

RX for Aging Artificial Turf Sports Fields Testing Regularly for Lead – Maintenance & Grooming Key to Artificial Turf Health

Contact:

TraceAnalysis, Inc.

(www.traceanalysis.com)

Dr. Blair Leftwich

(800) 378-1296 - Toll Free

(806) 794-1296 - Voice

6701 Aberdeen Ave., Ste.9

Lubbock, TX 79424

It is estimated that there are over 1000 existing artificial turf sports fields in the US that may test for lead (Pb) content in their fibers in excess of EPA safety standards – for schools that are ignoring the problem – that could mean trouble. Not this year, not next year – but over the long term.

It is a must that samples are taken in a proper manner to represent the field and the samples are analyzed by the proper analytical methods in order to ascertain the status of the field with regards to EPA/CPSC/HUD limits and further actions to protect against human and environmental exposure.

Following is a methodical sampling approach and EPA approved methods which will yield an accurate assessment of the field.

Sampling

Attached is a schematic for the methodical sampling of a football field to obtain composite samples that represent the entire field and accounts for the possible variation in fiber types and fiber lots without destroying the field appearance.

General Considerations:

- Fields, due to their size, may be composed of several different lots or runs of fiber from the fiber manufacturer.
- Each lot of fiber may have a different lead content. In addition, due to the varying metal content of the pigments used as coloring agents, each color may have a different lead content.
- Compositing like fibers allows many sub samples to be taken which increases the representativeness, while decreasing the overall cost of analysis.
- The total lead test including quality control requires approximately 30 fibers.

- Fibers should be collected for each type of fiber (nylon, polyethylene) and each color of fiber.
- Sub samples of like fibers should be composited into a zip lock plastic baggie.
- A field composed of nylon short fibers, polyethylene long fibers, white boundary and yard lines, blue end zones, and yellow alternative boundary lines would have a total of 5 composite samples sent to the lab for testing.
- The approximate location of each sub sample is located on the schematic.

General Samples from Field Surfaces:

- For the field samples, a zig zag path is walked across the field and fiber samples are taken at each 10yd hash mark.
- Three fibers of each type are removed by cutting the fiber off at the fiber base and placed in their respective baggie.
- There should be a total of 10 sub samples and 30 fibers in each field sample baggie.

Samples from Sidelines

The sidelines out of bound lines are usually white.

- There are 3 approximate locations on each sideline to sub sample for a composite representing the white fibers used in the field surface.
- Five fibers from each location should be sampled and placed in a sideline sample baggie for a total of 6 sub samples and 30 fibers.

Samples from End Zones:

The end zones often are different colors than the field.

- Three sub samples of 5 fibers each from each end zone should be composited together if the end zones are the same color for a total of 6 sub samples and 30 fibers.

Other Field Locations

- Other locations on the field having different colored fibers should be methodically sub sampled and a 30 fiber composite for each color should be made.

Testing

- Samples should be tested for total lead by approved EPA test methods SW846 3050B for sample preparation method and SW846 6010B for the sample analysis method.
- These methods give acid digestion followed by ICP-AES analysis.
- Alternate methods that should give the same results are sample prep by SW848 3052 (microwave digestion) and analysis methods SW846 6020(ICP-MS), 7420(AA, direct aspiration), and 7421(AA, furnace technique).
- It is important that the analytical methods be specified to the laboratory performing the analysis.
- Only laboratories certified under NELAP (National Environmental Laboratory Accreditation Program) for these methods should be used for sample analysis.
- The results will be reported in milligrams of lead per kilogram of fiber (mg/Kg).
- The applicable EPA/HUD limit is 400mg/Kg. This limit is for soil in playgrounds, but is applied to artificial turf.

Wipe Test

Wipe test is a test to determine potential exposure.

Sample Procedure

- Wipe test are performed only on fields having greater than 400 mg/Kg lead or on fields having less than 400 mg/Kg where it is desired to document non exposure to players.
- The wipe test is performed by wiping a 100cm² (roughly 4 x 4 inches) area with one moist 4 x 4 inch gauze.
 - The gauze is folded into fourths and a clean fourth is used to wipe the area vigorously for a total of eight times.
 - The wipe is then placed in a zip lock baggie and sent to the laboratory for analysis.
 - The wipe test should be analyzed individually, not composited (or grouped)

Analysis & Lab Certification

- The analytical methods are the same as those for total lead in turf (EPA SW846 3050B and 6010B or the alternative listed methods).
- The test methods should be specified to the laboratory and the laboratory needs to be NELAP (National Environmental Laboratory Accreditation Program) certified for analyzing solid samples for lead (same as for total lead in the turf samples).
- The total measurements of the area wiped has to be given to the lab as part of the calculations and documentation.
 - Results will be reported in mg of lead per 100cm² or mg of lead per ft².
 - The EPA/HUD limit is 25 ug/ft² for carpeted floors.

Recommendations and Considerations for Optimal Results

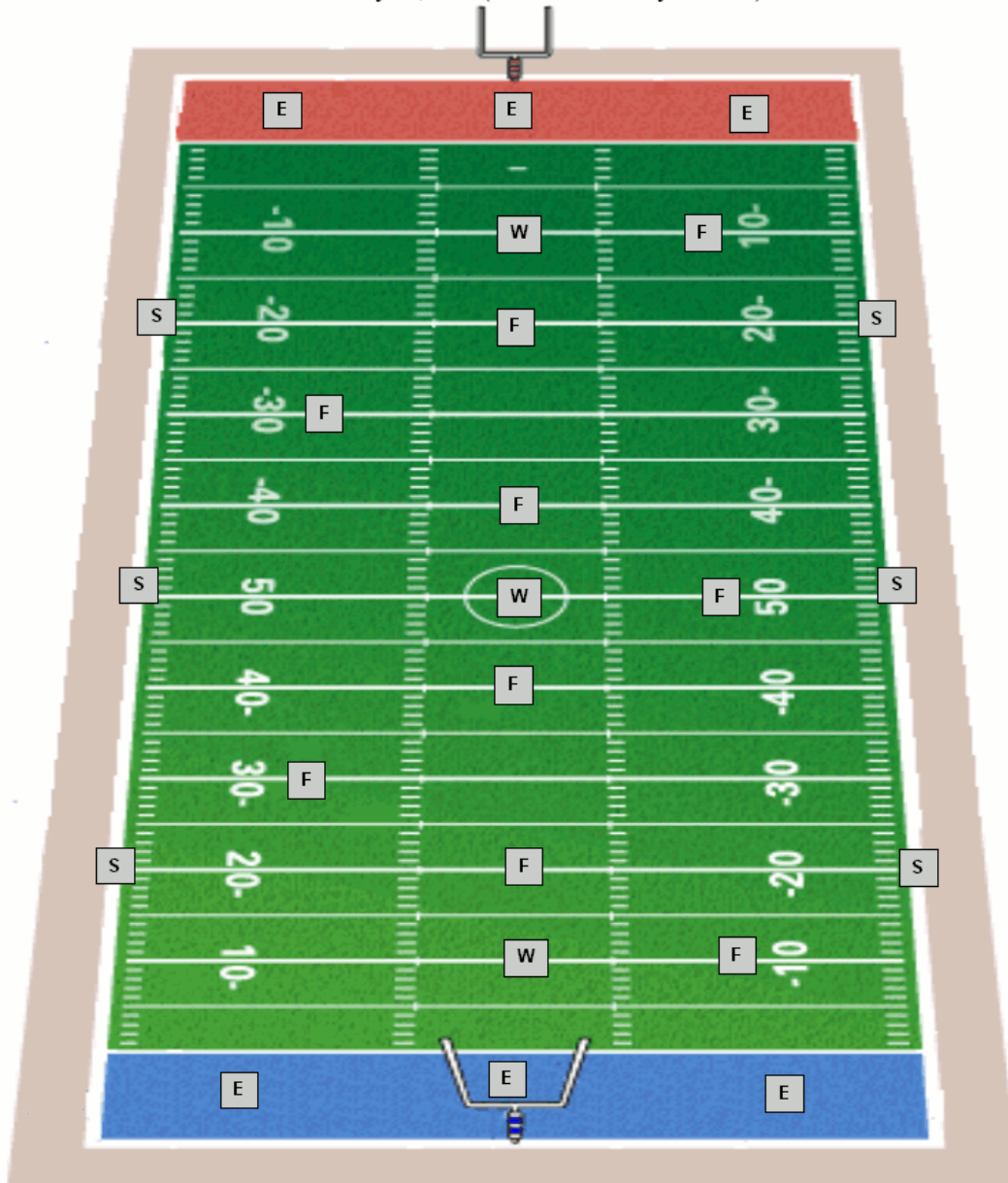
- The attached schematic shows three approximate areas of the highest use to be wiped.
- The wipe test represents only a point in time of exposure.
- Additional play or rain would affect the wipe test results.
- Field activity increases the possibility of exposure due to the mixing of lead dust and degradation of fibers.
- Rain decreases the possibility of lead exposure due to the potential lead dust and degraded fibers being leached to the lower depths.
- It is best to perform the wipe test after the maximum play time prior to rain or routine field maintenance.

Value of Wipe Test Results

- **Wipe test can be used to determine the schedule necessary for field maintenance and to verify that routine field maintenance reduces lead exposure to acceptable limits.**

Football Field Sampling for Total Lead

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F Field Sample

E End Zone Sample

S Side Line Sample

W Wipe Sample