

Testimony of Dr. David Brown  
Director of Public Health Toxicology, EHHI  
Before the Environmental Affairs Committee  
Maryland General Assembly  
In Support of HB 896  
March 1, 2013

Tire crumb off-gases 24 harmful compounds. We know the off-gassing yield increases as the tire crumb heats. All synthetic turf fields grow hot in the presence of sunlight and summer time temperatures. Carbon black, which makes up 30 percent of black tires, is carcinogenic and breaks down into very small particles. Those small carbon black particles adsorb (attach) onto the particle surface the other toxic gases, which then provide ...a pathway to the deep lung, as the child breathes during exercise. These gas/particle mixtures are 10-20 times more toxic than the materials alone. Air pollution studies reveal that these mixtures cause serious disease at much more dilute levels than what might be expected from playing sports on top of 30,000 pulverized tires.

The Norwegian Institute of Public Health found that volatile organic compounds from tire crumb infill can be inhaled by athletes during sports play. They identified 24 harmful gases under cool, indoor conditions within the 'soccer sheds'. A study by the University of Connecticut researchers commissioned by the Connecticut Department of Environmental Protection on open fields established that exposure is a hazard from both inhalation, ingestion and dermal contact. Further that as the levels of activity increased the exposures risk became higher. The study was unable with the data collected to establish the levels of risk although human exposure is clearly confirmed. These two studies establish two critical points: 1) the presence of toxic materials released from the surfaces of the fields and three pathways of exposures to children. The actual health damage has been neither determined nor investigated. Children are being introduced into a natural experiment in which their health and futures are at risk.

The Norwegian Institute of Public Health report continued, "It should also be noted that little or no toxicological information is available for many of the VOCs that are present in the air in the [indoor stadiums]. . . [Furthermore], not all organic compounds in the [stadium] air have even been identified." In particular the report called for more information regarding the development of asthma and airway allergies in response to exposure to the latex in many tires.

In the summer of 2007, Environment and Human Health, Inc. commissioned the Connecticut Agricultural Experiment Station to determine whether toxic compounds from crumb rubber could be released into air or water. The report "Artificial Turf" identified 25 chemical species. Among those definitively confirmed were the irritants benzothiazole and n-hexadecane; butylated hydroxyanisole, a carcinogen and suspected endocrine disruptor; and 4-(t-octyl) phenol, a corrosive that can injure mucous membranes.

The Synthetic Turf Council, representing the synthetic turf industry said, "Claims of toxicity [EHHI report] are based on extreme laboratory testing such as the use of solvents and high temperatures to generate pollutants." EHHI stood by its studies. I was the report's author, and I can confirm that, "It is clear the tire crumbs are not inert, neither is a high temperature, nor a severe solvent extraction needed to release metals, volatile, or semi-volatile organic compounds." I confirm that the laboratory tests approximate conditions that can be found on the field, and that no solvent besides water was used.

The basic barrier to accurately assessing the safety of tire crumb is the high variability in tire construction and the lack of chemical characterization. Very few samples have been tested. There is no study with sufficient sample sizes to determine the potential hazard. Since new tires contain vastly different amounts of the toxic materials, based on the intended use, it is impossible to ensure players or gardeners or children that their personal exposure is within safe limits.

Research also indicates that both tire crumb and plastics attract additional pollutants to them as they lie on the ground. The presence of benzene in synthetic turf fields can be attributed to nearby vehicular traffic or deposition from air pollution. These fields get dirtier with time.

Although children have been exposed to ground up waste rubber for several years, no health agency has followed up on reports of elevated health effects such as asthma, skin rashes and reports of potential cancer clusters in young persons who played and practiced on fields that contained ground up waste rubber from mainly from used tires.

For a complete interview with Dr. Brown on tire crumb toxicity concerns (use IE browser):

<http://www.tirecrumbfields.com/>

**DAVID ROBERT BROWN, Sc.D.**

**CV SUMMARY**

**PROFESSIONAL HISTORY**

Fairfield University, Adjunct Professor 2000 –present  
Environment and Human Health Inc. 2000 - present  
Health Risk Consultants, Inc. 8/97 - 2008  
Northeast States for Coordinated Air Use Management (NESCAUM) 10/96 – 8/04  
Agency for Toxic Substance Disease Registry (ATSDR) 1993-1996  
Connecticut Department of Public Health (CT DPH) 1985-1993  
Northeastern University 1979-1985  
American Cyanamid Company 1977-1979  
Stauffer Chemical Company 1975-1977  
University of Maryland 1970-1975

**EDUCATION**

Sc.D. (Physiology and Toxicology) Harvard School of Public Health (1970)  
M.S. (Environmental Health Sciences) University of California, Berkeley School of Public Health (1967)  
B.S. (Biochemistry) Cornell University (1958)

**AFFILIATIONS**

National Academy of Sciences  
American Conference of Government Industrial Hygienists  
Society of Risk Analysis  
Boston Risk Assessment Group (Past-President)  
Society of Toxicology  
American Public Health Association  
American Association for the Advancement of Science  
American Association of Colleges and Pharmacy

## RELEVANT PROJECT EXPERIENCE

- Assessed potential health effects (cancer, asthma, etc.) associated with existing and proposed modifications to an asphalt plant in the Hudson Valley region.
- Provided toxicological expertise on possible health effects associated with hypothetical community exposure to blowing agent used in a Firestone building products manufacturing facility. Evaluated current literature on active ingredient as well as structurally-related compounds. Assessed exposure parameters and health implications associated with several hypothetical catastrophic events for both emergency responders and the immediately surrounding residents. Presented findings in several public meeting settings as well as with the local press.