

PRC Meeting

March 7, 2024

Written Communications

From: [Andrea Wald](#)
To: [City of Cupertino Parks and Recreation Commission](#)
Subject: upgrades to Jollyman and Memorial Park
Date: Wednesday, March 6, 2024 7:28:33 PM
Attachments: [TIURT Report 2018-003. Playground+Surfacing.pdf](#)
[PIP+playgrounds+Too+hot+and+toxic+for+Child's+play+kmm+7-24+-2017b.pdf](#)
[Andrea's speech to Cupertino City Council 3-5-24.docx](#)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear P&R Commission Members,

I've just recently been made aware that plans are already complete for the upgrades of Jollyman Park. I'm not sure about the grassy areas but do understand that the All Inclusive Playground will have some Artificial Turf and also PIP. These are both very harmful materials. I hope there is time to figure out how to complete the playground project without using toxic materials. Please see the two attached documents.

I attended the City Council meeting last night and made a short, 3 minute comment regarding Artificial Turf and its harmful effects. I've attached a copy of that speech. I'm hopeful that the grassy areas at Jollyman will remain as grass and not be changed over to Artificial Turf.

As for Artificial Turf, I'd be very curious to know where you are getting that small piece of AT from for the slide area at Jollyman. There is a lawsuit in the works against Lowes and Home Depot for the AT they are selling consumers and not advising them of the toxic chemicals in that turf (although ALL Artificial Turf contains PFAS which are toxic - research showing a link to many health issues):

<https://ceh.org/latest/press-releases/new-testing-reveals-high-levels-of-toxic-pfas-in-artificial-turf/>

I'm also very curious as to the plans for the upgrades at Memorial Park. In reading through the very lengthy plan document I did not see any mention of specific materials that are planned to be used - except for one reference to rubberized play area. Wondering if that is what is known as PIP - toxic material.

I would hope, based upon Cupertino's Climate Action Plan goals, that any materials that are counter to achieving those goals would be avoided. Artificial Turf and PIP surfaces both are detrimental to the city's goals.

I would be happy to meet up with any commission member and provide additional insight and materials to help the commission make the best choices for presenting to City Council. I'm sure everyone would want to do what's best for the environment and for the health and safety of those using the parks and their amenities.

Sincerely,

Andrea Wald
waldmba@gmail.com
C: 408-431-3774

PS - Please take a look at this very important document (link below) prepared by Santa Clara County Medical Association regarding their views on Artificial Turf based on extensive research.

[https://www.secma.org/programs/environmental-health.aspx#:~:text=Recommendation%20to%20replace%20artificial%20turf%20with%20natural%20turf%20for%20Saratoga%20High%20School%20\(2023\)](https://www.secma.org/programs/environmental-health.aspx#:~:text=Recommendation%20to%20replace%20artificial%20turf%20with%20natural%20turf%20for%20Saratoga%20High%20School%20(2023))

Playground Surfacing

Choosing Safer Materials for Children's Health and the Environment



Acknowledgments

This report was prepared by Lindsey Pollard and Rachel Massey from the Toxics Use Reduction Institute, with input from Molly Jacobs and Polly Hoppin from the Lowell Center for Sustainable Production; Elizabeth Harriman, Joy Onasch, and Heather Tenney from the Toxics Use Reduction Institute; Rebekah Thomson from the Field Fund; Kara Rubio from Women for a Healthy Environment; and Katherine Butler from Recycling Works Massachusetts. Work on this report was supported by a grant from The Heinz Endowments.

Cover photo: A school playground in Westford, Massachusetts, with engineered wood fiber surfacing.

Playground Surfacing: Choosing Safer Materials for Children's Health and the Environment

Introduction

Playground surfacing helps to protect children as they walk, run, jump, fall, and interact with their surroundings in the course of play. A range of materials are sold as playground surfacing. Some of these materials contain chemicals of concern for human health and the environment. In response to requests from communities, TURI has compiled information on a range of playground surfacing options, with a particular focus on chemicals that may be found in these materials, and how they may affect playground users.

Vulnerable populations, such as pregnant women and children, may be especially sensitive to hazards posed by chemicals found in synthetic playground materials. Children are uniquely vulnerable to the effects of toxic chemicals because their organ

systems are developing rapidly and their detoxification mechanisms are immature. Children are also more likely to have hand-to-mouth exposure to environmental contaminants than adults.¹ For these reasons, it is particularly important to make careful choices about children's exposures.

Based on TURI's research on chemical contents of playground surfacing materials, wood products—especially engineered wood fiber (EWF) tested and verified to be free of chromated copper arsenate (CCA)—are safer choices for health and the environment. Synthetic products pose potential chemical hazards that can be avoided by using alternative materials.

Playground Surfacing Materials: Overview

Playground surfacing materials are installed underneath play equipment to cushion falls. They can be made from natural or synthetic materials including sand, pea gravel, wood, and rubber. These materials come in a variety of forms; for example, wood options include wood chips or bark mulch, EWF, or bonded EWF (EWF bound with adhesive). Rubber materials are used in products such as shredded waste tires (also referred to as rubber mulch), rubber tiles and pour-in-place (PIP) surfacing. The U.S. Consumer Product Safety Commission (CPSC) states that grass, dirt, concrete, asphalt, or other hard surfaces are not considered protective surfacing options for playgrounds.² Protective fall materials are typically installed on top of a prepared sub-base of gravel, soil, geotextile, or an impervious concrete slab.

Surfacing materials fall into two broad categories: loose-fill surfacing materials and unitary surfacing materials. Table 1 provides an overview of these material categories.

- **Loose-fill surfacing** material consists of loose particles such as sand, pea gravel, EWF, or rubber mulch/shredded tires.²
- **Unitary surfacing** materials consist of rubber tiles, rubber mats, or other materials (e.g., rubber granule, plastic, or EWF) held in place with a binder. These materials may be poured in place and cured at the playground site to form a unitary surface.² Unitary surfacing installation designs vary between companies, but typically include a base layer beneath a “decorative” top layer of bonded materials. The base layer is usually composed of either

gravel, concrete or asphalt.^{3, 4} For PIP and artificial grass installation, a cushioning layer made of either loose or bonded shredded

waste tire is usually installed between the base and top layer.

Table 1. Playground surfacing materials: Loose-fill and unitary options	
Category	Material
Loose-fill	Engineered wood fibers (EWF)*
	Wood chips or bark mulch
	Sand
	Pea gravel
	Rubber mulch
Unitary	Bonded EWF*
	Pour-in-place (PIP) rubber surfacing*
	Rubber tiles and mats*
	Artificial grass*

* Americans with Disabilities Act (ADA) compliant

Health and Environmental Hazards

Chemicals of concern

Some materials used in playground surfacing contain toxic chemicals, creating potential hazards for manufacturers, installers, playground users, and the environment. This section provides a brief overview of chemical hazards that may be relevant when choosing a playground surfacing material.

Synthetic surfacing materials. A variety of rubbers or plastics can be used in playground surfacing. Loose-fill rubber products are generally made with shredded waste tires. Unitary rubber, including tiles and PIP surfacing, is made with granulated particles processed from materials such as waste tires, thermoplastic elastomer (TPE), or ethylene propylene diene terpolymer rubber (EPDM), and held together with chemical binders and adhesives. An additional material sometimes used is thermoplastic vulcanizate (TPV). In TPV, a vulcanized product such as EPDM is combined or coated with a thermoplastic, such as polypropylene. Chemicals of concern are found in both loose-fill recycled tire rubber and unitary

products.^{5, 6} Pigments added to tire materials may also be a source of concern.

Tires are primarily composed of styrene butadiene rubber (SBR). They also contain a wide variety of intentionally added chemicals, such as stabilizers, fillers, and vulcanization (curing) agents. Additional substances can adhere to tires during use.⁵ Some of these ingredients are chemicals known to be hazardous to human health, such as polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and heavy metals, such as lead. A number of PAHs have been identified as known or suspected human carcinogens by the International Agency for Research on Cancer.⁷ Many of these PAHs (e.g. benz(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, chrysene, and dibenz(a,h)anthracene) have been found in waste tire rubber, in the air around the rubber, or in leachate from the rubber according to an EPA literature review.⁸ Acute VOC exposure can cause eye, nose, and throat irritation, headaches,

and nausea; longer-term exposure can cause damage to internal organs.⁹

Several VOCs that are known or suspected carcinogens, such as benzene and hexane, have been measured in recycled tire materials.⁸ Metals found in recycled tires, such as lead, pose concerns as well. For example, even low levels of lead in a child's blood can result in behavior and learning problems, slowed growth, and anemia.¹⁰ Concerns associated with some other chemicals found in tires (e.g., phthalates) include endocrine disruption.⁸

TPE and EPDM are often marketed as alternatives to recycled tires in unitary surfacing. These materials may potentially pose a lower level of concern than recycled tires, but they can contain

hazardous chemicals as well. In addition, both TPE and EPDM can include a variety of polymers and additives. For this reason, it is difficult or impossible to make broad statements about the safety of a given product unless one has access to more detailed information.

TURI reviewed a safety data sheet for a brand of artificial turf infill material made with TPE. The TPE was composed of styrene block copolymer, paraffin oil, calcium carbonate (chalk), carbon black, polyethylene, and unspecified stabilizers and antioxidants.¹¹ TPE used in playgrounds could have a similar composition, or could contain other chemicals not noted here. In general, EPDM rubber can contain PAHs, VOCs and a range of additives including carbon black, oils, and minerals.¹²

Recycled waste tire material in playgrounds: A study by the Consumer Product Safety Commission (CPSC)

The "Federal Research Action Plan: Crumb Rubber" is a multi-agency study including the CPSC, Environmental Protection Agency and the Centers for Disease Control, created to investigate the potential health and environmental effects of chemicals found in recreational surfacing made from recycled tires. As one element of this study, the CPSC used a combination of focus groups, field observations, and a survey of parents and child-care providers to collect information on children's behavior when playing on loose-fill and unitary surfacing made from recycled tires. The study shows that children frequently pick up or pick at, mouth, chew, or fall on surfaces.^a The CPSC found that the study findings raise exposure concerns that deserve further investigation. The CPSC offers the following precautions for limiting exposure to materials made from recycled tires.

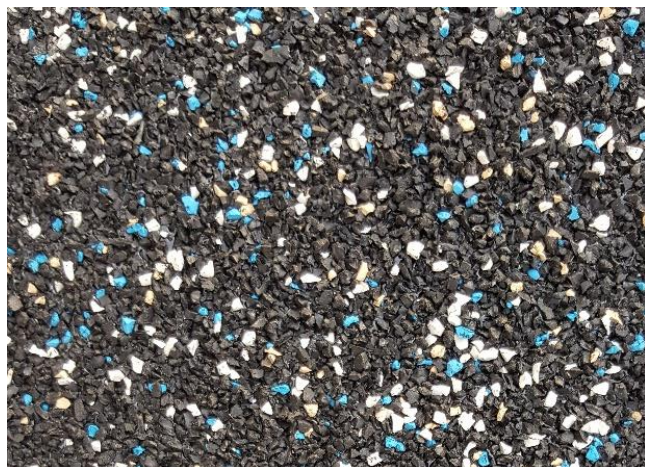
1. "Avoid mouth contact with playground surfacing materials, including mouthing, chewing, or swallowing playground rubber. This may pose a choking hazard, regardless of chemical exposure.
2. Avoid eating food or drinking beverages while directly on playground surfaces, and wash hands before handling food.
3. Limit the time at a playground on extremely hot days.
4. Clean hands and other areas of exposed skin after visiting the playground, and consider changing clothes if evidence of tire materials (e.g., black marks or dust) is visible on fabrics.
5. Clean any toys that were used on a playground after the visit."^b

^a Harsanyi, S. 2018. Summary of Playground Surfacing Focus Groups. United States Consumer Product Safety Commission. Retrieved from https://www.cpsc.gov/s3fs-public/Playground_Surfacing_Focus_Group_Report_2018.pdf

^b U.S. Consumer Product Safety Commission. 2018. Federal research action plan: crumb rubber. Retrieved from Crumb Rubber Information Center: <https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center>

Another synthetic surfacing option on the market is artificial grass, generally composed of plastic grass fibers and nylon or plastic backing atop a polyurethane cushioning layer, fabric liner, and/or shredded waste tires.¹³ Many brands use waste tire granules or sand as an infill to hold the artificial grass in place. The chemical constituents of the waste tire materials pose health and environmental concerns. Ingredients found in the fibers and/or cushioning may also be of concern.¹⁴

Ingredients used in synthetic playground materials vary between brands. It is important for playground decision-makers to be aware of what chemical constituents are present in material options under consideration by asking vendors or manufacturers directly for detailed safety data sheets, test data, and catalogs.



PIP consists of EPDM, TPE, or waste tire granules, held in place with adhesives.

Binders and adhesives. Rubber, artificial grass, and bonded wood unitary surfacing materials contain binder and adhesive chemicals. The binder ingredients used to make and bind unitary rubber tiles, pour-in-place (PIP), and bonded EWF vary depending on brand. Urethanes are typically used to bind rubber and/or TPE granules together, and to glue rubber tiles or artificial grass pieces together, according to manufacturer safety data sheets reviewed by TURI. Urethanes are made using chemicals in the diisocyanate family, such as

methylene diphenyl diisocyanate (MDI). In general, diisocyanates are asthmagens and dermal and lung sensitizers.^{15, 16} Hazardous chemicals found in binders mainly pose an occupational inhalation hazard during manufacturing and installation. However, if the cured binder contains any unreacted monomer, this could potentially create exposures for playground users as well.¹⁶



EWF colored green and bonded together with chemical adhesive.

Sand and pea gravel. Playground sand may contain trace amounts of crystalline silica (quartz) dust. Airborne crystalline silica dust exposure is known to cause pulmonary diseases, including cancer, in an occupational setting.¹⁷ There are several brands of sand on the market that advertise to be free of crystalline silica dust. According to manufacturer safety data sheets. Pea gravel is primarily made from quartz, which does not pose chemical concerns when in stable, solid form.

Wood. Loose-fill wood chips, bark mulch and EWF are all made from raw wood. Wood chips are made from ground fresh trees, and bark mulch is a byproduct of the industrial paper and lumber industries. EWF looks similar to wood chips and is manufactured similarly to bark mulch, but is designed specifically for use as playground safety surface material.² Wood products can only be labeled EWF if they meet the specific particle size,

consistency, purity, and drainage standards described in American Society for Testing and Materials (ASTM) 2075: *Standard specification for engineered wood fiber*.² EWF is also tested for levels of soluble hazardous elements such as lead, chromium, cadmium, and arsenic.¹⁸

The CPSC states in the *Public Playground Safety Handbook* that treated wood must not be used in playground surfacing, as it may contain CCA.² CCA is an insecticide and wood preservative composed of arsenic, chromium, and copper.¹⁹ The CPSC also states that wood playground surfacing manufacturers must provide test data on material toxicity to ensure that no CCA-treated wood has been mixed in with playground materials. The CPSC suggests avoiding use of any wooden playground surfacing products where the CCA content is unknown. Therefore, it is important for decision-makers to request and review test data before installing.

With regard to chemicals only, the least hazardous choices for playground handlers and users are: loose-fill wood products tested for absence of CCA; pea gravel; and sand tested for absence of crystalline silica dust. A summary of health and environmental hazard information for all materials is presented in Table 4.



A playground in Lowell, MA, with wood chip surfacing.

Environmental concerns

The primary environmental concern associated with playground surfacing is the potential for synthetic surfacing to produce contaminated runoff water. Numerous studies show that metals such as zinc, and toxic chemicals such as PAHs and phthalates, can leach from shredded rubber into natural environments.⁸ This means that the leached hazardous substances can be carried into natural systems by stormwater or irrigation runoff. Even small amounts of these toxicants can create negative effects on aquatic life.⁵ Any of the synthetic material options can also cause general pollution issues since the synthetic pieces can migrate outside of intended play areas.



Loose synthetic PIP granules can migrate into the environment. These particles were found in an area adjacent to a playground located in Somerville, MA.

Unitary surfacing installation may also lead to loss of water-permeable surface area. Overall, playground surfacing installation designs and material porosity vary between companies, allowing for different drainage capabilities. If the sub-base is an impervious material, such as concrete, or the fall protection material allows for only minimal water filtration to the sub-base, the playground area may disrupt rainwater infiltration. Loss of stormwater filtration through soil leads to lowered water quality and a higher quantity of stormwater runoff into natural water systems, like rivers and wetlands.²⁰



As unitary synthetic surfacing begins to age, it may deteriorate and expose the loose-fill cushioning layer underneath. This layer is typically made with shredded waste tires.

TURI consulted Recycle Works Massachusetts on disposal options available for different surfacing materials. End of life disposal options are limited for synthetic materials used on playgrounds. Rubber mulch can only be recycled at specialized facilities for a fee. In general, unitary synthetic products are not recyclable because of their adhesives, and they may not be reused because the materials are usually well worn by the end of their life. Synthetic materials that cannot be recycled or reused are disposed in a landfill for a fee, and do not biodegrade. In contrast, wood materials can be composted onsite, or through a company. Many composting facilities in Massachusetts will pick up or receive these materials for no charge. Used sand and pea gravel may be sifted and reused on other playgrounds, or in different applications, such as landscaping.

Heat hazards

Rubber has a higher potential to cause contact burns as it can heat up and transfer heat quickly to skin.²¹ Thermal burns on playgrounds can occasionally result in serious injuries.²² CPSC reported 29 thermal burns associated with

playgrounds (mostly second- and third-degree burns) between 2001 and 2008. Of these, 14 involved playground surfacing.²³

There are few published studies focused directly on playground surfacing temperatures and burns. However, one study in a hot climate found that unshaded rubber surfacing reached temperatures at or above the CPSC temperature threshold for thermal burn injury.²¹

Dangerously hot temperatures on playgrounds, created by heat absorbing materials, can also create a microscale “heat island.”²¹ A parents’ group in Massachusetts provided TURI with temperature data. For example, on a day when the air temperature measured 75° F, the parents’ group documented a temperature of 171° F on a PIP playground surface.²⁴ Research led by the Center for Sports Surface Research at the University of Pennsylvania indicates that all artificial turf reaches higher temperatures than natural grass.²⁵



A parents’ group in West Tisbury, MA, recorded a PIP surface temperature of 171.1° F with an air temperature of 75° F.

Other potential hazards

Loose-fill materials, in general, have the potential to hide foreign objects, and are more likely to be used by children as “play material” (i.e., throwing or putting in mouth). Wood and pea gravel

surfacing have the potential to grow mold, though mold growth can be avoided by ensuring adequate drainage on and around the play area. Drainage planning is recommended for all loose-fill products in order to minimize decomposition, mold growth, and particle migration.²

Performance Criteria

Critical fall height ratings

The CPSC requires that playground surfacing materials be tested for critical height, or “an approximation of the fall height below which a life-threatening head injury would not be expected to occur.”² Because playground materials may degrade or be displaced over time, the CPSC suggests testing the impact performance of playground materials annually. Communities can ask their chosen playground installation company about annual field tests for impact performance. Communities may also choose to install play equipment that requires lower fall height protection.

Loose-fill surfaces have standard fill depths that offer protection for fall injury prevention. Table 2 shows the minimum required depth of each compressed loose-fill material, and the maximum

fall height at which injuries will be prevented, according to CPSC. It is important to note that EWF, wood chips, and rubber mulch all offer the same amount of fall protection. Loose-fill material compresses by at least 25% due to use and weathering, which must be taken into account during installation and when planning long-term maintenance.² Loose-fill material depths will also decrease over time due to displacement of materials outside of the play area. Critical height depths must be maintained over time by “topping-off” materials in order to preserve performance.

Unitary surface materials have varied quality and shock-absorption properties, and therefore do not have standard fill depths for fall heights.² Manufacturers must supply critical fall height test data for all playground surfacing, including specifications for unitary rubber tiles or pour-in-place materials.²

Table 2. Minimum surfacing depths for compressed loose-fill materials		
Compressed surfacing depth (inches)	Loose-fill material	Maximum protected fall height (feet)
6	Rubber mulch	10
9	Wood chips, EWF	10
9	Bark mulch (non-CCA)	7
9	Pea gravel	5
9	Sand	4

Source: U.S. Consumer Product Safety Commission, 2015

Accessibility

Playground accessibility for persons with disabilities is an important aspect of playground planning. In order for a surfacing material to be labeled as compliant with regulations within the Americans with Disabilities Act (ADA), it must fulfill wheelchair accessibility specifications described in ASTM 1951: *Standard specification for determination of accessibility of surface systems under and around playground equipment*.²

EWF and unitary surfacing options are designed to be ADA compliant.² The wood pieces in EWF are sized to “knit” together when compacted, causing the pieces to remain in place, creating an even, accessible surface. EWF must be raked to maintain evenness, especially under swings and slides, in order to maintain performance. Provided that they are in good condition, unitary rubber and bonded wood are inherently stable due to the chemical adhesives holding the base cushioning material in place.

Costs

We contacted several suppliers and installers of playground surfacing materials to provide some general, preliminary information on costs associated with material discussed in this fact sheet. Table 3 summarizes these findings. This

information is provided for general reference only; costs are likely to be variable, and this overview does not necessarily cover all the factors that may be relevant for an individual community.

Table 3. Cost estimates for initial installation, regular maintenance, and disposal of playground surfacing materials for a 2500 square-foot area^a

Material	Initial cost	Maintenance activities/cost	Disposal ^b
EWF, woodchips, bark mulch	<ul style="list-style-type: none"> Raw materials: \$2,600 Materials and installation with drainage: \$7,500 	<ul style="list-style-type: none"> Raking back into play area, top-off every 3-5 years Cost of raw materials for 10% top-off: \$300 	Compost, many companies offer free drop-off or pick up
Sand	<ul style="list-style-type: none"> Raw materials: \$3,000 	<ul style="list-style-type: none"> Raking and leveling, top-off every 2-3 years. Cost of raw materials for 10% top-off: \$300 	Reused (e.g., surfacing in community areas) or repurposed at a facility
Pea gravel	<ul style="list-style-type: none"> Raw materials: \$5,000 	<ul style="list-style-type: none"> Raking back into play area, top-off every 1-2 years Cost of raw materials for 10% top-off: \$500 	Reused (e.g., other playgrounds or landscaping)
Artificial grass	<ul style="list-style-type: none"> Materials, installation of sub-base, and surfacing materials: \$38,000 	<ul style="list-style-type: none"> Sweeping, blowing or vacuuming, inspection for damage Patching heavily worn areas 	Landfill, recycling or reuse may be possible
Unitary rubber (PIP)	<ul style="list-style-type: none"> Materials, excavation, installation of sub-base and PIP materials: \$50,000 	<ul style="list-style-type: none"> Sweeping, blowing or vacuuming, inspection for damage Patching cracks and heavily worn areas 	Landfill drop-off for a fee
Rubber mulch	<ul style="list-style-type: none"> Raw materials: \$8,000 Materials and installation: \$15,000 	<ul style="list-style-type: none"> Raking back into play area, top-off every 1-2 years Cost of raw materials for 10% top-off: \$800 	Recycled at specialized facilities for a fee

^a Fill volumes were estimated using minimum fill depths in Table 2. Cost figures were provided by several suppliers in October 2018. Costs are likely to vary by time, location, brand, and functional requirements.

^b For all options except artificial grass, disposal information was provided by personal correspondence with Recycle Works Massachusetts. TURI did not obtain detailed information on options for disposing of artificial grass.

Questions to Consider when Choosing a Playground Surfacing Material

In researching this topic, TURI found variability in chemical contents, physical characteristics, and/or installation techniques between brands of unitary surfacing products. Below are a number of questions that decision-makers may want to ask manufacturers and vendors in order to gain a more complete understanding of topics such as material contents, installation design, and disposal options.

- What are the chemical constituents of all layers of material?
- What tests have been conducted to check for chemicals in the material?
- What method of disposal is used for the materials when it is time to replace them?
- Are the materials permeable? What are the drainage options for the surfacing?
- What critical fall height protection can be achieved with the material?
- Can the installation company test fall protection performance annually?
- What is the surface temperature of the material located in the sun with air temperature above 80° F?
- What is the lifespan of the materials and cost of maintenance?

Summary

From an environmental and health standpoint, wood products, especially EWF tested and verified free of CCA, are safer choices for playground surfacing material based on chemical content. EWF also offers high fall protection and ADA accessibility when correct material depth and evenness are maintained. Synthetic products, made with or without recycled tires, pose potential chemical hazards that can be avoided by using

alternative materials. Table 4 summarizes the overall characteristics for each material reviewed in this document. Playground planners are encouraged to request and carefully review data on contents and toxicity. Planners are also encouraged to read installation instructions from manufacturers on their specific materials in order to make the safest and most informed choices.

Table 4. Summary of health, environmental, and performance criteria

Materials are listed in order of least concern (green) to greatest concern (orange) to playground users based on chemical hazard criteria only. TURI has attempted to identify the key concerns for each material.

Health & Environmental Hazard Criteria					Performance Criteria	
Material (color coding based on chemical hazards)	Possible chemicals of concern	Health effects associated with chemicals of concern	Other human health concerns ^a	Environmental concerns	Fall protection	ADA compliant
EWF, wood chips, bark mulch Tested for absence of CCA	— ^e	— ^e	Mold growth possible ^b	— ^e	High	Yes (EWF only)
Sand Tested for absence of crystalline silica dust	— ^e	— ^e	— ^e	— ^e	Low	No
Pea gravel	— ^e	— ^e	— ^e	— ^e	Low	No
EWF, wood chips, bark mulch Not tested for absence of CCA	Traces of CCA possible. ²	Arsenic exposure can increase risk of certain types of cancer. ¹⁹	Mold growth possible ^b	Possible runoff contamination	High	Yes (EWF only)
Sand Not tested for absence of crystalline silica dust	Traces of crystalline silica dust. ²⁶	Inhalation of crystalline silica dust can cause respiratory disease, including lung cancer. ¹⁷	— ^e	— ^e	Low	No
Bonded EWF	Binding substances can contain hazardous chemicals (such as MDI) before they have been cured. ²⁷	Respiratory issues, skin sensitization, development of asthma and possible carcinogenicity. (Primarily an occupational exposure concern.) ¹⁶	— ^e	Possibility of impervious surface ^d	Depends on installation design	Yes
Artificial grass	PAHs, VOCs, heavy metals, phthalates, and others found in some infills; binding substances can contain hazardous chemicals (such as MDI) before they have been cured; grass blades can pose concerns as well. ^{5, 6, 8, 11, 12, 14}	Carcinogenicity, endocrine disruption, respiratory irritation or skin irritation. ^{7, 9, 10}	Heat hazard	Possible runoff contamination, migration of synthetic materials offsite	Depends on installation design	Yes
Rubber tiles, PIP	PAHs, VOCs, heavy metals, phthalates; binding substances can contain hazardous chemicals (such as MDI) before they have been cured. ^{5, 6, 8, 11, 12}	Carcinogenicity, respiratory irritation or skin irritation. (Substances in binder primarily present occupational exposure concerns.) ^{7, 9, 10}	Heat hazard	Possible runoff contamination, possibility of impervious surface, migration of synthetic materials offsite ^d	Depends on installation design	Yes
Loose-fill rubber	PAHs, VOCs, heavy metals, phthalates, and others. ^{c, 5, 8}	Carcinogenicity, endocrine disruption, respiratory irritation or skin irritation. (CPSC notes that children frequently pick up or pick at, mouth, chew, or fall on loose-fill surfacing.) ^{7, 9, 10, 28}	Heat hazard	Possible runoff contamination, migration of synthetic materials offsite	High	No

a. Information on abrasion hazards associated with playground surfacing was not included in this report.

b. Mold growth is unlikely provided that drainage is adequate.

c. Exposure is likely to be greater with loose-fill rubber as children may handle and play with the material.

d. Some installation designs include the addition of an impervious concrete sub-base.

e. TURI did not identify any priority concerns for hazards covered in this report.

Glossary of Acronyms

ADA	Americans with Disabilities Act
ASTM	American Society for Testing and Materials
CCA	Chromated copper arsenate
CPSC	The U.S. Consumer Product Safety Commission
EPA	The U.S. Environmental Protection Agency
EPDM	Ethylene propylene diene terpolymer
EWF	Engineered wood fiber
MDI	Methylene diphenyl diisocyanate
PAH	Polyaromatic hydrocarbon
PIP	Pour-in-place
SRB	Styrene butadiene rubber
TPE	Thermoplastic elastomer
TPV	Thermoplastic vulcanizate
VOC	Volatile organic compound

References

1. Landrigan, P. 1998. Environmental Hazards for Children in USA. *International Journal of Occupational Medicine and Environmental Health*, 11(2), 189–94.
2. U.S Consumer Product Safety Commission. 2015. *Public Playground Safety Handbook*. Bethesda, MD.
3. Surface America. (n.d.). Recreational and Athletic Surfacing. Retrieved November 14, 2018, from <https://www.surfaceamerica.com/product/playbound-poured-in-place/>
4. Game Time. 2018. Poured in place rubber. Retrieved November 14, 2018, from <https://www.gametime.com/playground-surfacing/poured-in-place-rubber>
5. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, infill made from recycled tires*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_Recycled_Tires
6. Llompart, M., Sanchez-Prado, L., Pablo Lamas, J., Garcia-Jares, C., Roca, E., & Dagnac, T. 2013. Hazardous organic chemicals in rubber recycled tire playgrounds and pavers. *Chemosphere*, 90(2), 423–431.
7. International Agency for Research on Cancer. 2018. Agents classified by the IARC monographs, Volumes 1-123. Retrieved from <https://monographs.iarc.fr/agents-classified-by-the-iarc/>
8. U.S. Environmental Protection Agency. 2016. *Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields and Playgrounds, Status Report*. Retrieved from https://www.epa.gov/sites/production/files/2016-12/documents/federal_research_action_plan_on_recycled_tire_crumb_used_on_playing_fields_and_playgrounds_status_report.pdf
9. U.S. Environmental Protection Agency. 2017. Volatile organic compounds' impact on indoor air quality. Retrieved November 11, 2018, from <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>
10. U.S. Environmental Protection Agency. 2018. Learn about lead. Retrieved from <https://www.epa.gov/lead/learn-about-lead>
11. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, chemicals in alternative synthetic infills: thermoplastics elastomer (TPE)*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_TPE
12. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, chemicals in alternative sythetic infills: EPDM*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_EPDM
13. Zeager Bros, Inc. 2009. *Recreation surface catalog*. Retrieved from <https://www.zeager.com/content/uploads/2018/09/Zeager-Recreation-Surfaces-Brochure-2019.pdf>

14. Pavilonis, B. T., Weisel, C. P., Buckley, B., & Lioy, P. J. 2014. Bioaccessibility and risk of exposure to metals and SVOCs in artificial turf field fill materials and fibers. *Risk analysis : an official publication of the Society for Risk Analysis*, 34(1), 44–55.
15. Toxics Use Reduction Institute. 1999. *Massachusetts Chemical Fact Sheet: 4,4-Methylene Diphenyl Isocyanate*. Retrieved from <https://www.turi.org/content/download/182/1439/file/Fact Sheet Methylene Diphenyl Isocyanate 2000.pdf>
16. U.S. Environmental Protection Agency. 2011. *Methylene diphenyl diisocyanate (MDI) and related compounds action plan [RIN 2070-ZA15]*. Retrieved from <https://www.epa.gov/sites/production/files/2015-09/documents/mdi.pdf>
17. National Institute for Occupational Safety and Health. 2002. *Health effects of occupational exposure to respirable crystalline silica*.
18. American Society for Testing and Materials. 2015. *Standard specification for engineered wood fiber for use as a playground safety surface under and around playground equipment, active standard ASTM F2075*.
19. U.S. Environmental Protection Agency. (n.d.). Chromated Arsenicals (CCA). *November 2016*. Retrieved from <https://www.epa.gov/ingredients-used-pesticide-products/chromated-arsenicals-cca>
20. Brabec, E., Shulte, S., & Richards, P. L. 2002. Impervious surfaces and water quality: a review of current literature and its implications for watershed planning. *Journal of Planning Literature*, 16(4), 499–514.
21. Vanos, J. K., Middel, A., McKercher, G. R., Kuras, E. R., & Ruddell, B. L. 2016. Hot playgrounds and children's health: A multiscale analysis of surface temperatures in Arizona, USA. *Landscape and Urban Planning*, 146, 29–42.
22. Ford, G., Moriarty, A., Riches, D., & Walker, S. 2011. *Playground Equipment: Classification & Burn Analysis*. Retrieved from https://web.wpi.edu/Pubs/E-project/Available/E-project-122111-202154/unrestricted/WPI_Final_Report_IQP-CPSC.pdf
23. O'Brien, C. W. 2009. *Injuries and investigated deaths associated with playground equipment, 2001-2008*.
24. Data provided by Rebekah Thomson, personal communication. (n.d.).
25. Center for Sports Surface Research. 2012. *Synthetic turf heat evaluation: progress report*. Pennsylvania State University, University Park, PA.
26. Quikrete. 2011. *Playsand Safety Data Sheet*. Atlanta, GA. Retrieved from <https://www.quikrete.com/pdfs/msds-b4-playsand.pdf>
27. Advanced Polymer Technology. 2017. *Woodcarpet binder safety data sheet*. Harmony, PA.
28. U.S Consumer Product Safety Commission. 2018. *Federal research action plan: crumb rubber*. Retrieved from <https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center>

Playground Surfacing

Choosing Safer Materials for Children's Health and the Environment

The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to help Massachusetts companies and communities reduce the use of toxic chemicals.



Toxics Use Reduction Institute
University of Massachusetts Lowell
126 John Street, Suite 14
Lowell, Massachusetts 01852
(978) 934-3275
www.turi.org

Too **hot** for Child's play - Rubber's Pretty Poisons



History

<https://www.playgroundprofessionals.com/magazine/issues/2014/12/evolution-playground-surfacing112>

..."Rubber nuggets or chips derived from tire recycling had been offered as playground surfaces since the 1970s- {pushed by a collaboration between the EPA and industry}. However, these black, ...dirty products found limited acceptance among playground operators. Then, in the late 1990s, a Ohio chemist found a way to **coat the rubber particles with colored pigments and, voilà, colored loose-fill rubber playground surfacing (aka rubber mulch) was born. The coloration technique spread rapidly** and a number of rubber recyclers soon were supplying the product."...

PIP RUBBER HEAT!

Kemp Mill Park July 15

PIP
154



AIR
and
GRASS
95



Asphalt
128



Wood
Fiber
103



Manufacturer Maintenance Instructions- Fibar Poured-In-Place Rubber

- <http://fibar.com/Playgrounds/pip/FibarPIP-%20Maintenance-Instruction2017.pdf>

Debris in the EPDM Top Surface

- Keeping the surface clean of debris is critical in maintaining the product. Sand, dirt, organic material (leaves, twigs) gum etc must be cleaned from the surface. ***If not removed, these particles can work their way into the EPDM surface layer, to severely reduce or eliminate the impact attenuation properties serious injury or death can occur, and the playground should not be used until the surface is cleaned and the particles removed.***
- **drainage can also be affected.**

PIP- breaking down exposing tire waste



Fairland Park Playground

Plastic Synturf & Rubber Playgrounds

BURN



BURNS from Rubber playgrounds and Plastic synturf Fields



Blair HS Plastic Synturf field WITHOUT rubber

IMPACT PROTECTION PROBLEMS

<http://center4research.org/child-teen-health/early-childhood-development/caution-children-at-play-on-potentially-toxic-surfaces/>

California State Study

- 1/3 of the rubber / tire waste playgrounds did NOT pass head impact safety criteria (and the impact safety decreased with rising temperature)
- ALL of the wood fiber mulch playgrounds passed .

TOXIC SUBSTANCE EXPOSURE

Many but one example: A study on rubber mulch (and solid rubber mats) found harmful chemicals in all sampled, often at high levels (Llompart et al 2012).

Most contained high concentrations of several carcinogenic PAHs.
Several of the identified PAHs can be released into the air by heat, and when that happens children are likely to inhale them. *The heat needed to do this (140 degrees Fahrenheit/ 60 °C) is common on these surfaces but many of the chemicals also became airborne at a much lower temperature of 77 °F (25 °C).*

The authors concluded that **the use of rubber recycled tires on playgrounds “should be restricted or even prohibited ,,,”**

CONCLUSIONS?

•STOP!

- Do NOT INSTALL RUBBER or PLASTIC SURFACING with or without tire waste
- INSTALL improved NATURAL surfaces for children at play
- **WARN USERS** of the high heat potential
- **TEST** ALL RUBBER& PLASTIC surfaces for IMPACT ATTENUATION REGULARLY
- **SHUT DOWN** playgrounds and fields over 120 deg surface temperature

City Council members,

My name is Andrea Wald. I'm speaking on behalf of a group called "Community for Natural Play Surfaces". Our goal is to educate as many as we can to the ills of Artificial Turf in hopes of avoiding decisions to be made for installation in our local cities and throughout CA. We are very worried about the impact that Artificial Turf is having on our environment and the health and safety of all.

Our first major victory was recently when, with our input and community support, the Sunnyvale City Council unanimously voted to keep natural grass in a local park instead of opting for Artificial Turf. They are also considering a ban.

Now for a quick Artificial Turf lesson and relation to Cupertino's Climate Action Plan goals.

The first main point in the Climate Action Plan is (quote) "to reduce our city's greenhouse gas emissions to net zero by the year 2040". The section basically mentions transportation: Artificial Turf is not manufactured in CA and not only are greenhouse gases emitted during manufacture but also when its transported here on huge flatbed trucks.

Another section talks about: Natural Systems and Biodiversity. The plan mentions trees, how to manage and protect them and how they naturally capture and store carbon, thereby reducing the greenhouse gas impact. There is mention of conducting an urban heat island study in order to identify areas in Cupertino for planting trees. The same absolutely holds true for natural grass. Covering acres of fields with PLASTIC actually emits CO2 and methane, rather than absorbing CO2. Artificial turf gets up to 80 degrees hotter than natural grass creating a "heat island effect". This and the emission of greenhouse gases is leading to an increase in Global Warming. Artificial turf can also undermine biodiversity as it does not provide habitat for insects and other wildlife and blocks soil from sequestering carbon dioxide.

Next on the Climate Action Plan is the call to "Reduce Waste" – specifically by "reducing unnecessary consumption and increasing waste diversion from landfill". Artificial turf is plastic, lasts only 8-10 years, is not recyclable and ends up in landfill, incinerated or even dumped in open fields, where the toxic chemicals continue to leach into the ground. And since there is no landfill space available nearby nor factories in CA that burn it, it is shipped off on those same flatbed trucks that brought it here to begin with.

The toxic chemicals in Artificial Turf plus the microplastics that break off the fields and flow into our waterways are harmful to aquatic life and end up in our drinking water. Studies are now showing significant health and safety concerns. There is an increased rate of injuries on Artificial Turf and studies are showing links to many serious health

issues like cancers, interference with one's own immune system, and increase in thyroid disease to name a few.

Artificial turf is not water-free. A lot is used in the manufacturing process and is needed to clean the fields. As temperatures rise with Global Warming, either fields will need to be shut down or watered down with significant amounts of water – with the cooling effect only lasting about 20 minutes.

The Climate Action Plan notes that the community of Cupertino should do its fair share and that by working together they can lead the way for other communities by demonstrating effective leadership, innovative thinking and commitment to addressing the climate crisis now.

The choice between natural and artificial turf happens within this context. This is a climate decision. This is an environmental decision. This is a solid waste decision. This decision and many others will shape our future atmosphere and environment.

I hope when the time comes that City Council is asked to make decisions on landscape for city properties that Artificial Turf is not part of those discussions. I also would hope that you might also consider a full out ban for both city properties and residential use – as did the City of Milbrae. Please look at the big picture when considering the desirability of artificial turf.

PRC Meeting

March 7, 2024

Written Communications

Item #3

Review Fiscal Year 2024-
2025 Community Funding
Grant Applications and
Program Evaluation
Process

From: [Jean Bedord](#)
To: [City of Cupertino Parks and Recreation Commission](#); [Jenny Koverman](#)
Subject: Fwd: Omniware networks
Date: Thursday, March 7, 2024 8:18:45 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Parks and Recreation Commission,

I am forwarding this to the entire commission at the request of the chair. I am President of the Cupertino Senior Center Advisory Council, and have also been appointed to the Sourcewise Advisory Board. Sourcewise is county funded and provides services for the aging, and works in cooperation with our Senior Center.

Warm regards,

Jean Bedord

----- Forwarded message -----

From: **Jean Bedord** <Jean@bedord.com>
Date: Thu, Mar 7, 2024 at 4:26 PM
Subject: Omniware networks
To: Jennifer Shearin <shearin.jen@gmail.com>

Jennifer,

These are duplicated programs with the Cupertino Senior Center. Look at the 50+ insert in the Parks and Recreation catalog. The senior center is organizing a health expo on May 10. There are monthly movies, and a number of social activities in addition to classes and bus trips. There is a Stay Active Fund which subsidizes membership. The Cherry Blossom festival (no charge) utilizes the senior center. No mention of transportation to Hakone Gardens - which is the big issue with seniors.

" For instance, we have organized outing to the bay wetlands which are beyond their normal daily reach. We have selected recreation areas with paved roads / trails accessible to handicapped seniors. We have hosted health fair booths to provide information and resources of mental health. We organized senior talent shows which received tremendous positive feedback from seniors as they enhanced their confidence, and showcased their talents. We are also organizing group tour, such as a complimentary culture tour of Hakone Japanese Garden where we'll introduce Japanese culture, guide the tour the garden, provide kimono photography opportunities, and offer Japanese souvenirs. "

The picture of the Talent Show may be Live Oak Adult Day Program - and that may be justified. The other pictures don't look like Cupertino locations.....

Warm regards,

Jean Bedord

Cell: 408-966-6174