

What is artificial turf?

A modern artificial field surface has three layers — shock absorbing, drainage, and surface. The surface has silicone-coated polyethylene/polypropylene plastic blades that simulate grass and a several-inch layer of “infill” that keeps the blades upright. The infill varies by manufacturer and may include ground-up recycled tires, ground-up soles of athletic shoes, silica sand, and/or new thermoplastic or rubber material. This infill is known as “crumb rubber.”



Grass playing fields vs. synthetic turf

How will your district decide?

Disposal

One artificial field contains approximately 120 tons of crumb rubber or 26,000 recycled tires. Costs for removal and disposal could be significant. Many fields now in service will soon be reaching the end of their life spans and many questions about disposal remain to be answered.

Rick Doyle, president of the Synthetic Turf Council, says the infill could be cleaned and reused; put to another purpose, such as for rubber asphalt; incinerated; used in place of soil to separate landfill layers; or otherwise recycled. Typically, however, it is sent to a landfill.

There are no real disposal issues with grass fields.

Wear and durability

Wear and durability information should be obtained and compared. With regular maintenance, synthetic turf fields usually last up to 10 years and are typically warranted for seven to eight years. Properly installed and maintained natural grass fields remain viable for about 15 years.

Hazardous Materials

School districts should ask for a *Material Safety Data Sheet* (MSDS) on each turf component and anticipated maintenance product. If any are of unknown composition or have no available MSDS, that should raise a serious warning.

Hazardous materials associated with natural grass fields include pesticides and fertilizers, unless the grass is being grown organically.

Hazardous materials associated with artificial turf include ingredients in the polyethylene/polypropylene blades, the crumb rubber infill, and ingredients in maintenance products like disinfectants, anti-static cling treatments, and solvents for seam repair.

Recycled crumb rubber contains a number of chemicals that are known or suspected to cause adverse health effects. The most common types of synthetic rubber used in tires are composed of ethylene-propylene and styrene-butadiene combined with vulcanizing agents, fillers, plasticizers, and antioxidants in different quantities, depending on the manufacturer. Tire rubber contains metals (zinc, selenium, lead, and cadmium), phthalates, polyaromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs). One company produces “Ecofill” infill, asserting that it contains fewer toxins.

An MSDS will give some information on the health hazards of the

product. An MSDS is written by a product’s manufacturer and should contain a list of hazardous ingredients and may contain the percent of each ingredient in the product. Ingredients may be missing if they are considered a trade secret.

Heat Stress

Artificial surfaces are dramatically hotter than natural grass fields, reaching temperatures up to 150 F, possibly contributing to burns, dehydration, and heat exhaustion. They may be too hot to play on at times. Watering cools them down, but they reheat quickly.

Sanitation

Soils in grass fields contain bacteria which decompose body fluids, algae, and dog, goose, and other droppings. These do not decompose on artificial turf.

Proper maintenance of synthetic turf requires that the fields be sanitized to remove body fluids and droppings. Manufacturers market sanitizing products for this purpose. According to *Synthetic Turf Sports Fields: A Construction and Maintenance Manual*, published by the American Sports Builders Association in 2006, some synthetic turf owners disinfect their fields as often as twice a month, with more frequent cleanings for sideline areas, where contaminants concentrate.

Sports injuries

Several studies reported no differences in the incidence, severity, nature, or cause of injuries in soccer teams who played on grass versus new-generation synthetic turf. However, injuries may depend on the type of sport being played.

A five-year prospective study of football injuries among high school teams showed that there were about 10 percent more injuries when games were played on synthetic turf than when played on grass surfaces.

Conversely, the risk of serious head and knee injuries was greater on grass fields.

Environmental Health

Crumb rubber can move around on the field and it sticks to the skin, shoes, and clothing. It can end up inside schools, vehicles, and homes and in the land and water around the field. Some metals in the rubber leach into water.

Artificial turf creates environmental hot spots, while natural turf creates cool spots. A natural grass field supports birds, animals, and insects. It generates oxygen, reduces greenhouse gases, and filters and purifies rainwater. Artificial turf does not.

References

Synthetic Turf: Health Debate Takes Root, 2008

Environmental Health Perspectives, published by the National Institute of Environmental Health Sciences.

www.ehponline.org/docs/2008/11/6-3/toc.html

Artificial Turf: Exposures to Ground-Up Rubber Tires, 2007 Environment and Human Health, Inc.,

www.ehhi.org/reports/turf/

Toxicants in Artificial Turf, 2007

Rachel’s Democracy & Health News #937 Environmental Research Foundation

www.rachel.org/bulletin/index.cfm?St=4

Facts about Artificial Turf & Natural Grass

Turfgrass Producers International – www.turfgrassod.org

Commonly Asked Questions about Synthetic Turf

Synthetic Turf Council

www.syntheticurfCouncil.org/

DHSS Calls for Federal Action on Potential Lead Hazard Posed by Artificial Turf

www.state.nj.us/health/artificial-turf/index.shtml

Locations of Artificial Turf Fields

The most comprehensive listing is available at the website of FieldTurf Tarkett, www.fieldturftarkett.com, which has about 55 percent of the market in the U.S. For other turf manufacturers and systems builders go to www.syntheticurfCouncil.org and click on the link to members.

In school districts across the nation, the question being asked is “grass or plastic?” Figures from the Synthetic Turf Council, a trade organization based in Atlanta, show that 10 years ago there were seven new-generation fields installed in the United States. Today there are 3,500. Many school districts covet synthetic turf because it always looks good and can be played on year-round.

The debate, sometimes fierce, is over whether synthetic turf is safe for human and environmental health, and whether its advantages outweigh those of natural grass.

Local associations can encourage a rational comparison of artificial turf and natural grass on the basis of the considerations that follow.

Costs

School districts should be encouraged to request comprehensive bid proposals from both artificial turf and natural grass producers. The bids should include “cradle-to-grave” costs, including field preparation, installation, maintenance and repair for an extended period of time (at least five years), and disposal.

Natural grass with onsite native soil is usually the least expensive to install. The more prepared the soil is, the more expensive natural grass installations become. Synthetic turf is usually the most expensive to install.

Maintenance

Artificial turf fields require personnel and equipment for dragging, infill additions, redistribution, cleaning, and carpet repair. Specialized equipment includes a sweeper, groomer, field magnet, and roller.

Natural grass fields require personnel and equipment for mowing, watering, fertilizing, and pesticide application. Specialized equipment includes a mower, fertilizer applicator, aerator, and vacuum.

Both types of fields require a line painter, cart for towing equipment, and a top dresser. Both also require irrigation and perhaps boom spraying. In the case of artificial turf these are for cooling as opposed to grass growth.

Local associations should be alert to the need to retrain grounds staff if they will be required to maintain artificial turf. Some maintenance tasks may require specialized equipment and skills that could be outsourced.