

Appendix IV. Synthetic Turf Fact Sheet

Fact Sheet on Synthetic Turf Used in Athletic Fields

Synthetic turf fields using crumb rubber have been installed and used in many athletic and playing fields throughout Fairfax County, the United States and the world. Currently Fairfax County Public Schools and Parks have 48 rectangular athletic fields composed of synthetic turf material. Questions have been raised about potential health, safety, and environmental effects from the use of synthetic turf. This fact sheet was prepared in consultation with the Fairfax County Health Department, Fairfax County Risk Management Division, Fairfax County Public Schools and Fairfax County Park Authority to provide information on research conducted by numerous state and national organizations who have studied these issues.

Q: Why is synthetic turf used in Fairfax County?

A: Starting in the early 2000's the Park Authority along with other organizations in the County that provide athletic facilities began looking at alternatives to natural turf fields to meet the growing demand for use of athletic fields throughout the County.

Synthetic turf is a man-made product and is mostly installed in fields that are heavily used. Synthetic turf fields are used in Fairfax County because they:

- Provide even playing surfaces
- Provide similar playing conditions to natural turf fields
- Need no watering or mowing
- Use no fertilizers or pesticides
- Can be used year-round and in most weather
- Do not need to be closed to protect or re-sod grass
- Have a significant life cycle with reduced maintenance

Q: What are synthetic turf fields made of?

A: Synthetic turf fields installed in Fairfax County have been constructed using a synthetic carpet material that mimics natural grass along with a crumb rubber infill or sand/crumb rubber infill mixture and subsurface drainage systems. Synthetic turf fields are made of the following materials:

- A subsurface drainage layer composed of crushed stones with plastic tubing for drainage.
- A top layer composed of plastic mesh with soft, plastic strands that resemble blades of grass.

- Crumb rubber infill, made from recycled tires, is added to the top layer to provide padding and keep the grass upright. Sand is sometimes mixed with the crumb rubber.

Q: What chemicals can be found in the synthetic turf crumb rubber?

A: The crumb rubber used in synthetic turf is mainly composed of recycled tires, which contain man-made and natural rubber. Based on the review of research studies and reports, certain chemicals have been identified in crumb rubber. These include small amounts of polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and heavy metals such as zinc, iron, manganese and lead.

Q: Can people be exposed to the chemicals found in crumb rubber?

A: To date, studies on the release of chemicals from crumb rubber have reported very low concentration of chemical exposure. Although the potential for health effects due to exposure to chemicals in crumb rubber is very low, there are three possible ways for people to have contact with these chemicals on artificial turf fields:

- Accidentally ingesting small amounts of crumb rubber by putting fingers in the mouth or not washing hands before eating after playing on the fields
- Breathing in dust and vapors while playing on the fields. Crumb rubber may become dust as it wears and the rubber may give off some vapors.
- Direct skin contact with the crumb rubber.

Q: Are any health effects associated with these chemicals found in synthetic turf crumb rubber?

A: The health and safety aspects of synthetic turf have been reviewed and addressed by many national and state organizations, including the U.S. Environmental Protection Agency, the Centers for Disease Control and Prevention, and numerous state agencies in California, Connecticut, New Jersey, and New York. They generally conclude that health effects are unlikely from exposure to the levels of chemicals found in synthetic turf and that these fields do not pose a serious public health concern. Specifically, a review of the available information on crumb rubber by the New York Department of Health indicates that ingestion, dermal, or inhalation exposures to chemicals in or released from crumb rubber do not pose a significant public health concern. A multi-agency report from the State of Connecticut concluded that the use of outdoor and indoor artificial turf fields is not associated with elevated health risk. Studies and reviews conducted by the California Office of Environmental Health Hazard Assessment found that synthetic turf fields do not represent a serious human health risk with regard to the inhalation of chemicals or particulates above these fields. These studies indicate that at much higher levels, these chemicals can cause serious health effects. Some PAHs may

pose a cancer risk for people exposed to high levels for long periods. VOCs can cause eye, nose, throat, and skin irritation. In young children, exposure to lead may cause learning and behavioral problems and lowered intelligence.

Q: Can people be exposed to these chemicals from other sources?

A: The PAHs and VOCs found in crumb rubber are very common in the urban environment. People can be exposed by breathing or eating or by getting dirt or dust on their skin. Rubber dust from car tires is a source of urban air pollution and soil pollution. PAHs are present in exhaust, smoke, soot, urban soil and char-broiled foods. VOCs are released into the air from gasoline, paint, building materials and many other sources. Lead is commonly found in soil and dust in the urban environment because, in the past, it was used in paint, gasoline and many other products.

Q: Does the heat generated by synthetic turf pose a health risk to users?

A: Like asphalt, the crumb rubber in synthetic turf fields absorbs heat from the sun and gets hotter than dirt or natural grass. On hot days, some synthetic turf fields may be too hot to play on. To protect yourself from the heat, health officials have recommended that you take the following precautions: drink lots of water, wear light and loose fitting clothes, always wear shoes, take breaks often, and exercise moderately. If you experience symptoms of heat related illness, such as dizziness, weakness, headache, nausea, vomiting or muscle cramps, move to a shaded area, drink water and rest. Seek medical attention if you do not feel better. It is especially important that adults supervising children take precautions on hot days.

Q: Are people who play on synthetic turf fields at risk of bacterial skin infections?

A: Bacterial skin infections, such as methicillin-resistant *S. aureus* (MRSA), have not been shown to be caused by synthetic turf fields. A multi-agency report to the California state legislature stated that the number of skin abrasions suffered on synthetic turf fields was greater than on natural turf fields, but the severity of the abrasions did not differ. The report found synthetic turf fields to harbor fewer bacterial species and a smaller number of live bacteria than natural turf fields.

MRSA has not been proven to be caused by synthetic turf field contact. Bacterial skin infections among athletes are due mainly to physical contact and sharing contaminated towels or sports equipment. Coaches and players should be aware of the potential for MRSA transmission and infection among athletes. All skin cuts or abrasions should be washed with soap and water and covered immediately. School athletic departments and sports leagues, should use good hygienic practices and prohibit the sharing of towels and equipment that rubs against bare skin.

Q: Should people continue to use synthetic turf fields with crumb rubber?

A: Regular physical activity is one of the most important parts of a healthy lifestyle. Synthetic turf fields allow access to open spaces for sports and physical activities. After any outdoor activity health organizations recommend that people should wash their hands before eating or drinking. On very hot days, users should limit activities, take rest breaks and drink water.

Q: What preventive measures can be taken to further reduce potential health and safety concerns of synthetic turf fields?

A: Hand-washing after using the field, especially before eating; discouraging eating while on the field; and monitoring for potential heat-related illness are recommended measures for minimizing potential risks associated with synthetic turf fields.

Q: Where can I get more information?

A: The following links provide additional information and details on the health assessment of synthetic turf fields:

- New York City Department of Health Artificial (Synthetic) Turf Fact Sheet: <http://www.nyc.gov/html/doh/html/eode/eode-turf.shtml>
- New York City Department of Health Air Quality Survey Of Synthetic Turf Fields: http://www.nyc.gov/html/doh/downloads/pdf/eode/turf_aqs_report0409.pdf
- New York City Department of Health Review of the Potential Health and Safety Risks From Synthetic Turf Fields: www.nyc.gov/html/doh/downloads/pdf/eode/turf_report_05-08.pdf
- Connecticut Department of Public Health Human Health Risk Assessment of Artificial Turf Fields: www.ct.gov/dep/lib/dep/artificialturf/dph_artificial_turf_report.pdf
- New York State Health Department Crumb-Rubber Infilled Synthetic Turf Athletic Fields Fact Sheet: http://www.health.ny.gov/environmental/outdoors/synthetic_turf/crumb-rubber_infilled/fact_sheet.htm
- Connecticut Academy of Science and Engineering Committee Report: Peer Review of an Evaluation of the Health and Environmental Impacts Associated with Synthetic Turf Playing Fields: www.ct.gov/dep/lib/dep/artificialturf/case_artificial_turf_review_report.pdf
- California Department of Resources Recycling and Recovery Report to the Legislature on Health Impacts of Outdoor Artificial and Natural Turf Fields: <http://www.calrecycle.ca.gov/publications/documents/tires/2011007.pdf>