“Based on existing HUD Guidelines and EPA standards, lead hazard risk assessments at these four DPR synthetic turf fields did not identify lead hazards.”

New York City Department of Health and Mental Hygiene, January 2008

“Lead chromate levels are well below that necessary to cause harm to children and athletes using the popular playing field surfaces. No acute health risks due to use of artificial turf fields, and risks due to chronic and repeated exposure are unlikely.”

New Jersey Department of Health and Senior Services (NJDHSS), April 2008

“A sample of stormwater was collected from the drainage system of two fields on April 28, 2008, and July 24, 2008, respectively. The results showed that lead was not detected in the drainage from either field.”

Milone & MacBroom, engineering, landscape architecture, and environmental science firm based in Connecticut, December 2008, ‘Evaluation of the Environmental Effects of Synthetic Turf Athletic Fields’

“Because the lead chromate is encapsulated in the fibers, it is presumed not to be bioavailable (is not released through contact) and cannot be absorbed by humans or other living systems. Research shows that contact with, or incidental ingestion of, the fibers or rubber infill poses no health risk.”

Ridgewood Environmental Advisory Committee (REAC) January-October 2009, ‘Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ’
“The studies acknowledge that turf field materials contain hazardous constituents and that the public, notably children, are in contact with these hazardous constituents. What has not been demonstrated, however, is an exposure pathway by which the constituents can enter the body of the field users and do damage or initiate disease. For a hazardous material to actually present a risk for the end user there has to be a pathway of exposure and a way for the chemical to do damage.”

“One of the chemicals proposed as a hazardous constituent of crumb rubber illustrates this point. Carbon black is classified by the IARC as possibly carcinogenic to humans. Most of the data available linking carbon black to cancer comes from occupational studies, where workers were exposed to high concentrations of fine carbon black dust for many years. The studies evaluated during this review did not document the presence of fine particulate or specifically identify carbon black. It appears likely that the carbon black in artificial turf/crumb rubber systems remains bound in the relatively large chunks of tire rubber, making it unavailable for distribution as a fine dust and therefore unavailable for uptake by the field users. Based on the scientific research, there is neither the dose, nor the exposure route, to indicate a health hazard for artificial turf/crumb rubber field users.”

“All studies acknowledge that additional data is needed to more fully assess potential exposures and possible health risks associate with the use of artificial turf fields with crumb rubber. In the meantime, leading public health agencies, such as the EPA and Consumer Product Safety Commission, are supporting continued use of artificial turf fields with crumb rubber.”

*Literature Review For Health Risks Associated With Artificial Turf / Crumb Rubber*

Elizabeth Black, CIH

*April 12, 2015*

“The lead levels that were discovered are isolated to the core samples of the turf, and did not appear in the samples of dust, wipes and blades of artificial grass taken from the field - in other words, the lead is encapsulated in the fibers inside the turf and not leaching out to the surface to be ingested.”

*Patrick Guilmette – PMT Group; premier environmental and consulting engineering firm in NY, NJ, CT, PA*
“If a green synthetic turf field containing lead chromate is still green, then the lead chromate is still in the yarn. If the Yellow Chromate had leached out, the field would likely be blue. Lead chromate is stable when encapsulated in the fiber into which it is extruded. Being encapsulated in the fiber, the lead in the lead chromate is not readily bio-available - meaning that even if the yarn breaks down, the lead in the complex compound which is lead chromate is not readily absorbed by the body.”

Dr. Davis Lee, Ph.D, Synthetic Organic Chemistry, Executive in Residence at the Georgia Institute of Technology School of Polymer, Textile, and Fiber Engineering, April 2008

“In interpreting the health risk from these results, it is important to recognize that people do not ingest the actual turf fibers. The NJ and EPA soil standards of 400 mg/kg are based on an assumption that small children may ingest approximately 100 mg of soil per day through hand to mouth activity. Thus, comparing the concentration of lead in the turf fiber to an acceptable soil lead concentration is not an accurate way to evaluate the human health risk from exposure to lead in turf fibers and is likely to overestimate risk, because the turf fiber is unlikely to be ingested (if at all) to the same extent as lead in soil.

The best way to evaluate exposure to lead on synthetic turf fields is to evaluate the dust present on the surface of the field. When people play on the field, they may get dust onto their hands or other exposed skin, and transfer the dust into their mouth through normal hand to mouth activity. Thus, the primary route of exposure we are concerned with is ingestion of dust. Lead has no appreciable absorption through the skin, and the inhalation of dust from the field is expected to be minimal, as any dust is likely to adhere to the turf fiber or rubber crumb padding rather than becoming airborne.”

Toxicologist Dr. Barbara D. Beck, a lecturer in Toxicology at Harvard; Former Chief of Air Toxics Staff in Region I EPA; Fellow, Interdisciplinary Programs in Health at the Harvard School of Public Health, May 2008

‘none of the tested fields released amounts of lead that would be harmful to children’
CONCLUSION

The research has been done. The studies exist. Get the facts and find out for yourself.

Concern for a safe and healthy environment is always of paramount importance. Going Green. Eco-friendly. Environmentally safe. These are common phrases heard over and over as we push for a clean, sustainable future.

The recent spate of media coverage concerning artificial/synthetic turf is more hype than fact. It is important to first get the truth from the science.

We are not aware of an injury or sickness diagnosed as a result of inhalation, ingestion, or of exposure to any of the components in the FieldTurf system.

Research and testing has been and continues to confirm that properly manufactured synthetic turf surfaces are a safe and sizeable contributor to an eco-friendly lifestyle.

Many countries have commissioned extensive studies to identify any potential dangers of crumb rubber (SBR). Throughout the years such research and testing has been carried out by world health associations, national health departments, municipal and federal groups, sporting associations, environmental protection groups, government ministries and official bodies.

These studies originated mostly in countries where environmental issues are of paramount importance. When the potential dangers were first presented, some countries even prohibited the use of SBR rubber in artificial grass fields. To our knowledge, the countries that originally restricted or prohibited the use of SBR have reversed their position since reviewing the data and results of the comprehensive studies they instituted.

THE RESEARCH HAS BEEN DONE. THE STUDIES EXIST. GET THE FACTS AND FIND OUT FOR YOURSELF.
Synthetic Turf Safety
Proven With Science