

September 6, 2012

Todd Stevenson  
Office of the Secretary  
Consumer Product Safety Commission  
Washington, DC 20207

**Re: Petition for a Rulemaking on Surface Heat from Artificial Turf**

Dear Secretary Stevenson,

Dangerous heat from artificial turf sports fields (made from tire crumb and plastic fibers) is a well-documented phenomenon. Stories regarding exposure to extreme temperatures present on these fields have been reported all over the country. From children who are advised not to take off their shoes on artificial turf in Florida,<sup>1</sup> to soccer players complaining about burns through their shoes in New York,<sup>2</sup> the widespread problems with surface heat on artificial turf are overdue for regulation from the CPSC.

Recent extreme temperatures in the Northeast caused New York City Park Advocates to issue a warning regarding the dangers of artificial surface heat temperatures, which resulted in children's feet being burned. The warning states "[a]rtificial turf fields can reach over 170 degrees. By 9:15 am temperatures on artificial turf fields can reach over 140 degrees", and further warns that more than a dozen of New York City children a year are hospitalized from similar burns from playground surfaces.<sup>3</sup>

These overheated conditions do not only occur in a heat wave, however; filed temperatures of over 168 degrees were registered on a day with an air temperature of just 73 degrees.<sup>4</sup> Exposing children and adults to these extreme temperatures will inevitably result in more than just burns and blisters. No one should have to die before the CPSC takes action on regulating surface heat on artificial turf. As the number of the fields reaches past 4000, with hundreds of thousands of children playing on them, and thousands more fields planned, the CPSC needs to establish safe guidelines for the field use, or create a requirement for cooler surfaces.

**Background**

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<sup>1</sup> <http://www.nbc-2.com/story/10703517/park-astroturf-too-hot-to-play-on>

<sup>2</sup> [http://voices.washingtonpost.com/soccerinsider/2009/04/united\\_sights\\_and\\_sounds.html?wprss=soccerinsider](http://voices.washingtonpost.com/soccerinsider/2009/04/united_sights_and_sounds.html?wprss=soccerinsider)

<sup>3</sup> [http://abclocal.go.com/wabc/story?section=news/local/new\\_york&id=8709614](http://abclocal.go.com/wabc/story?section=news/local/new_york&id=8709614)

<sup>4</sup> <http://plantscience.psu.edu/research/centers/ssrc/documents/heat-progress-report.pdf>

In recent years, many schools, sports teams, and municipalities have switched from grass to artificial turf fields. For example, the Fairfax County, VA community has built 38 artificial turf fields in the last few years<sup>5</sup>, and has plans for up to 6 more.<sup>6</sup> FFC meeting recently said they plan a total of 150 fields, actually... this was announced in June and July this year at a community meeting with Supervisors. The reasons for the switch are commonly related to decreased upkeep and increased usability, but what the vendors aren't telling these buyers is that even on a relatively mild day, the heat absorbed by these fields from direct sunlight makes playing on them almost unbearable.

Artificial turf is generally composed of a backing layer with synthetic 'grass' blades sewn in.<sup>7</sup> This is then 'infilled' with a material that simulates dirt- typically comprised of recycled tire crumb rubber or combination of crumb rubber and sand.<sup>8</sup> These fields normally have a drainage system underneath.<sup>9</sup> The combination of black tires and other synthetic materials make these surfaces heat traps in direct sun.<sup>10</sup>

Artificial turf surfaces have registered temperatures as high as 200 degrees Fahrenheit at Brigham Young University<sup>11</sup>. Studies from the State of New York Department of Public Health and the Penn State Center for Sports Surface illustrate the incredibly high temperatures these fields reach.<sup>12</sup> Studies have found fields can regularly reach temperatures from 120- 176 degrees.<sup>13</sup> Users have complained that the high temperatures cause blisters on their feet even through their shoes.<sup>14</sup>

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<sup>5</sup> New Turf Field at Jackson Middle School, Fairfax County, Virginia, available at: <http://www.fairfaxcounty.gov/ncs/news/ni2011/jacksonturf.htm>

<sup>6</sup> Holly Hobbs, Fairfax County High Schools: Private Funding Necessary to Turf Fields, Washington Post, November 16, 2011, available at: [http://www.washingtonpost.com/local/fairfax-county-high-schools-private-funding-neccessary-to-turf-fields/2011/11/14/gIQAtgqBRN\\_story.html](http://www.washingtonpost.com/local/fairfax-county-high-schools-private-funding-neccessary-to-turf-fields/2011/11/14/gIQAtgqBRN_story.html)

<sup>7</sup> Synthetic Turf Industry, Frequently Asked Questions, available at <http://www.syntheticurfCouncil.org/displaycommon.cfm?an=1&subarticlenbr=209>

<sup>8</sup> Id.

<sup>9</sup> Id.

<sup>10</sup> Chuck Adamson, Synthetic Turf Playing Fields Present Unique Dangers, <http://cafnr.missouri.edu/research/turfgrass.php> (reporting an on-field head level temperature of 138 degrees on a 98 degree day).

<sup>11</sup> Synthetic Surfaces Heat Studies, C. Frank Williams and Gilbert E. Pulley, at 2, available at: <http://aces.nmsu.edu/programs/turf/documents/brigham-young-study.pdf>.

<sup>12</sup> State of New York Department of Health, Fact Sheet: Crumb-Rubber Infilled Synthetic Turf Athletic Fields, August 2008, at 2, available at: [http://www.health.ny.gov/environmental/outdoors/synthetic\\_turf/crumb-rubber\\_infilled/docs/fact\\_sheet.pdf](http://www.health.ny.gov/environmental/outdoors/synthetic_turf/crumb-rubber_infilled/docs/fact_sheet.pdf), Andrew S. McNitt and Dianne Petrunak, The Pennsylvania State University, Penn State Center for Sports Surface, Evaluation of Playing Surface Characteristics of Various In-filled Systems, <http://plantscience.psu.edu/research/centers/ssrc/research/infill/temperature-and-color>

<sup>13</sup> State of New York Department of Health, Fact Sheet: Crumb-Rubber Infilled Synthetic Turf Athletic Fields, August 2008, at 2, available at: [http://www.health.ny.gov/environmental/outdoors/synthetic\\_turf/crumb-rubber\\_infilled/docs/fact\\_sheet.pdf](http://www.health.ny.gov/environmental/outdoors/synthetic_turf/crumb-rubber_infilled/docs/fact_sheet.pdf) (citing fields that reach 120-178 degrees Fahrenheit).

<sup>14</sup> Williams and Pulley, supra note 4, at 1.

In order to reassure consumers about heat concerns, artificial turf companies have touted watering the synthetic turf as a way to reduce temperatures. This method has proven to be ineffective. Typically, 20 minutes after watering, the surface rebounds within 10 degrees of its pre-watering temperature.<sup>15</sup> In order for temperatures to be reduced to any reasonable level, the field would have to be continuously watered. This is a wholly impractical solution, for it would interrupt game play, and would use copious amounts of water, the reduction of which is a major reason why people switch to artificial turf.

In other efforts to confront the heat issue, the synthetic turf industry has recently promoted new types of infill to replace or reduce the crumb rubber in hopes of reducing heat.<sup>16</sup> Recent studies have shown that these mitigation measures are not enough to keep the fields comfortable.<sup>17</sup> By the company's own admission, this new technology will only reduce the heat by 15 degrees.<sup>18</sup> Even though the industry has tried to keep fields cool with new kinds of infill, studies have shown that the reduction in heat only amounts to about a 12 degree difference, which is hardly a difference at all when discussing heat at these levels.<sup>19</sup>

Even when the tire crumb is replaced, the synthetic fibers that make up the grass blades also heat up.<sup>20</sup> The time has come for the Consumer Product Safety Commission to regulate the heat from the surface of these fields.

### **Why CPSC should regulate**

Dangers presented by such high heat include heat exhaustion, heat stroke, dehydration, heat blisters on skin. People can suffer dehydration, heatstroke and thermal burns at field temperatures above 115 degrees.<sup>21</sup>

Children particularly are at risk due to their more sensitive skin and their limited judgment regarding when temperatures get too hot to play in. If there are no adults playing on

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<sup>15</sup> McNitt, A.S., D.M. Petrunak and T.J. Serensits. 2008. Temperature amelioration of synthetic turf surfaces through irrigation. Available at <http://plantscience.psu.edu/research/centers/ssrc/documents/temperature-irrigation.pdf>.

<sup>16</sup> <http://www.fieldturf.com/artificial-turf-news/terps-installing-fieldturf-surface-at-capital-one-field-at-byrd-stadium/> (Announcing the use of "Coolplay" technology that will reduce the temperature 15 degrees as compared to traditional tire infill)

<sup>17</sup> <http://plantscience.psu.edu/research/centers/ssrc/documents/heat-progress-report.pdf>

<sup>18</sup> <http://www.fieldturf.com/artificial-turf-news/terps-installing-fieldturf-surface-at-capital-one-field-at-byrd-stadium/>

<sup>19</sup> <http://plantscience.psu.edu/research/centers/ssrc/documents/heat-progress-report.pdf>. See also <http://www.sportsturfonline.com/ME2/Audiences/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications::Article&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=16DD3559CDA84F74B6459797C3B6A471> (Stating that "[a]s of right now, it is obvious that there is no "magic bullet" available to dramatically lower the surface temperature of synthetic turf. Reductions of five or even ten degrees offer little comfort when temperatures can still exceed 150° F.")

<sup>20</sup> <http://www.npr.org/templates/story/story.php?storyId=93364750&sc=emaf>

<sup>21</sup> <http://www.npr.org/templates/story/story.php?storyId=93364750&sc=emaf>

the field to feel the increase in heat, children may be exposed to extreme temperatures for longer than is safe.

The temperatures exhibited by artificial turf fields are similar to temperatures the CPSC has deemed appropriate to regulate in other contexts, particularly when children can easily come into contact with such surfaces. The surface heat of children's toys is regulated by 16 CFR 1505.51. It details the use of a test on a child's toy to see if any heated surfaces are accessible to a child in an electronic toy. Depending on the type and accessibility of a surface of an electronic toy, the acceptable surface temperature for electronically operated toys range from a low of 122 degrees Fahrenheit (a Class A surface that is likely to be grasped by the hand<sup>23</sup>), to a high of 266 degrees Fahrenheit (a Class C marked surface with a precautionary statement that can be touched without the aid of a tool<sup>24</sup>).

Dehydration and heat stroke are not the only temperature related risks presented from the fields. When tires are shredded and pulverized, their surface area increases exponentially, as does the particulate and gas yield from the tire material. Since tires are made of very harmful materials, including 24 gases found to be harmful to humans,<sup>25</sup> carbon black,(a carcinogen which makes up 30% of tires), latex, benzothiazoles, phthalates, lead, mercury, cadmium, zinc, and many other known toxins,<sup>26</sup> when the fields heat up, they become increasingly dynamic chemically, and the materials begin to interact., creating potentially very dangerous mixtures.<sup>27</sup> Of primary concern is the interaction of particles and gases, "because when particles adsorb onto the surface of gases, they become 10-20 times more toxic than the materials themselves".<sup>28</sup> The fields yield continuously, but become more dynamic and more toxic as they heat up.<sup>29</sup>

While the CPSC has not issued any regulations regarding surface heat on artificial turf surfaces and other tire-derived products, it has acknowledged the danger. The CPSC issued a Burn Safety Awareness on Public Playgrounds fact sheet in April, 2012 informing parents that they should be careful about surface heat on playgrounds, including "dark colored plastics and rubbers".<sup>30</sup> This fact sheet provides statistics about injuries from burns caused by playground equipment, and give parents tips for ensuring the playground equipment is cool enough for their children.

The artificial turf industry itself is aware of the dangers of heat on these fields. In an interview with NPR, Rick Doyle, president of the Synthetic Turf Council stated "'I don't think

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<sup>23</sup> 16 CFR 1505.6(g)(2)(i))

<sup>24</sup> 16 CFR 1505.8

<sup>25</sup> (Norway Study),

<sup>26</sup> (Source: EPA 2009 Scoping Study and website),

<sup>27</sup> (David Brown)

<sup>28</sup> (Dr. David Brown, ScD, "Artificial Turf Fields: A Troubling Perspective" documentary, April 2012, LensCapOff Productions).

<sup>29</sup> (David Brown.)

<sup>30</sup> <http://www.cpsc.gov/cpsc/pub/pubs/3200.pdf>

anyone in our industry would suggest it's a good idea to play on a surface that's that hot."<sup>31</sup> If the industry itself acknowledges the dangers, the CPSC should not hesitate in promulgating regulations.

In sum, children face real dangers when playing on artificial turf. The CPSC is aware of the problem of heated surfaces on playgrounds. There has been no acknowledgement, however, of the dangers of heated artificial turf. No rulemaking has been promulgated, nor any advisory opinions issued regarding artificial turf, rubber mulch on playgrounds, or rubber mats on playgrounds and their risk of overheating.

Children come into contact with artificial fields all across the country. Over the course of a game, a child may fall on, sit on, or otherwise come into direct contact with the artificial turf surface. If the CPSC finds it necessary to regulate the surface heat of one type of children's toy, they should regulate the surface heat of a manufactured surface intended for intense use and interaction with children.

### **Petition for Rulemaking**

PEER hereby requests the CPSC to issue the following regulations, pursuant to their authority to hear petitions under 5 U.S.C. § 553(e) (2006). Specifically, PEER requests:

1. **The CPSC should implement heat safety guidelines for artificial turf usage.** A comprehensive study should be undertaken that evaluates the impact air temperature, humidity, and cloud cover have on turf temperature. The CPSC should then implement guidelines for use. This should be in the form of a simple chart that provides air temperatures and atmospheric conditions, with a clear limit at which activity should be cautioned against. One such method for evaluating acceptable conditions is the Wet Bulb Globe Temperature (WBGT), developed by the U.S. Marine Corp and currently used by the U.S. Occupational Safety & Health Administration (OSHA) and other organizations.<sup>32</sup>

In situations where the surface of artificial turf fields reach temperatures above a certain temperature, consumers should be warned not to use the surface while barefoot, and to avoid touching the surface with bare skin. Regulations should also be issued regarding temperatures at which it is no longer safe to be on the fields at all, such as when heat stroke and heat exhaustion becomes likely, and when shoes heat up to the point of discomfort.<sup>33</sup>

2. **The CPSC should implement monitoring guidelines of surface temperature.** Users, particularly supervisors of children's usage of artificial turf fields, should be advised to monitor the temperature of the field every hour in certain conditions.

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<sup>31</sup> <http://www.npr.org/templates/story/story.php?storyId=93364750&sc=emaf>

<sup>32</sup> [http://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_4.html#iii:4\\_3](http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html#iii:4_3)

<sup>33</sup> Penn state recommends not using the fields above 120 degrees.

3. **The CPSC should mandate posting of heat safety guidelines on fields.** Signs should be posted on all artificial turf surfaces that states the guidelines established above. The signs should be easily understood and provide clear guidance for conditions where certain activities could become hazardous to ones health.

## **Conclusion**

PEER asks that CPSC proceeds with the rulemaking outlined above, and looks forward to a response within a reasonable time period, as required by 15 U.S.C. § 2058(i). Thank you for your attention to this matter.

Sincerely,

Jeff Ruch  
PEER Executive Director