

Additional Artificial Turf Issues

Fields in NJ:

- There are an estimated 150 artificial turf fields currently installed in New Jersey, though the exact number is not known. The number of playgrounds and day care facilities with artificial turf or crumb rubber surfaces is also unknown.
- Substantial local investments in artificial turf fields have occurred, are on-going, or are planned, by municipalities, public and private schools, and colleges and universities. Under the NJDEP's Green Acres program, several communities are using state resources to install artificial turf fields. Some of these installations have become locally controversial.

Composition of artificial turf fields:

- Artificial turf fields consist of plastic fibers woven into a plastic mesh backing. Many of the more recently installed fields consist of plastic fibers, and also include an in-fill material. This in-fill material is commonly composed of rubber pellets made from recycled automobile tires, known as "crumb rubber." Other in-fill materials may also be used instead of, or mixed with, crumb rubber. (Crumb rubber may be used by itself as a playground surface.) Much of the health concern has focused on crumb rubber.

Other Health and safety concerns:

Tire Crumb Rubber

- Health and safety concerns are being raised about artificial turf fields. These concerns are related to physical properties of the fields and potential chemical exposures from in-fill materials (especially crumb rubber from recycled tires) and the turf fibers.
- Crumb rubber is composed of a variety of synthetic organic chemicals, some of which can out-gas or leach from the material. These include volatile organic chemicals such as toluene, benzene, and aldehydes, and other organic chemicals such as phthalates and polycyclic aromatic hydrocarbons (PAHs). A study by the Connecticut Agricultural Experiment Station reported out-gassing and leaching of benzothiazole, butylated hydroxyanisole, *n*-hexadecane, and 4-(*t*-octyl) phenol from crumb rubber. Crumb rubber may contain high levels of zinc, and possibly other metals such as arsenic, cadmium, chromium, lead or selenium.
- Because crumb rubber in-fill is produced from recycled tires from a variety of sources, it is possible that these products vary in their composition and potential toxicity.

Heat, abrasion and infections

- Other health concerns about artificial turf fields have been raised, including abrasions and infections, high surface temperatures, and injury rates.

- Artificial turf surfaces are reported to have temperatures significantly higher than natural grass fields, increasing the risk of burns, dehydration and heat exhaustion in children.

Health Risk Assessments on Tire Crumb Rubber

- The California Office of Environmental Health Hazard Assessment (CaOEHHA) reported on potential health risks of recycled tire crumb rubber on playgrounds. CaOEHHA concluded that it is "...unlikely that a onetime ingestion of tire shreds would produce adverse [non-cancer] health effects." Predicted cancer risk from one-time exposure "...is well below the *de minimis* level of...one in one million..."
- The Norwegian Institute of Public Health conducted a risk assessment in 2006 and concluded that exposures to volatile and other synthetic organic chemicals does not pose an increased risk of adverse health effects, including allergy and cancer. The report acknowledged that there may be transient health impacts related to odors and mucous membrane irritation.
- The French National Institute for Industrial Environment and Risks concluded that "...health risks associated with the inhalation of [volatile organic chemicals] and aldehydes emitted by artificial grass fields in outdoor situations give no cause for concern towards human health."
- The NJDEP Division of Science, Research and Technology produced a literature review in June 2007 of health risk assessments related to tire crumb rubber on artificial turf fields. The review concluded that, "There is very limited information available...concerning environmental and human safety aspects of crumb rubber products." The NJDEP further stated that, "...with the possible exception of allergic reactions among individuals sensitized to latex, rubber and related products, there are no obvious toxicological concerns raised that crumb rubber in its intended outdoor use... would cause adverse health effects..." The review is available at: <http://www.state.nj.us/dep/dsr/research/whitepaper%20-%20rubber.pdf>
- Environment and Human Health, Inc. (EHHI), a private organization based in Connecticut, citing the Connecticut Agricultural Experiment Station study, challenged the conclusions of previous health risk assessments. EHHI concluded that "...tire crumbs constitute a chemical exposure for humans and the environment..." and that "...health endpoints of concern are numerous, including acute [and chronic] irritation of the lungs, skin and eyes." EHHI recommended a "...moratorium on installing any new fields or playgrounds..." until more research is done to assess potential exposures and health risks.
- A fact sheet prepared by the Connecticut Department of Public Health states that, "Based upon the current evidence, a public health risk appears unlikely. However, there is still uncertainty and additional investigation is warranted." CDPH recommended that those considering installation of artificial turf fields should "...consider these uncertainties as part of the array of issues evaluated when deciding whether to install artificial turf fields (e.g., cost, maintenance, public acceptability)."

Recommendations for lead concerns:

- Those who have installed, are installing, or plan to install artificial turf fields should ask vendors to conduct appropriate testing to determine the levels of potential contaminants, including lead, in the turf and associated materials.
- If a field is found to have high lead levels, field managers can consider limiting access to the field, especially for the most vulnerable population of children under 7 years of age.
- As a precaution, until further guidance is available, custodians of all turf fields, but especially turf fields with nylon fibers, can implement the following recommendations, in addition to testing their turf field:
 - Dust suppression, in the form of watering down the field, can be conducted before and after the field is being utilized,
 - Encourage individuals who use the field to perform aggressive hand/body washing after playing on the field;
 - Clothes that were worn on the field should be taken off inside out and washed separately.

Additional Recommendations:

- Despite the national scope of the issue, there is no federal guidance regarding artificial turf or limits on components of these products.
- Some municipalities are developing procedures to take when ambient temperature and humidity is high, to minimize the risks of burns, dehydration and heat exhaustion in athletes.
- Children should shower and wash thoroughly after playing on artificial turf fields.