SciAps ApNotes
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Rapid Lead Dust Wipe Analysis with the SciAps X-550

Rapid quantitative measurements to help inspectors make informed decisions on-site



Introduction

Lead dust can be invisible, but its presence can have significant consequences. After lead paint renovation, abatement, or other work that disturbs lead-containing coatings, dust wipe sampling provides an important way to determine whether lead-contaminated dust remains on a surface.

For inspectors, the challenge is time. Dust wipes are typically collected in the field and sent to a laboratory for analysis, creating a delay between sample collection and knowing whether additional cleaning or corrective action is required.

The lowering of the clearance levels has made this more challenging. It is imperative that samples which have no chance of meeting these limits be screened in the field rather than spending the money on laboratory analysis and delaying the project which comes with its own financial implications. By screening in the field, the user is able to begin the additional cleaning process immediately and fewer samples will need to be sent to the laboratory. If the result is positive on the analyzer, it will also be positive in the lab.

The SciAps X-550 provides a rapid, quantitative approach to lead dust wipe analysis. By measuring prepared dust wipe samples directly, inspectors can obtain results quickly, helping them evaluate contamination, identify areas requiring additional attention, and make more informed decisions while minimizing project delays.

Evaluation Method



To evaluate the performance of the X-550, a series of ELPAT reference dust wipe samples were analyzed. Samples represented a range of lead concentrations and were measured at multiple locations across each wipe.

Because lead distribution can vary across a dust wipe—and measurements at the corners showed greater variability—the analysis used a 5-location subset of the measurement pattern. Additional outlier locations were excluded from the final analysis. (See Table 1.)

Each sample was measured using the X-550, and the resulting measurements were averaged across the 5 selected locations. Results were compared with the corresponding reference assay values.

Test Method

A dust wipe is only useful if its analysis provides actionable information. Measuring multiple locations across the wipe helps account for the non-uniform distribution of collected dust and provides a more representative measurement of the sample.

Samples: ELPAT reference lead dust wipe samples
Measurement locations: 5 locations per sample
Analyzer: SciAps X-550, Lead Paint Mode with Dust Wipe Calibration
Measurements: Multiple XRF readings across each dust wipe
Comparison: X-550 results vs. reference assay values
Measurement time: 30 seconds per location
Sample preparation procedure: Collect sample per ASTM E1728. Let sample dry.
Sample holder/accessory: SciAps Tubular Test Stand with Dust Wipe Holder



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X-550 Results Correlated with Reference Assays

Strong Correlation Across the Tested Samples

Across the 15 non-blank samples for which both X-550 and reference assay results were available, the 5-location XRF means showed a strong positive correlation with the reference assay values ($r \approx 0.89$; $R^2 \approx 0.79$). The calculated LOD is 2.5 µg per wipe.

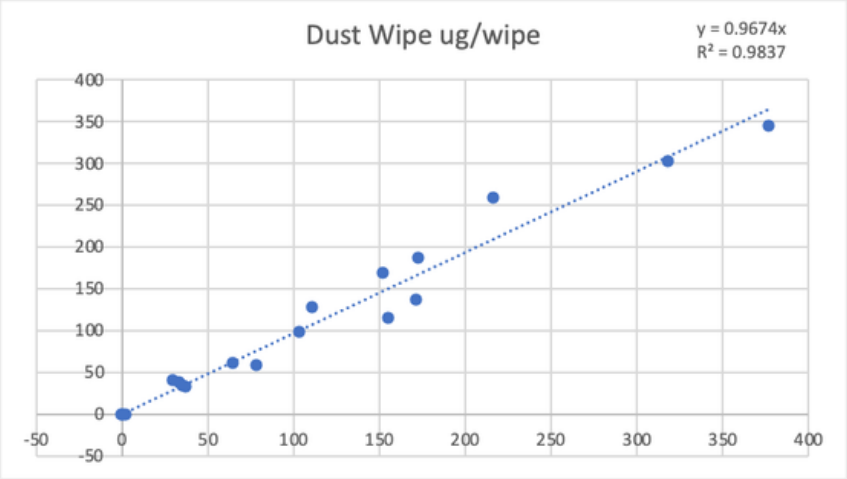


Chart 1: The results demonstrate that the X-550 responded consistently across a broad range of lead concentrations represented by the ELPAT samples. As lead concentration increased, the measured XRF response generally increased as well, providing a useful basis for rapid field assessment of lead dust wipe samples.

Operational Benefits

- **Rapid Results:** Reduce the wait between sample collection and analysis.
- **Representative Sampling:** Multiple measurements across the wipe help account for variation in lead distribution.
- **Portable Analysis:** Bring quantitative lead analysis closer to the point of inspection.
- **Immediate Decision Support:** Identify potential problem areas before leaving the site.
- **Efficient Workflow:** Help reduce delays, repeat visits, and unnecessary project downtime.



Image 1: Example of results for all five positions.

Standard	Avg. Result	Assay
130 1	36.926	33.7
130 2	77.862	58.6
130 3	171.288	136.7
130 4	215.87	259.1
131 1	64.482	61.1
131 2	110.878	128
131 4	32.982	38
131 Blank	-0.228	0
132 1	154.68	115.5
132 2	318.02	302.9
132 3	35.066	35
132 4	172.634	187
132 Blank	-0.728	0
133 1	103.148	98.2
133 2	29.544	41.5
133 3	151.574	168.9
133 4	376.98	345.6
133 Blank	1.754	0

Table 1: The 5-location approach used in this evaluation produced a clear relationship between X-550 measurements and the reference assay values across the tested concentration range.

Summary

Lead dust clearance depends on knowing what remains after work is complete. The SciAps X-550 offers inspectors a rapid way to analyze lead dust wipe samples and evaluate results across the sample surface.

In this evaluation, measurements from a 5-location analysis of ELPAT reference dust wipe samples demonstrated a strong correlation with reference assay values across the tested concentration range.

Already Own an X-550? Existing SciAps X-550 Pb analyzers can be upgraded with the new Dust Wipe application, expanding their capabilities without requiring the purchase of a new analyzer.

By bringing quantitative lead analysis closer to the point of inspection, the X-550 can help inspectors move from collecting samples to making informed decisions—faster.