Synthetic Turf Safety Proven With Science

FieldTurf synthetic turf products lead the industry by setting higher performance and environmental standards. With well over 15,000 sports and landscape installations, FieldTurf is the world's most trusted brand of artificial turf and has steered a high growth industry in the proper direction by setting the strictest of environmental standards.

As the popularity of synthetic turf escalates, so has scrutiny about its usage. Over the past couple of years, natural grass pundits have raised questions about synthetic turf's potential negative impact on the environment.

Reports surrounding the environmental safety of artificial turf may, on the surface, be alarming. However, simply put, artificial turf is safe and the science is there to prove it. While FieldTurf acknowledges the concerns of the groups behind these initiatives, the truth is that their questions have already been answered. Volumes of research and testing from academics, federal and state governments like California, Massachusetts and Connecticut, and school systems have examined everything called into question about synthetic turf. In nearly every case, their conclusions suggest synthetic turf poses no health risks. One has to wonder that with all its fertilizers, pesticides, use of water and carbon emitting lawnmowers, would natural grass fare as well under similar scrutiny?

Synthetic turf is, and has always been safe. There is no legitimate scientific or medical evidence that synthetic turf poses a human health or environmental risk.

For a listing of the hundreds of studies carried out and a collection of the actual research and the factual conclusions, please download the documents at:
www.fieldturf.com/environmental-downloads

Let's review some of the key issues that were surrounding synthetic turf in the past.

LEAD

People panic when the word "lead" is mentioned, as it conjures up images of peeling paint that negatively affects a child's development. But lead chromate is very different. It was used to improve colorfastness in the pigments of many consumer products like synthetic turf. This inorganic substance is encapsulated to prevent it from being readily absorbed by the body or released into the environment. In over 40 years there has never been an instance of human illness or environmental damage caused by synthetic turf.

SO HOW DID THE MEDIA-HYPED LEAD HYSTERIA WITH ARTIFICIAL TURF START?

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. The synthetic turf fields at the Old Tappan and Demarest High Schools, which initially had been closed, were sampled on June 6, 2008. The testing found lead in the green turf fiber at concentrations of 4000 mg/kg (Old Tappan field) and 6300 mg/kg (Demarest field). However, when Dust Wipe sampling was conducted on the aforementioned Northern Valley (Old Tappan and Demarest) fields in New Jersey the values of the wipe test produced values between 10-35 µg/wipe which falls below the EPA guideline for dust on floors (40µg) and Interior Window Sills (250µg).

BOTH FIELDS WERE SUBSEQUENTLY RE-OPENED.

Over 90% of synthetic turf yarns have very low or undetectable levels of lead chromate. 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 absorbed by the body if ingested.

LEAD CHROMATE

"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."

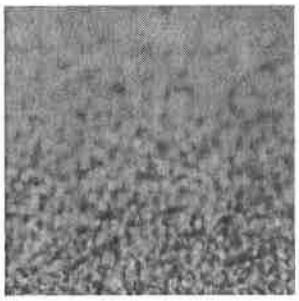
Center for Disease Control (CDC), June 2008, "Potential Exposure to Lead in Artificial Turf: Public Health Issues, Actions, and Recommendations"

"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'

'young children are not at risk from exposure to lead in these 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'

WHAT THE EXPERTS SAY

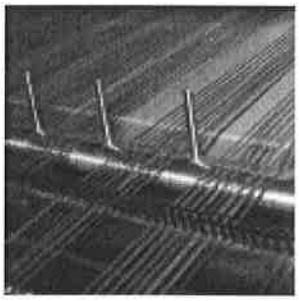
"The lead levels that were discovered are isolated to the core samples of the turf, and did not appear in the samples of dust, wipes and blades of artificial grass taken from the field - in other words, the lead is encapsulated in the fibers inside the turf and not leaching out to the surface to be ingested."

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'

CRUMB RUBBER

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, 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 discover the truth about any potential risks of artificial turf and its components. Government health ministries and environmental bodies around the world 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. But certain headlines reveal the tactics being used by some with a different agenda. They do not report the truth. The research has been done. The studies exist.

Read what the experts have to say in independent testing, studies and reports on the potential health and environmental impact of artificial turf.

'crumb rubber is also used in a variety of products from children's toys to surgical gloves to food packaging, even chewing gum'

INGESTION/ INHALATION

"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."

Connecticut Department of Public Health, October 2007, 'Artificial Turf Fields: Health Questions'

"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'

"In summary, an analysis of the air in the breathing zones of children above synthetic turf fields do not show appreciable impacts from COPCs [Contaminants of Potential Concern] contained in the crumb rubber. Therefore, a risk assessment was not warranted from the inhalation route of exposure."

New York City Department of Health and Mental Hygiene, March 2009, 'Air Quality Survey of Synthetic Turf Fields Containing Crumb Rubber Infill'

"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 blood stream."

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'

'sources of exposure unrelated to artificial turf fields are likely more important than the turf fields'

DERMAL CONTACT

"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'

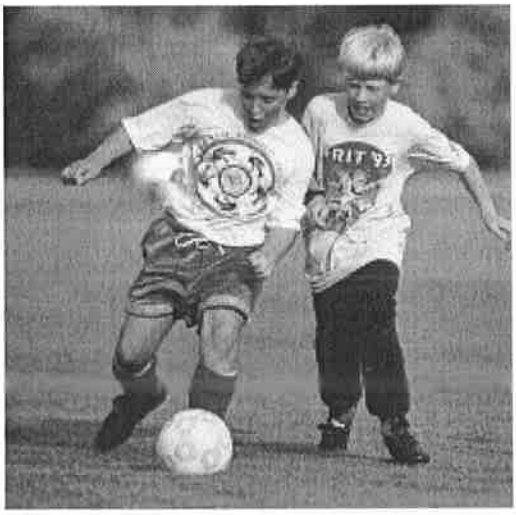
"Dermal exposure deemed low risk because carrier solvent is needed to extract toxic chemicals from tire crumb and to penetrate protective skin layers"

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'



AIR QUALITY

"Levels of chemicals in the air at synthetic turf fields do not raise a significant health concern. "

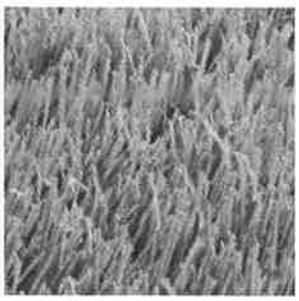
New York State Department of Environmental Conservation & New York State Department of Health, May 2009, 'An Assessment of Chemical Leaching, Releases to Air and Temperature at Crumb-Rubber Infilled Synthetic Fields'

"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."

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



'larger granules used in artificial turf will have even less potential for emissions.'

AIR QUALITY/ VOCS & PAHS

"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."

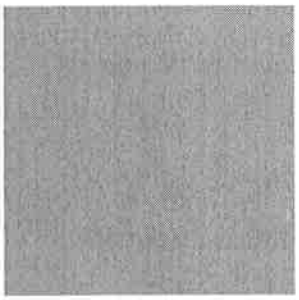
British Standards Institute (BSI), the Sports and Play Construction Association (SAPCA), March 2007, 'Twenty Questions [and Answers] on Rubber Granulate'

"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'

"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'



'indoor gymnasium situations are of no cause for concern for human health'

"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'

"This study provides evidence that 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', September 2009.

WATER QUALITY

"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. "

New York State Department of Environmental Conservation & New York State Department of Health, May 2009, 'An Assessment of Chemical Leaching, Releases to Air and Temperature at Crumb-Rubber Infilled Synthetic Fields'

"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."

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

"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'

'no basis for health or environmental concern due to leaching of hazardous materials'

"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'

MRSA/STAPH

One of the greatest causes of public outcry has been the increased occurrence of more virulent staph infections among school-age athletes. 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 hysteria is often brought on by companies or lobbyists with a vested interest in anti-microbial products.

HERE ARE JUST SOME OF THE STUDIES SUPPORTING THE SAFETY OF ARTIFICIAL TURF AS IT RELATES TO MRSA/STAPH:

'the speed with which we obtained the results is a testament to how clean things are there'

"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 Staphylcoccus 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."

California EPA Office of Environmental Health Hazard Assessment, July 2009, '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 Staphylcoccus Aureus (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 connection between current generation synthetic surfaces and MRSA infections'

"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."

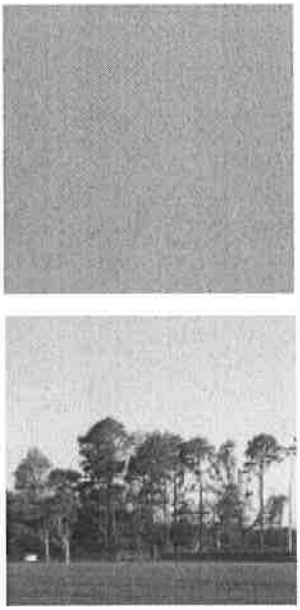
Ridgewood Environmental Advisory Committee (REAC) January-October 2009, 'Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ'

HEAT OVERVIEW

On a hot day, things outside get hot. There may be a few stretches in the summer where people should make adjustments for play on synthetic turf, but for the majority of the year it should not be an issue.

People should also take a practical approach to the situation. 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 some on practice times, considering pulling players off fields earlier and taking more breaks to cool down.

HERE ARE JUST SOME OF THE STUDIES SUPPORTING THE SAFETY OF ARTIFICIAL TURF AS IT RELATES TO HEAT:



'measured air temperatures ranged from 2° F lower to 2° F greater than the ambient air temperature'

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.

"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'

'there were double the amount of heat-related illnesses on natural grass playing surfaces compared with FieldTurf artificial turf fields'

IRRIGATION TO REDUCE HEAT

Ripken Experience Myrtle Beach, SC – Case Study

The Ripken Baseball Myrtle Beach Complex is the nation's premier tournament facility for baseball, complete with six FieldTurf fields to replicate some of the most famous ballparks in the history of the game.

The facility is outfitted with an irrigation system for days where the outside temperature becomes too hot and the fields need to be watered for a brief period of time. Myrtle Beach, being on the ocean in South Carolina, is a legitimate place to test the cooling effects of irrigation.

The complex has a health and safety group within Extra Bases, LLC (owner) that has mandated the temperatures where play must stop. At or about 125 degrees F (surface temperature), watering must begin.

Prior to the very first game played, the safety people and the management staff ran several tests to determine how to best water the fields. It was observed that 5 minutes (roughly 2 rotations of a typical sprinkler head) of irrigation dropped the temperature an average of 20 degrees.

Moreover, an additional 2 cycles dropped the temperature another 10 degrees. The temperatures did not breach the 125 degree F threshold for 2 to 2-1/2 hours. The ambient air temperature was in the 90's, and the sky was clear.

The tests were conducted during the most extreme of conditions around noon, when the UV was the greatest. The 125 degree F mandate is required by their insurance company, so it is not an arbitrary number.

The Ripken Baseball facility is proof of the effects of cooling because they have a lot of games played, and are situated in an area where the heating of the turf can be substantial.

'5 minutes (2 rotations of a typical sprinkler head) dropped the temperature an average of 20 degrees'

CONCLUDING REMARKS

Going Green. Eco-friendly. Environmentally safe. These are common phrases heard over and over in these turbulent times. Suddenly, the push for a clean, sustainable future is a major concern in the Western world. The recent spate of media coverage concerning artificial/synthetic turf is a prime example. Suddenly and without warning, one of the greatest advances in ecological technology is vilified, tried, and convicted—without the benefit of a fair hearing. It is important to realize that not a single injury or sickness has ever been reported anywhere in the world as a result of inhalation, ingestion, or of exposure to any of the components in the FieldTurf system.

With everything we do in our day-to-day lives, concern for a safe and healthy environment must always be of paramount importance. Certainly no one would ever imply anything different when the topic is an artificial grass playing surface. Research and testing has been and continues to be done, confirming that properly manufactured synthetic turf surfaces are a safe and sizeable contributor to an eco-friendly lifestyle.

It is important to consider all the facts surrounding the benefits of synthetic grass. As an example, recent major media publications have dealt with the nation's concern about obesity amongst our children today. At the same time, a growing population continues to put extreme pressures on the facilities within our school systems. So while educators extol the health virtues of exercise for youth, natural turf surfaces simply can't provide the 24/7 playability of synthetic turf.

'there is the ever-present issue of chemicals and pesticides applied to natural turf fields'

Another example is the potential to recycle the field at its end of life. New EPA-approved technologies allow worn-out artificial turf fields to be wholly consumed as fuel in certain plants, providing a truly "womb to tomb" environmentally sustainable solution.

Today, America's obsession with everything sports-related drives a multibillion dollar industry ever forward. Yet with record fuel prices wreaking havoc on personal, public and corporate budgets everywhere, it is tough to ignore the pockets of hypocrisy that appear in various segments of today's populace. On the one hand, there are knee-jerk reactions to such issues as crumb rubber infill and possible high levels of lead content in artificial turf.

On the other hand, there is the ever-present issue of chemicals and pesticides applied to natural turf fields—and the millions of gallons of precious water used annually to feed them. FieldTurf artificial turf fibers are produced 100 % lead-free. As the baby boom generation retires to warmer climates in the Southwest and Southeast, the strain on the finite water supply is already reaching extreme levels. We need to save the water resources for farms, not sport fields.

Hundreds of studies have been completed to discover the truth about any potential risks of artificial turf. Government health ministries and environmental bodies around the world 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. But recent headlines reveal the tactics being used by some with a different agenda. They do not report the truth.

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

Read what the experts have to say in independent testing, studies and reports on the potential health and environmental impact of artificial turf.

As the world leader in artificial grass, FieldTurf has led the way in advancing the environmental and safety benefits of artificial turf products. FieldTurf was designed not as a replacement for muddy fields but as an alternative to the best natural grass, to provide a playing surface where athletes of all ages could enjoy increased playing time on a consistently safe playing field through all weather conditions.

Countless studies, including a five-year study of high school football injuries and a three-year study of college football injuries, along with a multi-year study of soccer injuries, has shown that FieldTurf artificial grass significantly reduces the number and severity of injuries as compared to those recorded on natural grass.

Aside from the high volume of recycled materials used in our infill material, our artificial grass eliminates the wasteful and sometimes dangerous use of water, pesticides and chemicals, normally required to keep a natural grass field in good condition.

Countries all over the world have commissioned and executed hundreds of extensive studies to identify any potential dangers of crumb rubber (SBR). Over the past many 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 of every description.

These studies originated in countries where environmental issues have always been of paramount importance. When the potential dangers were first presented, some countries even outlawed the use of SBR rubber in artificial grass fields. Every country that originally restricted or outlawed the use of SBR has reversed its position since reviewing the data and results of the comprehensive studies they instituted, especially when it comes to protecting the health of our children. But such investigation requires a more thorough approach, involving science and long-term studies as opposed to catchy headlines and political agendas.

THE RESEARCH HAS BEEN DONE. THE STUDIES EXIST. GET THE FACTS AND FIND OUT FOR YOURSELF

'FieldTurf significantly reduces the number and severity of injuries compared to natural grass'

Information

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THE ULTIMATE
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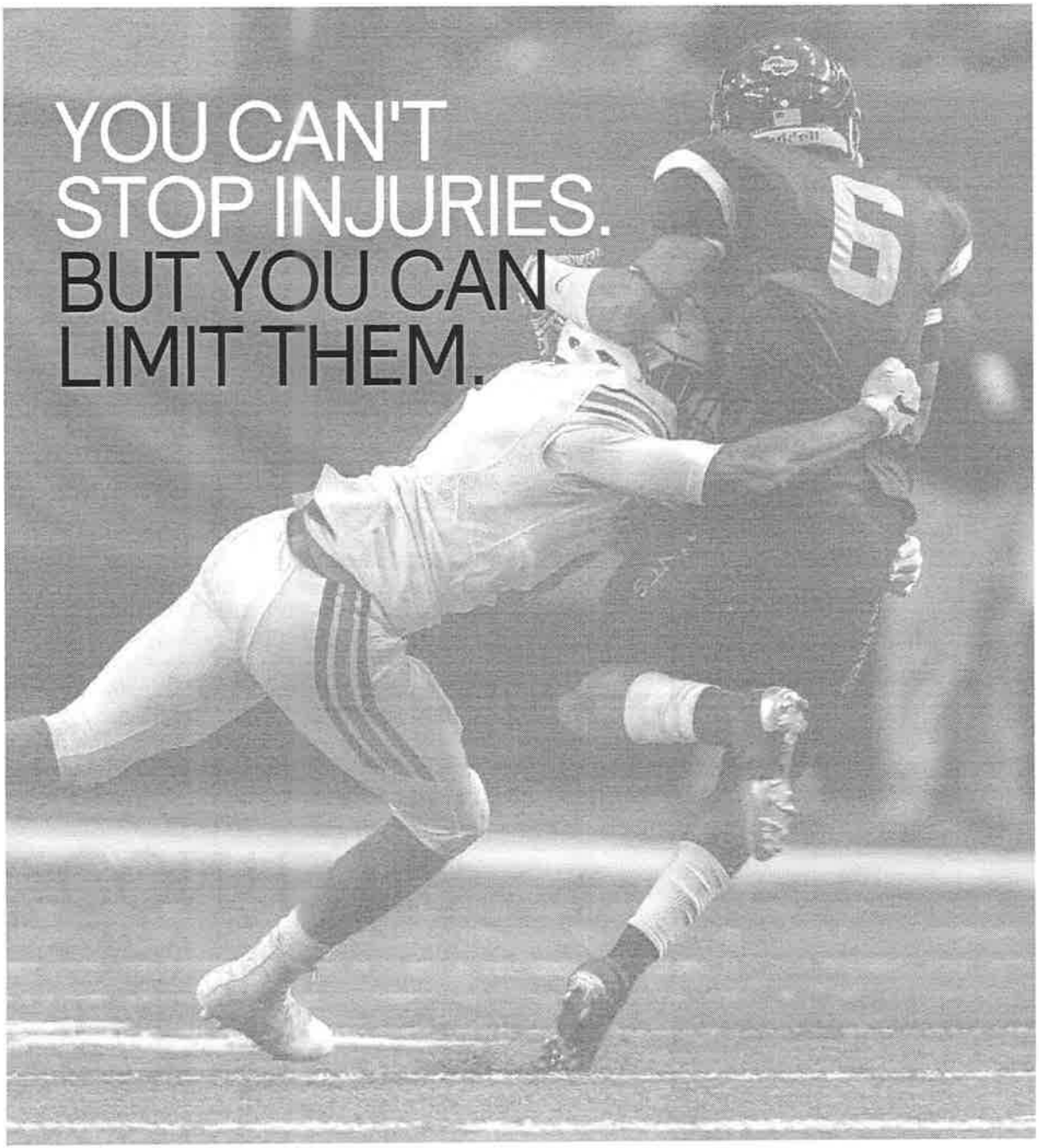
SAFETY RESEARCH



Keeping your athletes safe has and will always be our first priority. Every day, we push the boundaries of research and innovation to engineer the most advanced artificial turf system in the industry.

While no sport can ever be completely injury-free, we continue to find new ways to reduce the risk and severity of injuries. Our focus on safety has led to numerous injury-reducing innovations and improvements. As a result, we have the products and experience to help you provide the safest playing field possible for your athletes.

Independent multi-year research validates our efforts to provide you and your athletes with the safest field possible.

FieldTurf®
A Tarkett Sports Company

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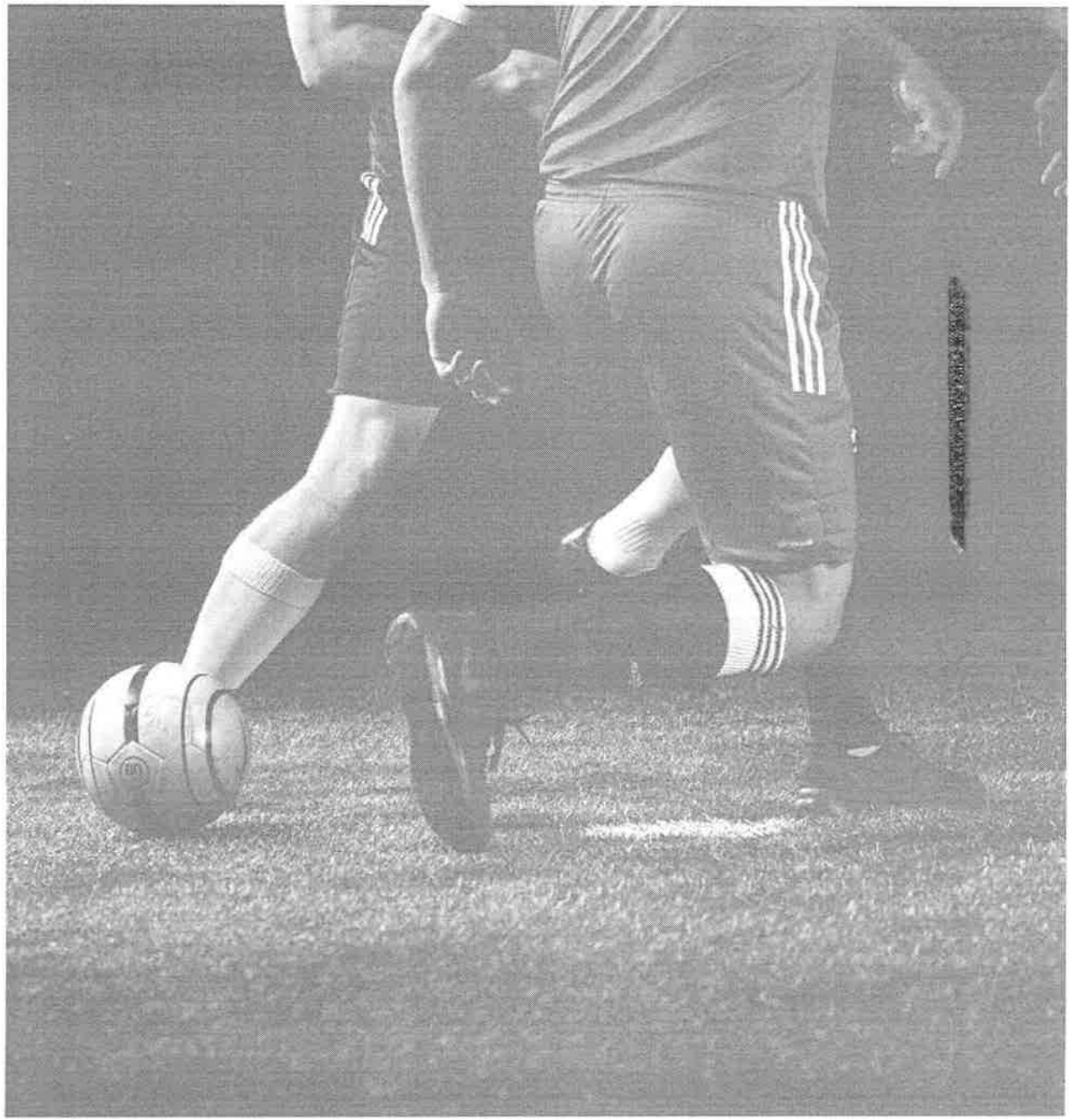


LEADING SAFETY PREVENTION RESEARCH

Michael C. Meyers
PhD, FACSM

Michael C. Meyers, PhD, FACSM, is presently Associate Professor in the Department of Sport Science and Physical Education at Idaho State University, Pocatello, ID. Formerly a Senior Research Scientist at Montana State University, he has been involved with injury research for over 30 years.

Dr. Meyers is a Fellow in the American College of Sports Medicine, Past-President of the Texas Regional Chapter of the American College of Sports Medicine, and also recognized on the Sport Psychology Registry, United States Olympic Committee.

Dr. Meyers holds a Ph.D. from Texas A&M University with an emphasis in exercise physiology as it relates to orthopedic sports medicine, a M.S. degree in equine nutrition and physiology (TAMU), and a B.S. degree in animal nutrition from Oklahoma State University. He is also an Adjunct Associate Professor and Graduate Faculty in the Department of Psychology at Texas A&M University, working in the area of pain response in athletes following injury and rehabilitation.

He has authored over 75 journal publications, over 460 national and international scientific/medical presentations, with research published in *American Journal of Sports Medicine, Medicine and Science in Sports and Exercise, Journal of Applied Physiology, European Journal of Applied Physiology, Clinical Journal of Sport Medicine, Journal of Sport Sciences, Physician and Sportsmedicine, Journal of Sport & Exercise Psychology, Journal of Equine Veterinary Science,* and *Sports Medicine.* Dr. Meyers has been featured in *Energy for Women Magazine, KTRH 740 AM News Radio-Houston, Outside Magazine, Fit Magazine, Newsweek-on-the-Air Radio Program,* and *PBS Scientific American Frontiers Television Series,* and is a recipient of the Sports Trauma and Overuse Prevention (STOP) Sports Injuries Award from the American Orthopaedic Society for Sports Medicine (AOSSM).

Over the past 30 years, Dr. Meyers has worked with numerous collegiate, professional, and elite sport organizations and athletes in the areas of comprehensive sport psychology and physiology performance assessment, nutritional analysis, strength and conditioning planning, and talent identification and development. Organizations include the U.S. Olympic Developmental Soccer Program, U.S. Equestrian Team, U.S. Gymnastics, Women's Professional Tennis Association, U.S. Water Skiing Team, National Intercollegiate Rodeo Association, and the Uruguay Olympic Committee serving as an Academic Specialist, Bureau of Educational and Cultural Affairs, U.S. Information Agency, Washington, DC.

Recipient of the Sports Trauma and Overuse Prevention (STOP) Sports Injuries Award from the American Orthopaedic Society for Sports Medicine (AOSSM).

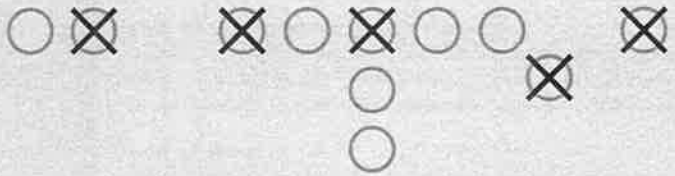
FIVE-YEAR STUDY OF SYSTEMS WITH VARIOUS INFILL WEIGHT FIELDTURF VS COMPETING SYSTEMS

Incidence, mechanisms, and severity of game-related high school football injuries across artificial turf systems of various infill weight

A 5-Year Prospective Study

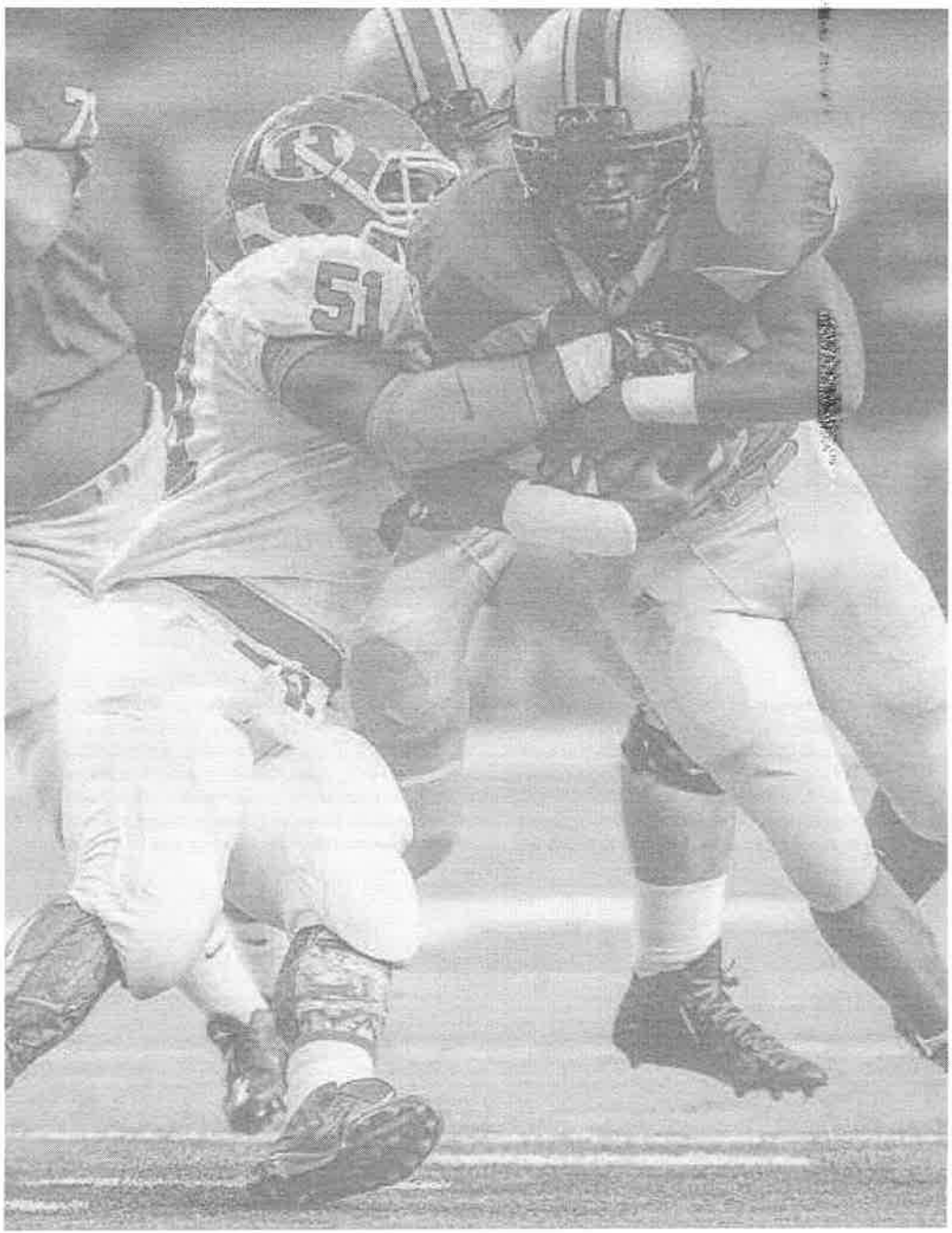
NOT PLAYING ON FIELDTURF?

YOU RISK LOSING 5 MORE PLAYERS
PER SEASON TO SUBSTANTIAL INJURIES



TOTAL INJURIES	CONCUSSION INJURIES COMBINED	PLAYER-TO-TURF COLLISION INJURIES	INJURIES ON TURF AGE 4 TO 8+ YEARS
20.5%	8.3%	36.9%	33.8%
LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF

RESULTS COMPARE ≥9 LB INFILL PER SQ.FT VS 3 - 5.9 LB INFILL PER SQ.FT



THREE-YEAR STUDY OF COMPETITIVE COLLEGE FOOTBALL FIELDTURF VS NATURAL GRASS

Incidence, Mechanisms, and Severity of Game-Related College Football Injuries on FieldTurf Versus Natural Grass

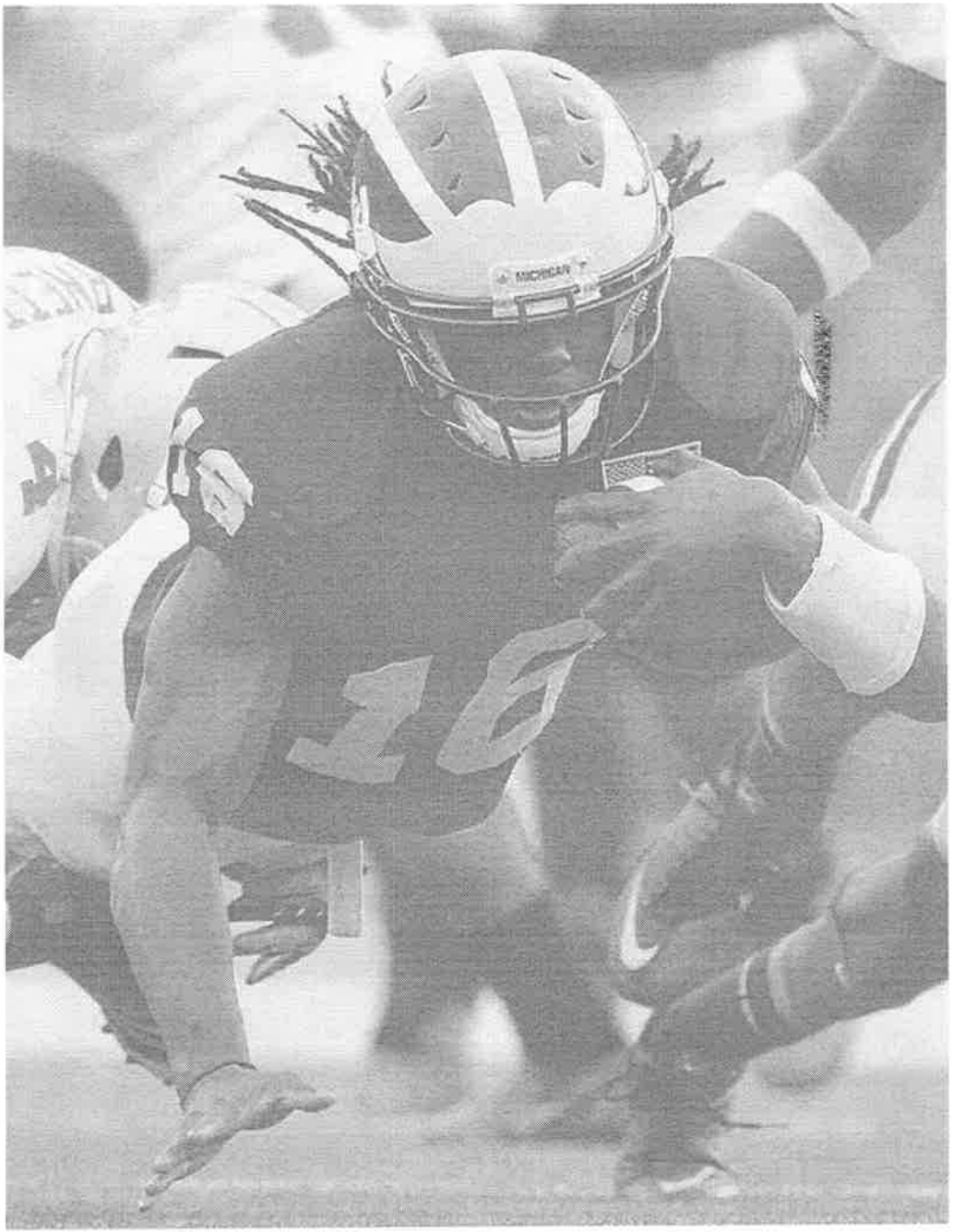
A 3-Year Prospective Study

31% Fewer Ligament Tear Injuries
2 out of 3 ligament tear injuries happen on natural grass.

21% Fewer Severe Injuries
For an 8-game season, that's one more player out with a severe injury on natural grass than on FieldTurf.

11% Fewer Concussion Injuries
For every 10 concussions, more than half happen on natural grass.

SUBSTANTIAL INJURIES	INJURIES IN RAIN-FIELD CONDITIONS	ACL INJURIES COMBINED	INJURIES ON TURF AGED 4 TO 8+ YEARS
16%	9%	13%	21%
LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF



FIVE-YEAR STUDY OF COMPETITIVE HIGH SCHOOL FOOTBALL FIELDTURF VS NATURAL GRASS

Incidence, Causes, and Severity of High School Football Injuries on FieldTurf Versus Natural Grass

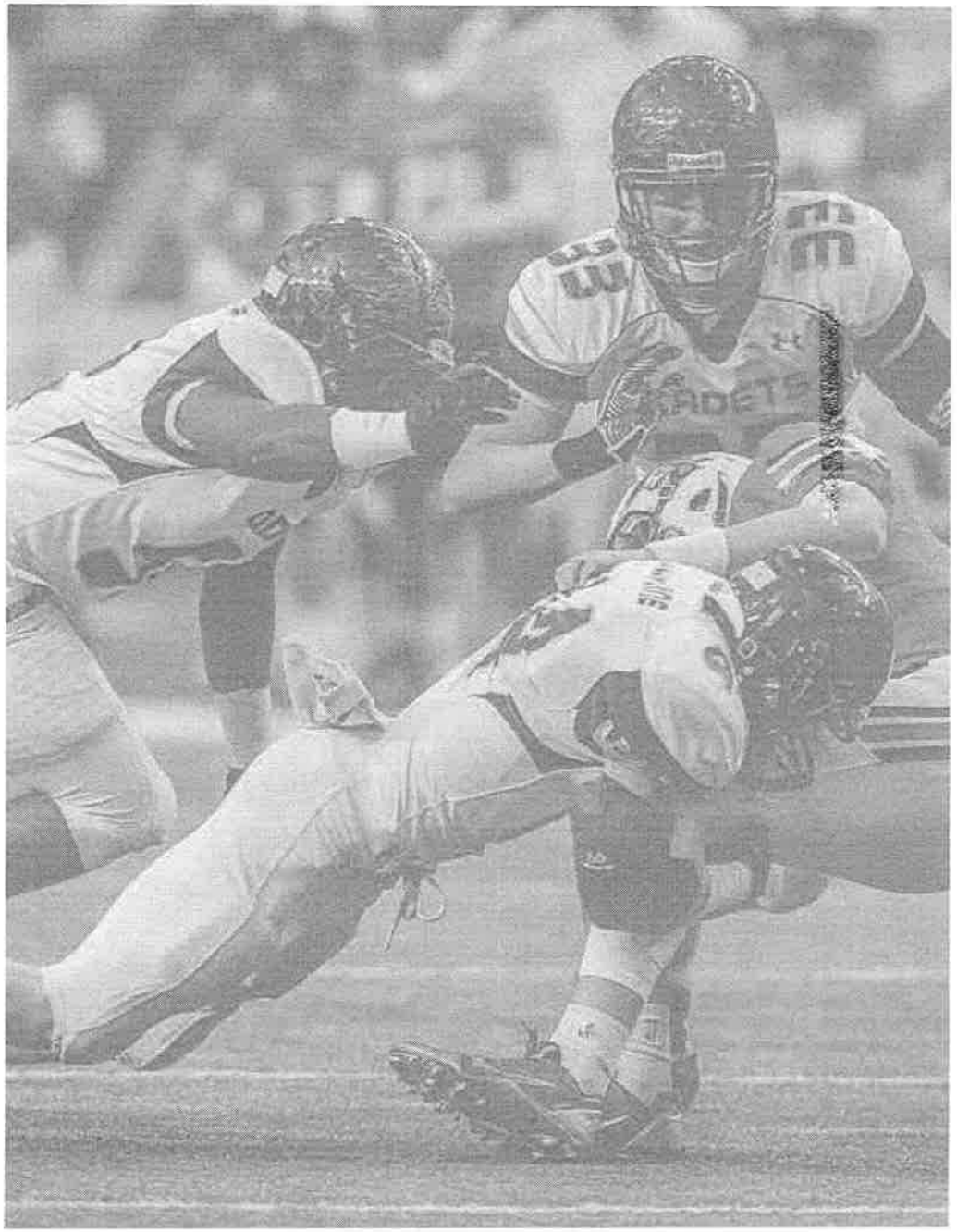
A 5-Year Prospective Study

43% Fewer ACL Injuries Combined
By playing on FieldTurf, you reduce your chances of incurring an ACL injury by almost half.

25% Less Time Lost to Long-Term Injuries (Lasting 22+ Days)
By playing on natural grass, you risk losing one extra player for over 22 days to injury.

44% Fewer Concussion Injuries
You almost double your risk of incurring a concussion injury by playing on natural grass.

SEVERE INJURIES	LIGAMENT TEARS	THIRD DEGREE GRADE INJURY	INJURY TIME LOSS 1-2 DAYS
27%	33%	20%	15%
LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF



SIX-YEAR STUDY OF COMPETITIVE MEN'S COLLEGIATE SOCCER FIELDTURF VS NATURAL GRASS

Incidence, Mechanisms, and Severity of Match-Related Collegiate Men's Soccer Injuries on FieldTurf and Natural Grass Surfaces

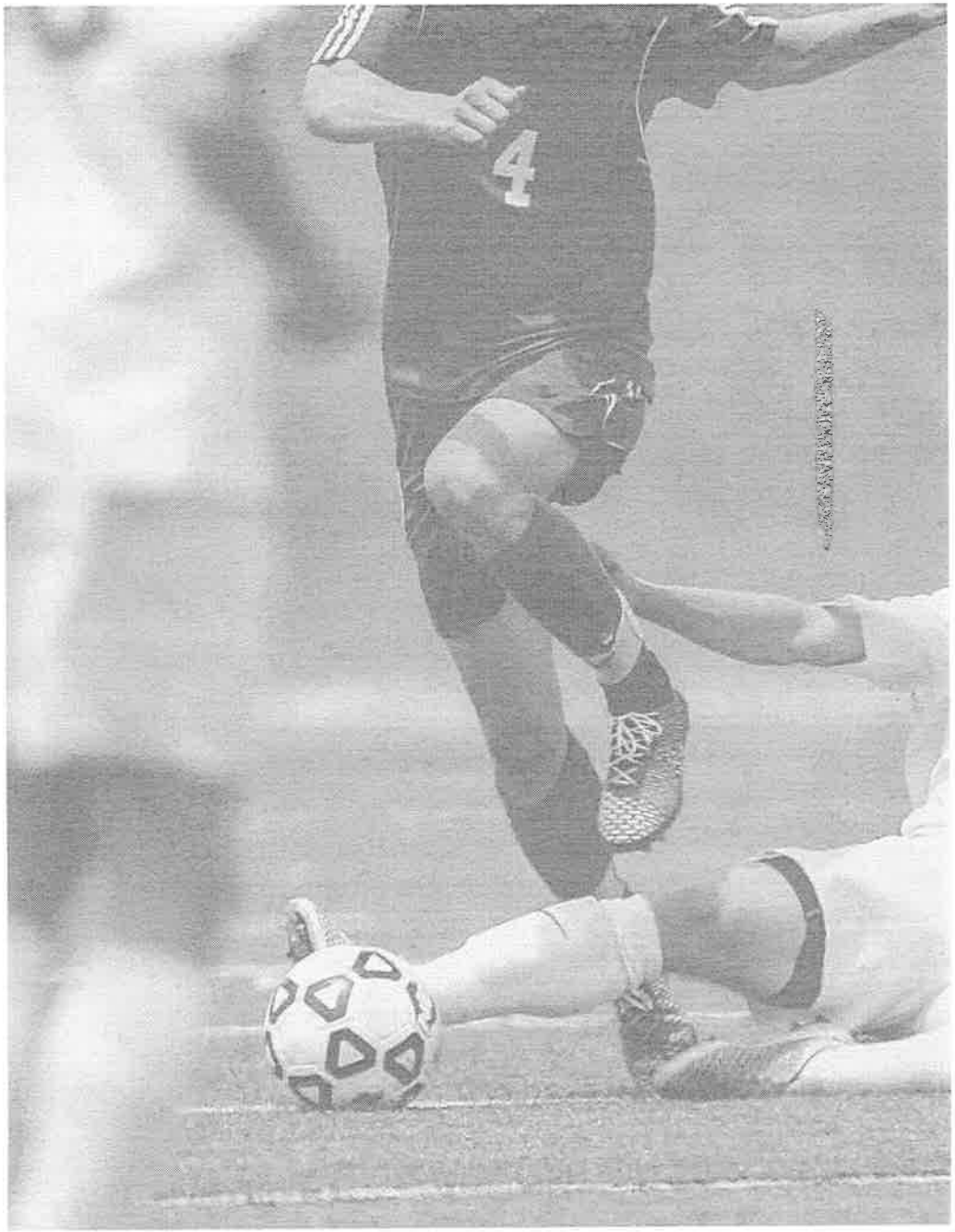
A 6-Year Prospective Study

25% Fewer Injuries
Every 10 games, you risk nearly 5 extra injuries playing on natural grass.

33% Fewer Concussion Injuries
2 out of 3 concussion injuries happen on natural grass.

57% Fewer Injuries on Surfaces Over 8 years old
You almost double your risk of incurring an injury playing on a natural grass surface that is over 8 years old than on a FieldTurf surface of the same age.

SUBSTANTIAL INJURIES	PLAYER-TO-TURF COLLISION INJURIES	MUSCLE TISSUE INJURY	INJURY TIME LOSS 10-22+ DAYS
47%	15%	29%	23%
LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF



FIVE-YEAR STUDY OF COMPETITIVE WOMEN'S COLLEGIATE SOCCER FIELDTURF VS NATURAL GRASS

Incidence, Mechanisms, and Severity of Match-Related Collegiate Women's Soccer Injuries on FieldTurf and Natural Grass Surfaces

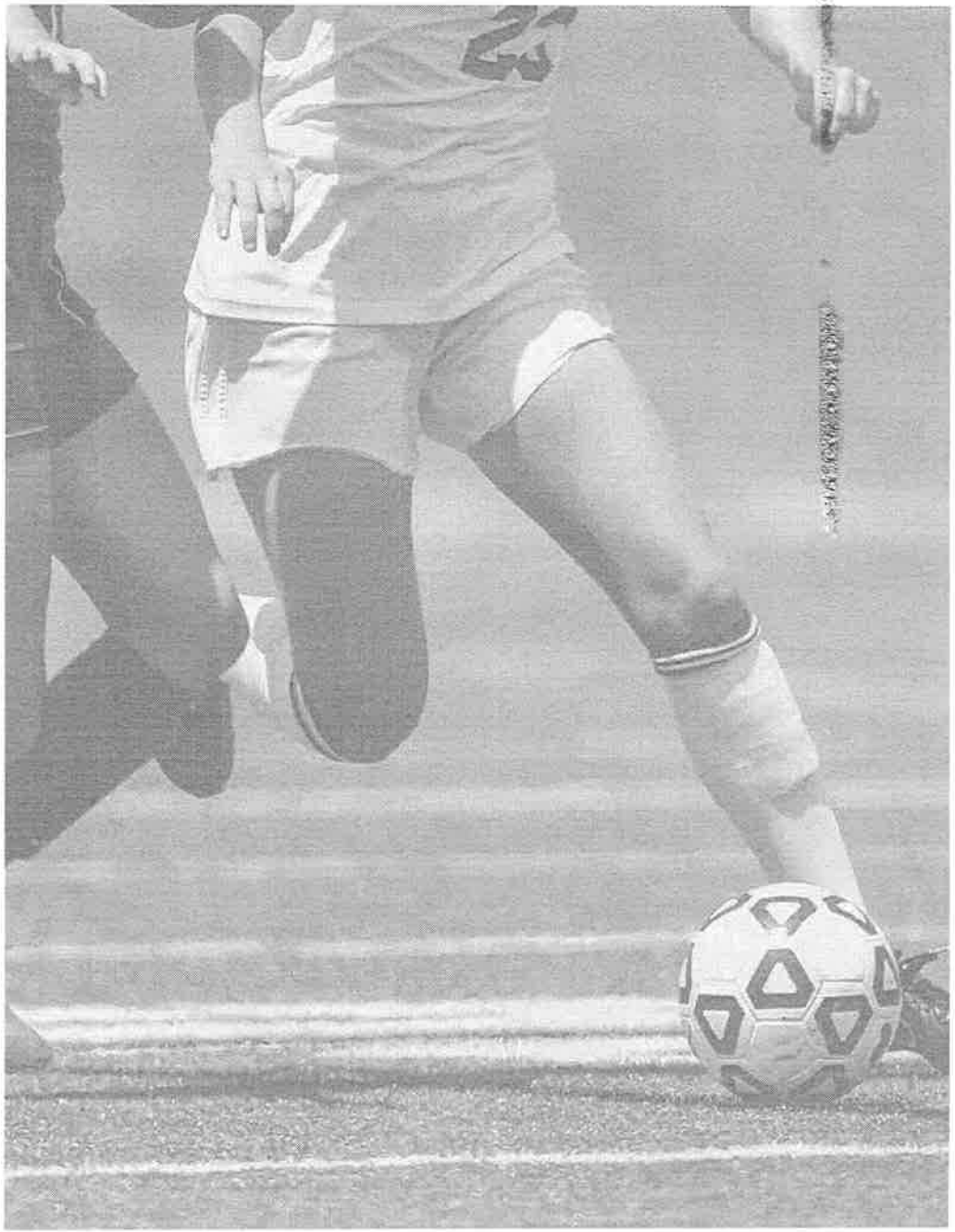
A 5-Year Prospective Study

11% Fewer Injuries
Every 10 games, you risk nearly 5 extra injuries playing on natural grass.

33% Fewer Severe Injuries
By playing on natural grass, you risk losing an extra player for over 22 days to injury.

57% Fewer Injuries on Surfaces Over 8 years old
You almost double your risk of incurring an injury playing on a natural grass surface that is over 8 years old than a FieldTurf surface of the same age.

SUBSTANTIAL INJURIES	INJURIES IN RAIN-FIELD CONDITIONS	INJURIES ON TURF AGED UNDER 1 YEAR	INJURY TIME LOSS 10-22+ DAYS
31%	17%	21%	15%
LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF	LOWER ON FIELDTURF



GUIDE TO FIELD SAFETY

In our minds, safety is always the primary objective. No exceptions. And no matter which supplier you work with, safety can never be compromised.

When building your field for your needs, you have all the power. To provide your field with stability, reduced infill migration, and reduced maintenance, simply design a specification with infill levels that are safe and with a composition of materials that are heavy.

MINIMUM INFILL WEIGHT / FIBER HEIGHT REQUIREMENTS

Based on the pile height of the system that you're looking to get, specifying the following infill weights will allow you to ensure that your field meets the minimum or optimal characteristics for a safe field.

	2" PILE HEIGHT		2.25" PILE HEIGHT		2.5" PILE HEIGHT	
	MINIMAL	OPTIMAL	MINIMAL	OPTIMAL	MINIMAL	OPTIMAL
RUBBER	3 LBS	2.6 LBS	3 LBS	2.2 LBS	3.5 LBS	3 LBS
SAND	2 LBS	3.65 LBS	3 LBS	6.2 LBS	4 LBS	6.2 LBS
TOTAL	**5 LBS**	**6.25 LBS**	**6 LBS**	**8.4 LBS**	**7.5 LBS**	**9.2 LBS**

How to ensure that every turf company bids a safe and stable surface for you?

1 DEMAND INFILL QUANTITY WEIGHT FROM EVERY TURF COMPANY.

This is the first step and probably the most important. You need to get companies to commit, in writing, to the infill weight they plan on installing. This should come in the form of a Product Specification Sheet. If the infill quantity isn't stated, ask the vendor to commit to a weight. This will remove any possibilities for your supplier to cut corners when building your field.

2 ESTABLISH YOUR INFILL WEIGHT MINIMUMS AND HAVE THEM WRITTEN IN THE SPECIFICATIONS.

We have our safety thresholds and our quality thresholds. And that means we won't offer a product that contains less than 6 pounds of infill per square foot* for any of our turf systems used for contact sports. That just won't happen with us.

* Systems less than 6 lbs require a separate shock pad for contact sports.

3 LISTING INFILL RATIOS IS NOT SUFFICIENT - THE WEIGHT MUST BE SPECIFIED!

Very few companies list infill values on their specifications, and those that do will often list a ratio, percentage or volume - not a weight. Most will mask infill weight with a "70/30" ratio of rubber to sand, without specifying the total weight of the system. So you could be getting 2 pounds of rubber and 0.8 pounds of sand.

Others will list a depth, without mentioning the material breakdown per weight. Withholding sand and placing 3.5 pounds of rubber may get competitors close to 1.5" depth at installation, but migration will affect the stability of the field in the very near term.

4 FOCUS ON SAFETY, NOT MARKETING.

Adding more turf fibers per square foot costs fractions of a penny, so it might be very tempting for some companies to promote fiber at the expense of infill.The amount of fiber plays no part in how safe your field is. Nor will it have any effect on how your field looks.

To date, there's not one shred of scientific data showing that adding more fiber will make your playing surface safer. There is, however, plenty of scientific data that shows that adding more infill will indeed make your playing field safer.

Yes, it will cost a bit more to add infill and make your field much safer. By putting the athlete's safety first, we've established our own minimum standard, and we encourage you to do the same. Specifying minimum infill weight is your answer!

CONTACT US:
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LABOSPORT

TECHNICAL REPORT

Simulated Mechanical Abrasion during Use (Lisport Wear Machine) – 40,000 cycles and Abrasion test. Comparison of Classic HD, XP Pro and XPS

Report Number **12381 CAN/12349 CAN/12411 CAN**

Client **Fieldturf**

Date **June 14th, 2012**

This report contains 25 pages in total.

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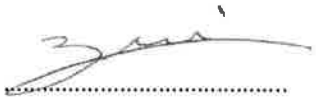
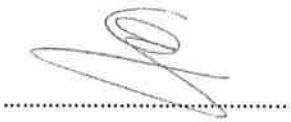
SUMMARY

A synthetic turf system has been tested for the artificial wear test (LISPORT).This report describes the tests carried out and the results obtained.

REPORTED BY:



Mickaël Benetti, T.P. (Lab Manager)



Guillaume Loubersac (Director)

TEST PROGRAM

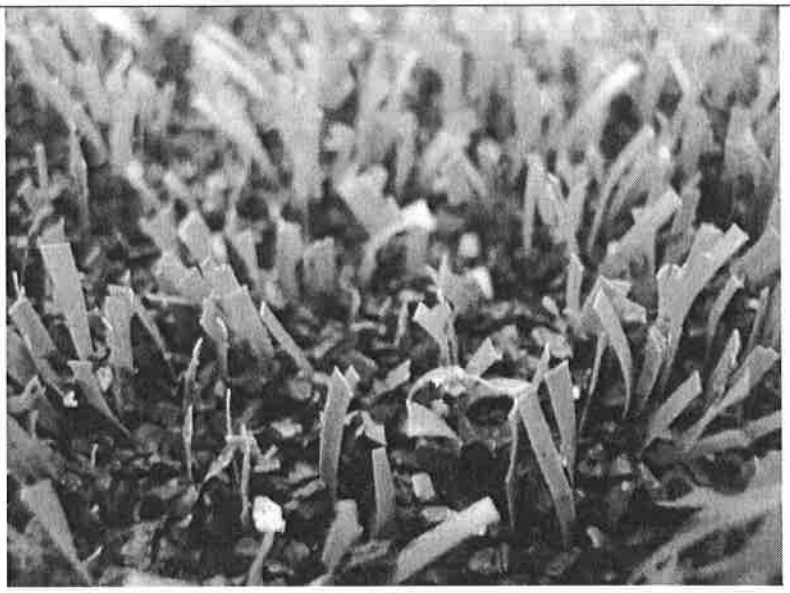
The artificial wear test (LISPORT) was undertaken in accordance with EN 15306 *Surfaces for outdoor sports areas – Exposure of synthetic turf to simulated wear.*

A total of 40,000 cycles of artificial wear was defined and an observation of the sample has been done every 5,000 cycles.

Simulated Mechanical Abrasion during Use (Lisport Wear Machine) – 40,000 cycles and Abrasion test.

LABOSPORT

SAMPLE DETAILS - CLASSIC HD

Description of the system tested	TURF CARPET FILLED WITH SAND AND CRYOGENIC RUBBER RECIPE: - UPPER LAYER: RUBBER (CRYOGENIC): 9.95 KG/M^2 - MIDDLE LAYER:MIX 1.87 SAND + 1 RUBBER (CRYOGENIC): 26 KG/M^2 - LOWER LAYER: SAND: 4.8 KG/M^2
Product Name	FIELDTURF FTHD-1 CLASSIC HD
Sample Number	CAN000700
Picture	

PROCEDURE

The artificial wear test (LISPORT) simulates the interaction between a sports shoe and sport surface, to allow changes in appearance and to allow sports functional characteristics to be measured. Pictures of flattening of fibers, of pile fibrillation and fraying or breakage of fibers have been taken.

Sand and cryogenic rubber were provided by Labosport Inc.

Determination of None, Slight, Moderate, Severe:

Test	None	Slight	Moderate	Severe
Flattening of fibers	Initial free pile height.	2/3 to 3/3 of initial free pile height.	1/3 to 2/3 of initial free pile height.	0/3 to 1/3 of initial free pile height.
Infill Dispersion	0% of the infill weight of the sample.	0% - 33% of the infill weight of the sample.	33% - 66% of the infill weight of the sample.	66% - 100% of the infill weight of the sample.

Fraying or breakage of fibers and tuft loss observations are determined by visual inspection.

RESULTS – OBSERVATIONS – FLATTENING OF FIBERS

Exposure	Classic HD	XP Pro	XPS
0 cycles	None	None	None
5,000 cycles	Slight	Slight	Slight
10,000 cycles	Slight	Slight	Slight
15,000 cycles	Slight	Slight	Slight
20,000 cycles	Slight	Slight	Slight
25,000 cycles	Slight	Slight	Slight
30,000 cycles	Slight	Slight	Slight
35,000 cycles	Slight	Slight	Slight
40,000 cycles	Slight	Slight	Slight

Simulated Mechanical Abrasion during Use (Lisport Wear Machine) – 40,000 cycles and Abrasion test.

LABOSPORT

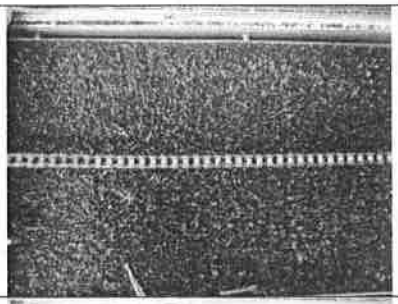
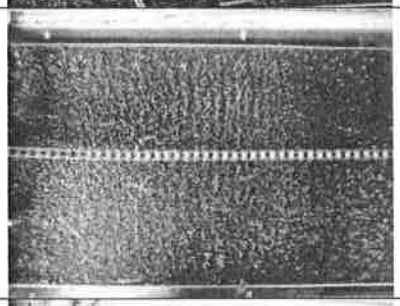
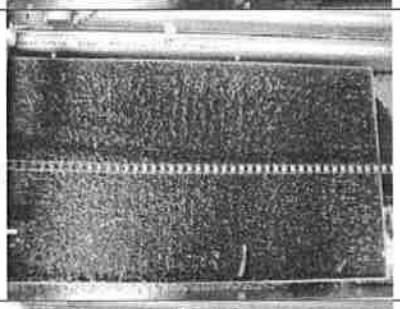
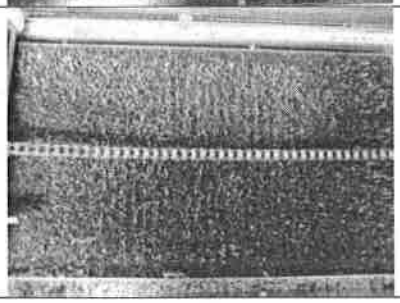
RESULTS – OBSERVATIONS – FRAYING OR BREAKAGE OF FIBERS

Exposure	Classic HD	XP Pro	XPS
0 cycles	None	None	None
5,000 cycles	None	None	None
10,000 cycles	None	Slight	None
15,000 cycles	None	Slight	Slight
20,000 cycles	None	Slight	Slight
25,000 cycles	Slight	Slight	Slight
30,000 cycles	Slight	Slight	Slight
35,000 cycles	Slight	Slight	Slight
40,000 cycles	Slight	Slight	Slight

Simulated Mechanical Abrasion during Use (Lisport Wear Machine) – 40,000 cycles and Abrasion test.

LABOSPORT

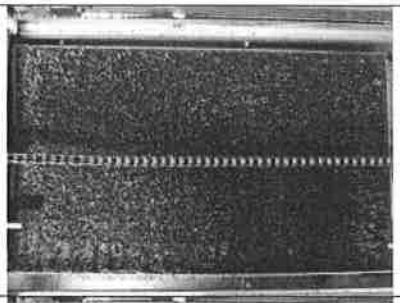
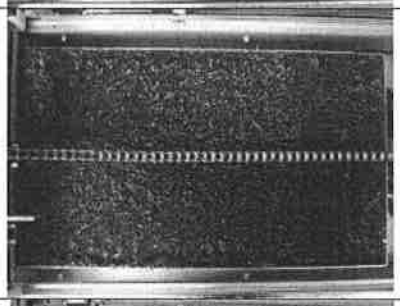
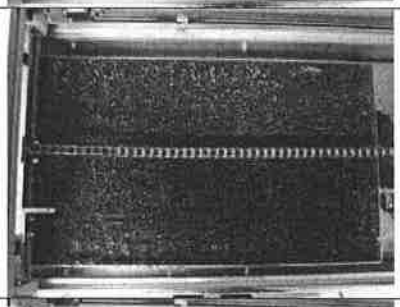
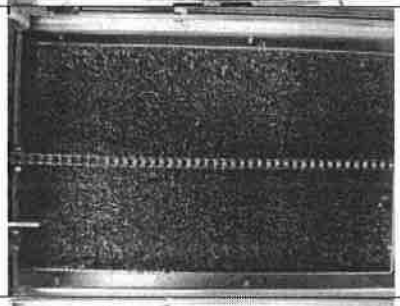
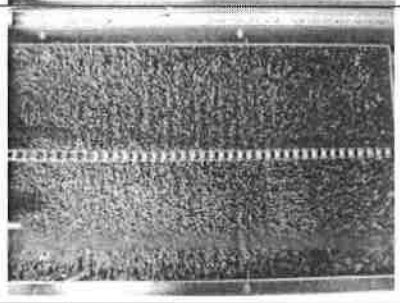
RESULTS – PICTURES - CLASSIC HD

Exposure	Sample view	Flattening of fibers	Pile Fibrillation
0 cycles			
5,000 cycles			
10,000 cycles			
15,000 cycles			

Simulated Mechanical Abrasion during Use (Lisport Wear Machine) – 40,000 cycles and Abrasion test.

LABOSPORT

RESULTS – PICTURES - CLASSIC HD

20,000 cycles			
25,000 cycles			
30,000 cycles			
35,000 cycles			
40,000 cycles			

CONCLUSION

CLASSIC HD:

After 40,000 cycles, the physical integrity of the fibres is not damaged. The backing is playing its role and retains the fibers.

CONCLUSION – XP PRO:

After 40,000 cycles, the backing is playing its role and retains the fibers. We notice some fibers breaks during the test.

CONCLUSION - XPS:

After 40,000 cycles, the backing is playing its role and retains the fibers.

FieldTurf
A Tarkett Sports Company

THE ULTIMATE
SURFACE EXPERIENCE

QUALITY CONTROL - FIBER & MANUFACTURING

To ensure quality at the highest level, we have invested heavily in modernizing our plants with the latest fiber manufacturing, coating and tufting technologies along with top manufacturing talent. This allows us to make your field the best field.

We are ISO 9001, ISO 14001 and OHSAS 18001 certified for leadership in quality, environment and safety management systems. Our Calhoun facility represents one of the only artificial turf manufacturing operation in North America to have received these ISO certifications.

While our market share is greater than all of our competitors combined, we know that means nothing if your project isn't on target and on time. That's why we've worked hard to maintain the best record for on-time completion in the industry.

MANUFACTURING EXCELLENCE

During the manufacturing process there are three aspects to turf construction – Fiber Production, Tufting, and Coating. What's important to know is that we control all three aspects of the value chain. Nothing is left to a third party. Nothing is left to chance. This provides you with a level of quality assurance that simply cannot be matched.

Fiber Production:

Our fibers are produced at our very own facility in Germany. This state-of-the art facility was opened in 2010 and as a result has turned FieldTurf into one of the most vertically integrated companies in the world.

Tufting and Coating:

Once the fiber is produced it is ready for tufting and coating which takes place at our 500,000 square-foot facility in Calhoun, Georgia. The Calhoun facility employs over 40 employees, with a combined 300+ years of experience in the artificial turf industry.

In-house laboratory testing performed on each field during each stage of preparation (Beginning to final inspection) Retains are taken from each field.

Raw materials (backing, fiber etc...) are verified and inspected prior to tufting/coating of field.

The quality control team is full-time certified in house inspectors (Germany and Calhoun). The process at the facility includes stringent internal testing of the yarn properties (tensile strength, uniformity, pick counts (Yarn density in relation to backing), color verification, elongation,

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THE ULTIMATE
SURFACE EXPERIENCE

tenacity, denier, shrinkage and twist). The product proposed meets or exceeds the product specifications. FieldTurf product certifies the "C6" LLDPE which contains 6 carbon atoms and 12 Hydrogen atoms with UV stabilizers.

FieldTurf has successfully undergone Lisport wear tests as part of Penn State University's fiber wear testing program.

Please visit our website for more detailed information.

www.fieldturf.com

Regards,

Darren Gill
Vice-President – Marketing, Innovation, Customer Service

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TESTING SERVICES, INC.
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DALTON, GEORGIA 30722-2041
PHONE: (706) 226-1400 • FAX: (706) 226-6118

Prepared for:

FieldTurf
A Tarkett Sports Company

THE ULTIMATE SURFACE EXPERIENCE

REPORT NUMBER:	**56534**
LAB TEST NUMBER:	2490-4734
DATE:	October 31, 2012

Test Material:

Turf Identification
XT-57

Test Scope: A synthetic turf sample was submitted for a battery of testing to analyze construction and physical properties.

	Test Method	Test Description	Test Result	
PRODUCT TESTING	ASTM D5848-10	Total Product Weight	61.07 oz/yd²	
	ASTM D5848-10	Pile Yarn Fiber Weight	33.53 oz/yd²	
	ASTM D5848-10	Primary Backing Weight	7.90 oz/yd²	
	ASTM D5848-10	Secondary Backing Weight	19.64 oz/yd²	
	ASTM D5823-05a	Average Pile Height	2.25"	
	ASTM D1335-11	Average Tuft Bind Strength	11.8 lbs/force	
	ASTM D5034-09	Average Grab Tear Strength	MD: 293.9 lbs/force	CMD: 273.0 lbs/force
	ASTM D5793-05	Binding Sites	Stitch Per Inch: 3.66	Gauge: 3/4"

	Test Method	Test Description	Test Result
*PERFORMANCE TESTING	ASTM F355-10a	Gmax	88
	ASTM D2859-06(2011)	Pill Flammability	Passes
	ASTM F1551-09; DIN 18-035	Water Permeability	122.3 inches/hour

*All Performance Testing was conducted with the specified infill per client's request.

Individual Testing Reports are available upon request, which provide the detailed test results and specific procedures.

Approved By:

Erle Miles, Jr VP
Testing Services Inc

OUR LETTERS AND REPORTS APPLY ONLY TO THE SAMPLE TESTED AND ARE NOT NECESSARILY INDICATIVE OF THE QUALITIES OF APPARENTLY IDENTICAL OR SIMILAR PRODUCTS. THESE LETTERS AND REPORTS ARE FOR THE USE ONLY OF THE CLIENT TO WHOM THEY ARE ADDRESSED AND THEIR COMMUNICATION TO ANY OTHERS OR THE USE OF THE NAME TESTING SERVICES, Inc. MUST RECEIVE OUR PRIOR WRITTEN APPROVAL. THE REPORTS AND LETTERS, AND OUR NAME, OUR SEALS, OR OUR INSIGNIA ARE NOT UNDER ANY CIRCUMSTANCES TO BE USED IN ADVERTISING TO THE GENERAL PUBLIC.
VISIT OUR WEBSITE AT www.tsiofdalton.com

1. Substance/preparation and company identification

Grass Yarn consisting of LLDPE
Use: Grass Yarn for artificial turf

Company:
Morton Extrusionstechnik GmbH
Im Pfarrgrund 5
69518 Abtsteinach
GERMANY
Telephone: +49 6207-92395-0
Fax: +49 6207 92495-39
e-mail: info@morton-extrusionstechnik.de

2. Composition/information on ingredients

Chemical characterization of polymer:
LLD Ethylene/1-Hexene Copolymer, CAS-No: 25213-02-9

Physical characterization:
Grass Yarn with different yarn-count, different colours, wound-up on capable spools

3. Hazard identification

According to Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures:
Label elements and precautionary statement:
The product does not require a hazard warning label in accordance with GHS criteria.

Classification of the substance and mixture:
No need for classification according to GHS criteria for this product.

Possible Hazards (according to Directive 67/548/EWG or 1999/45/EC):
No particular hazards known.

4. First-aid measures

Inhalation
No specific treatment is necessary since this material is not likely to be hazardous by inhalation.
If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.

Skin contact
Product, at ambient conditions, is not expected to be hazardous by skin contact. Should irritation occur, rinse with water.
In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove solidified polymer from skin.

Eye contact
Flush eyes with water as a precaution. If irritation persists get medical attention.
In case of contact with molten product, cool rapidly with water and seek immediate medical attention.

Ingestion
If swallowed, do NOT induce vomiting. Consult a physician if necessary.

Notes to physician
Contact with molten polymer can cause significant tissue damage. Provide general supportive measures and treat symptomatically.

5. Fire-fighting measures

General fire hazards
Polymer can burn if exposed to a fire. Acetaldehyde vapors form explosive mixtures in air and can spontaneously ignite at temperatures above 347F (175C).

Industrial handling of polymer pellets or chips has the potential to generate dust. Polymer dust can accumulate over time on buildings and equipment. After a significant amount of dust accumulation and disturbance, dust may form explosive mixture in air. Ensure that good housekeeping practices are followed.

Hazardous combustion products
Irritating and toxic gases or fumes may be released during a fire.
Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.
Molten polymer or prolonged air drying of polymer at temperatures above 195 °C will release small quantities of acetaldehyde (CAS# 75-07-0).

Suitable extinguishing media
Dry chemical, CO2, water spray or regular foam.

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Protection of fire-fighters
Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Specific methods
In the event of fire and/or explosion do not breathe fumes.

6. Accidental release measures

Personal precautions
Surfaces may become slippery after spillage.

Methods for cleaning up
Clean up in accordance with all applicable regulations.

Other information
Sweep up or gather material and place in appropriate container.

7. Handling and storage

Handling
Use care in handling/storage.
Molten material can cause burns. Handle molten material with care.

Storage
Keep away from heat, sparks, and flame.

Further information
Use good housekeeping methods to keep accumulation of dust to a minimum

8. Expose controls and personal protection

Addition Exposure Data
No exposure limit value known

Engineering measures
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Personal protective equipment

Respiratory protection
When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate respiratory protection must be provided.

Hand protection
Not normally needed under ambient conditions.
For molten material use heat resistant gloves.

Eye protection
Wear safety glasses with side shields.
If handling molten material, additional protection may be needed, which may include face shield.

Skin and body protection
It is a good industrial hygiene practice to minimise skin contact.
When material is heated, wear gloves to protect against thermal burns.

Hygiene measures
Use good industrial hygiene practices in handling this material. Wash hands before breaks and at the end of workday.

9. Physical and chemical properties

Colour	Based on specification.
Form	Solid.
Odour	Slight to none.
Auto-ignition temperature	> 300°C
Boling point	not determined
Decomposition temperature	> 300 °C
Flashpoint	closes cup: > 300 °C
Melting point	115 to 132 °C
Octanol / H2O Coeff	not determined
Odour threshold	not determined
pH	not determined
Solubility (H2O)	insoluble

10. Stability and reactivity

Stability
This is a stable material.

Conditions to avoid
Heat, flames and sparks.

Hazardous polymerisation
Not expected to occur.

11. Toxicological Information

Toxicological information
Due to this material's high molecular weight, this material is considered to be of little to no toxicological concern.

Acute toxicity
LD50/oral/rat: >5.000 mg/kg

Mutagenicity
No known significant effects or critical hazards.

Teratogenicity
No known significant effects or critical hazards.

Developmental effects
No known significant effects or critical hazards.

12. Ecological Information

Ecotoxicity
This material is not expected to be harmful to aquatic life.

Persistence and degradability
Based on the physical properties of this product, significant environmental persistence and bioaccumulation would not be expected.

13. Disposal consideration

Disposal Instructions
Dispose in accordance with all applicable regulations.

14. Transport Information

ADR Not regulated as dangerous goods.

IMDG Not regulated as dangerous goods.

IATA Not regulated as dangerous goods.

15. Regulatory Information

Regulations of the European union (Labelling) / National legislation/Regulations

Directive 1999/45/EC ('Preparation Directive')
The product does not require a hazard warning label in accordance with EC-Directives

16. Other information

This MSDS is related to Regulation (EC) No. 1907/2006, even though the product is not hazardous and there is no duty to issue a MSDS.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements.
The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet.
It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.