



Forensic Analytical Consulting Services

Asbestos & Lead Contamination in Intact Structures After the Palisades and Eaton Wildfires

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Palisades Fire and Eaton Fire Overview

- Palisades Fire
 - Pacific Palisades/Malibu, California
 - January 7 to January 31, 2025
 - 23,448 acres
 - 6,833 structures destroyed
 - 973 structures damaged
- Eaton Fire
 - Altadena/Pasadena, California
 - January 7 to January 31, 2025
 - 14,021 acres
 - 9,418 structures destroyed
 - 1,073 structures damaged

Total Loss or Damaged Structures versus Intact Structures

- **Total loss or partially burned – testing of building materials**
 - Polarized Light Microscopy (PLM) analysis for asbestos
 - Greater than one percent asbestos analytical results and “Trace” results
 - South Coast Air Quality Management District (SCAQMD) Rule 1403
 - Lead-based paint testing and lead dust testing
- **Intact structures in proximity to burned structures – dust testing**
 - Concern for airborne contaminants migrating into intact structures
 - Intact structures may have attic vents, poorly sealed doors (e.g., garages and sheds) or HVAC intakes that provide easier indoor access for windblown dust
 - Most common concerns are airborne asbestos and lead dust landing on surfaces
 - Tracking from exterior to interior also a concern
 - Settled dust testing can detect both asbestos and lead dust

Settled Asbestos and Lead Dust - Executive Summary

ASBESTOS

- In our experience, it is rare to find elevated levels of asbestos dust outside of or within newer intact homes near burned homes in the Palisades Fire and Eaton Fire areas
- Occasionally we have found elevated levels of asbestos dust outside of or within older intact homes in these areas

LEAD

- In our experience, it is very common to find elevated levels of lead dust within and outside of both newer and older intact homes near burned homes in the Palisades Fire and Eaton Fire areas, and in surface soil

Settled Dust Testing for Asbestos

- Indoor versus outdoor
 - Sheltered versus unsheltered outdoor sample locations
 - Recent deposition versus historical deposition for indoor sample locations
 - Consideration of recent foot traffic or other disturbance; previous cleaning
- Potential sources of asbestos from structure fires
 - Building materials – flooring, roofing, acoustic ceiling, duct insulation, etc.
- Newer homes versus older homes – potential for pre-existing asbestos dust in older homes
- Inhalation hazard – re-entrainment
- No regulatory standards or limits for asbestos in settled dust
- Research results for settled asbestos dust in buildings
 - Low levels – 1,000 s/cm²; above background levels – 10,000 s/cm²; levels indicative of a significant release - 100,000 s/cm²

Settled Dust Testing for Asbestos

- ASTM 5755 method (microvacuum)
- ASTM 6480 method (wipe)
- Bulk dust sampling - PLM analysis
- Bulk dust sampling - Transmission Electron Microscopy (TEM) analysis
- Tape lift dust sampling - PLM analysis
- SCAQMD Rule 1403 – no provisions for dust testing results

Air testing for asbestos; Air testing for lead

- Airborne asbestos not expected in unoccupied structures
 - Without activity (e.g., walking on surfaces) to stir up settled asbestos dust into the air, airborne asbestos would not be expected
 - Asbestos air sampling is generally not informative in vacant structures
- Airborne lead not expected in unoccupied structures
 - Lead is a heavy element and settles from the air relatively quickly
 - Lead air sampling is generally not informative in vacant structures

Settled Asbestos Dust Testing Results - Palisades & Eaton Fires

- Indoor
 - Typical microvacuum sample results ranging from <1,000 asbestos structures per square centimeter (s/cm²) to approx. 3,000 s/cm²
 - A few sample results up to approx. 50,000 s/cm²
- Outdoor
 - Typical microvacuum and wipe sample results ranging from <1,000 s/cm² to approx. 2,000 s/cm²
 - A few sample results up to approx. 20,000 s/cm²

Settled Asbestos Dust Testing Results

- Many variables may potentially affect results
 - Proximity/density/age of burned structures, age of tested home, wind direction, rain prior to testing, occupancy/tracking, cleaning efforts (homeowner or professional), etc.

Settled Asbestos Dust Testing Results

- Remediation considerations
 - Trigger level for remediation
 - Cleaning versus disposal for complex non-porous items
 - Value/fragility of items versus cleaning costs/techniques
 - Overlap between smoke/soot/odor remediation and asbestos remediation
 - Post-remediation inspection and testing

Settled Dust Testing for Lead

- Indoor versus outdoor
 - Sheltered versus unsheltered sample locations
- Potential sources of lead dust from structure fires
 - Building materials – paint, ceramic tile glaze, lead roof flashing, etc.
 - Car batteries, fishing sinkers, stained glass, etc.
- Newer homes versus older homes – potential for pre-existing lead paint dust in older homes
- Ingestion hazard – lead is a heavy element (settles relatively quickly)
- Wipe sampling for lead (basis for limits) - AA or ICP analysis
- Microvacuum testing for lead – AA or ICP analysis – no standards
- Soil testing - AA or ICP analysis
 - Bare soil areas
 - Roof drip line

Settled Dust Testing for Lead

- **Federal EPA lead highlights**
 - Dust Lead Reportable Levels (DLRLs)– any laboratory reportable level for floors and window sills
 - Dust Lead Action Levels (DLALs) – 5 ug/ft² floors; 40 ug/ft² window sills; 100 ug/ft² window troughs
 - HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (2012, most recent edition)
- **California Department of Health (CDPH) lead highlights**
 - Title 17 Regulations incorporate portions of the HUD Guidelines (currently the 1995 edition; 1997 revision for Chapter 7, Lead-Based Paint inspection)
 - CDPH certifies lead sampling technicians, inspector/risk assessors, project monitors, abatement supervisors and abatement workers
 - Lead Dust Hazard and Clearance levels (currently) – 10 ug/ft² floors; 100 ug/ft² interior horizontal surfaces; 400 ug/ft² exterior floors and horizontal surfaces; (400 ppm for soil in children's play areas [OEHHA, 80 ppm])

Settled Lead Dust Testing Results – Palisades & Eaton Fires

- Indoor
 - Wipe sample results ranging from $<4 \text{ ug/ft}^2$ to approx. 300 ug/ft^2
 - Tends to be higher near windows and doors, and in walking pathways. Also attics, garages and sheds.
- Outdoor
 - Wipe sample results ranging from $<4 \text{ ug/ft}^2$ to approx. 300 ug/ft^2
- Soil (limited number of sites tested)
 - Ranging from $<6 \text{ ppm}$ to approx. 500 ppm

Settled Lead Dust Testing Results

- Many variables may potentially affect results
 - Proximity/density/age of burned structures, age of tested home, wind direction, rain prior to testing, occupancy/tracking, seals of windows & doors, open windows, windows broken by fire, cleaning efforts (homeowner or professional), etc.
 - Variables limit ability to see patterns

Settled Lead Dust Testing Results

- Remediation considerations
 - EPA levels versus CDPH limits to trigger remediation
 - Limited areas versus entire home
 - Remediation trigger levels for microvacuum results?
 - Cleaning versus disposal for porous/complex items
 - Value/fragility of items versus cleaning costs/techniques
 - Overlap between smoke/soot/odor cleaning and lead cleaning
 - Post-remediation inspection and testing

Thank You!

Forensic Analytical Consulting Services, Inc.

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People.

Right
Perspective.

Right
Now.