



Department of Public Health

Lead Poisoning Prevention & Control Program Environmental & Occupational Health Assessment Program

Protocol for Bulk Sampling and Wipe Testing for Lead in Artificial Turf

1. Introduction

The turf industry adds lead chromate to some artificial turf products to add color (primarily green) and durability to the product. The potential exists for lead exposure resulting from direct contact with artificial turf fibers containing lead. Lead dust may be generated due to the degradation of the turf fibers over time. Artificial turf fibers can be made of nylon, polypropylene, polyethylene, or blends. While most products are green, colors other than green are also used. Products also come in a variety of turf fiber lengths (i.e. pile heights). The information outlined below describes the procedure for bulk sampling and wipe testing for lead in artificial turf. It is important that these guidelines are followed when collecting samples of artificial turf for lead analysis. This will assure that results accurately represent the lead contents of the product.

Bulk testing provides information about the amount of lead in the artificial turf product while wipe testing provides information about whether the turf fibers have degraded enough to create removable lead dust, which could pose an exposure concern to children using the artificial turf surface. Based on the results of the bulk sample analysis, wipe testing of the artificial turf may also be needed.

2. Instructions for Bulk Sample Collection

Sampling Plan

A sampling plan should be prepared prior to sample collection. The sampling plan is a written document that describes the purpose of sampling and the protocols followed to collect the environmental samples.

Field Kit

A field kit should contain all appropriate equipment needed for sampling such as an adequate number of sample containers, masking tape, labels, chain-of-custody forms and seals, field logbook, cutting tool, disposable gloves, ghost wipes, 1.5 ounce glass jars, indelible markers, and pens.

Field-based investigations must document the following:

- Site sketch showing the location of sampling points;
- Name and address of field contact;

- Number and volume of sample collected;
- The name and manufacturer of the turf product (if known);
- The date of installation of the product (if known).

Sample Numbers and Locations

It is important that the bulk sample adequately represents the entire area of the turf product. EPA SW 846, Chapter 9 (<http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm>), is a resource that can be followed when designing a sampling plan.

In general, only one bulk sample of turf fibers will need to be analyzed for each contiguous area of artificial turf. The bulk sample should be a composite of multiple grab samples collected from a representative set of locations across the turf area. For most installations of artificial turf at child care programs (daycares), 5 grab samples should be a sufficient number to represent the turf area. Grab samples collected in an “X” pattern across the turf area are one good way to adequately represent the whole turf area. If the turf installation is larger (such as a school or town athletic field), more than 5 grab samples will probably be needed to adequately represent the entire turf surface.

If the turf product is installed in more than one area (for example, separate play areas that are not contiguous), a bulk sample should be collected and analyzed for each separate area of turf product. In addition, if the turf product has more than one color, a bulk sample should be collected from each color. Fibers of different colors should not be mixed together in the same sample.

Collecting Turf Fibers

Using disposable gloves, at each grab sample location use an “exacto” knife or other clean cutting tool to slice the fibers at the base of the matting. Combine grab samples to make a composite of fibers to fill a 1.5 ounce clean glass jar. If more than one composite bulk sample is being collected, the cutting tool should be cleaned with a lead-free wipe (such as a Ghost Wipe) between samples.

3. Lab Analysis of Composite Bulk Samples:

To ensure the integrity of the sample from collection to data reporting, all standard chain of custody procedures must be followed. Analytical testing for lead will follow the “EPA Standard Lead Testing Method” for sample preparation; SW 846-3050B (HOT Block/Acid Digestion) and sample analysis, SW 846-6010B (ICP-AES).

4. Instructions for Dust Wipe Sample Collection

Dust wipe sampling is only required when bulk sample analysis results are $\geq 300 \text{ mg/kg}$ ($\geq 0.03\%$) for a collected composite sample lead by weight, then surface wipe testing should be performed to determine the dust lead loading on the turf surface. If the concentration of the bulk sample is $< 300 \text{ mg/kg}$ then no further action is necessary. (Please see decision flow chart.)

Sampling Plan

If it is determined that dust wipe sampling is necessary, then a dust sampling plan should be prepared prior to sample collection. The sampling plan is a written document that describes the objectives and details the individual tasks of a sampling effort and how each task will be performed.

Field Kit

A field kit should contain all appropriate equipment needed for dust wipe sampling such as an adequate number of sample containers, labels, masking tape, 1 foot ruler, chain-of-custody forms and seals, field logbook, disposable gloves, ghost wipes, indelible markers, and pens.

The field logbook and field notes must include the following:

- Site sketch showing the location of sampling point(s);
- Name and address of field contact;
- The name and manufacturer of the turf product (if known); and
- The date of installation of the product (if known).

Sample Number and Locations

The number and locations of dust wipe samples depends on the amount of deteriorated area identified from the inspectors' visual observations. One (1) dust wipe sample over one (1) square foot area should be taken for each worn area identified. If there are no worn areas, a minimum of one (1) dust wipe sample should be taken at a location (based on the inspector's professional judgement) that is likely to receive a lot of wear and tear (for example, beneath a swing set, slide, or climbing structure).

To determine the amount of lead dust on artificial turf surfaces, it is recommended that standard dust wipe collection protocol be utilized as outlined in the HUD Chapter 7 guidelines (http://www.epa.gov/wtc/panel/pdfs/5-att-2_hud_lead_wipe_sampling.pdf). Results of lead dust concentrations will be reported in micrograms per square foot (mcg/ft²).

Sampling Procedure

- Initial placement of wipe: Place the wipe at one corner of the surface to be wiped with wipe fully opened and flat on the surface.
- First wipe pass (side-to-side): With fingers together, grasp the wipe between the thumb and the palm. Press down firmly, but not excessively with both the palm and fingers (do not use the heel of the hand). Do not touch the surface with the thumb. If the wipe area is a square, proceed to wipe side-to-side with as many "S"-like motions as are necessary to completely wipe the area.
- Second wipe pass (top-to-bottom): Fold the wipe in half with the contaminated side facing inward. (The wipe can be straightened out by laying it on the wipe area, contaminated side up, and folding it over.) Once folded, place in the top corner of the

wipe area and press down firmly with the palm and fingers. Repeat wiping the area with "S"-like motions, but on the second pass, move in a top-to-bottom direction. Wipe the entire area.

5. Interpretation of Findings and Recommendations

If dust wipe testing results are greater than or equal to 40 micrograms per square foot and young children are likely to have direct exposure or contact with the turf (e.g. day care settings), the DPH recommends that access by children be restricted and the turf be replaced with a product containing less than 300 milligrams per kilogram.

Further information and guidance concerning Lead in Artificial Turf can be found at the DPH website at <http://www.ct.gov/dph/lead>.

6. Reporting Data

All bulk sample analyses and dust wipe test results shall be reported to the local Director of Health, the Commissioner of the Department of Public Health, and the owner of the facility within 30 days following receipt of the testing results.

Decision Tree: Lead in Artificial Turf Sampling

