Strategies for Cleaning Hazardous Settled Dust after a Smoke Event

Settled Dust After a Large-Scale Urban Fire Event

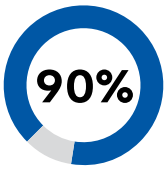
Traditional household dust consists of a mixture of dead skin, pet dander, dust mites, food debris, fibers, bacteria, dirt, pollen, absorbed chemicals, and particulate matter. Much of this originates from indoor material shedding and processes. However, after a large-scale urban fire event, such as a wildfire that spreads to an urban area or an explosion, a more complex and hazardous mixture of dust can settle within nearby homes and businesses, laden with additional contaminants such as persistent organic pollutants, toxic metals, and endocrine disruptors.

During and immediately after a large-scale urban fire event, hazardous dust may come through windows, doors, vents, and even on the soles of shoes. Dust can maintain a long memory of the specific pollutants introduced, serving as a continuous source of exposure for residents. Therefore in the aftermath of such an event, it is important to take steps to safeguard a home or business from potential contaminants by:

Continuously filtering inside air.

Frequently removing settled dust from surfaces.

Cleaning is especially important for households with children because they frequently play or crawl on the floor and can ingest dust via hand-to-mouth behavior.



— **It is important to clean settled dust because we typically spend over 90% of our time indoors.**

STEPS TO MINIMIZE POTENTIAL EXPOSURE

1. **Gather the appropriate cleaning products and equipment.** The right cleaning materials are critical when performing both an initial deep clean and routine cleaning.
   - Use microfiber or anti-static cloths, mops, and dusters. These products contain both positively- and negatively-charged fibers that attract and remove dust without the use of chemicals found in common dusting sprays. An alternative can be a wet cloth or mop.
   - Use vacuums with HEPA filtration to help remove smaller particles. These vacuums also frequently come with a variety of attachments that can be used on different surfaces and in hard-to-reach places.
   - Install new air filters in the HVAC system with the highest rating possible (MERV 11 and above).
   - Consider a standalone air cleaner for particle removal.
   - Consider water filtration cartridges for the removal of particle and chemical contaminants from fire emissions or thermally degraded water lines.
2. **Clean the air.** Unlike surface cleaning, air cleaning is a continuous process to remove airborne contaminants. While a home or building's HVAC system typically cleans the air, in the aftermath of a large-scale urban fire event, supplemental air cleaning may also be needed.
   - Use the HVAC system in recirculation mode so that outside air is not brought in until it has been verified that the outdoor air is free of the fire contamination.

- Use the highest rated minimum efficiency reporting value (MERV) filter in the HVAC system. MERV 11 or above is recommended.
- Use standalone portable air cleaners if available. They should have verified HEPA filtration, activated charcoal filtration, and a clean air delivery rate (CADR) equivalent to 2/3 or the size of the room where it is being operated. Follow the manufacturer's instructions and clean the device often. Make sure that the standalone air cleaner does not introduce ozone into the space.
- If standalone air cleaners are not available or economically feasible, consider do-it-yourself (DIY) air cleaners. Making your own air cleaner with a simple box fan, tape, and HVAC air filters can be a more affordable option, (see AN 200: Strategies to Protect Air Quality During Wildfires: Considerations for Do-It-Yourself Filtration for more information).
- Limit additional indoor particle generation processes such as frying, gas cooking, use of air fresheners, and use of cleaning chemicals.

3. **Remove dust from surfaces.** Since dust recirculates in the air, it can continuously deposit on surfaces. Routinely removing this dust is critical to minimizing exposure risks.
   - **Hard surfaces.** Use a microfiber cloth/duster or damp cloth on furniture, countertops, baseboards, fan blades, windowsills, light fixtures, blinds, and electronics. Remember to hand- or machine-wash all cloths with warm water after use.
   - **Floors.** For hardwood, tile, or vinyl floors, vacuum or dust first, and then clean with a wet microfiber mop. Clean carpet and rugs with a vacuum with HEPA filtration.
   - **Closets.** To minimize buildup of dust in closets, keep out-of-season or seldomly worn items in plastic totes or hanging bags. Use a vacuum with HEPA filtration on all hanging clothing before use.
   - **Upholstered furniture, bedding and curtains.** If possible, use a vacuum (with HEPA filtration) attachment on mattresses, comforters, curtains, and upholstered furniture. Wash bedding weekly in hot water. If an item can't be laundered, consider getting it dry cleaned.
4. **Limit the entry of additional contaminants.**
   - **Close windows and doors.** Avoid natural ventilation in the weeks after the event, such as opening a window to air out a room. Consider sealing any leaks in doors and windows.
   - **Walk-off mats.** Utilize walk-off mats at doorways and remove shoes upon entrance. This will limit the entry of additional contaminants.
   - **Source control.** Some cleaning products may introduce additional pollutants, such as volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) into the indoor environment. Only use cleaning products that have been independently verified to be low-emitting.
5. **Practice good hand hygiene, especially after cleaning.** Frequent hand washing can reduce ingestion of hazardous dust that can result from touching dust and then touching your face. While more common among children, even adults can lower exposure risks through frequent hand washing.
6. **Establish a plan and keep to it.** Be proactive and don't just clean when you see dust beginning to settle. Set up a routine cleaning schedule for the weeks and months to follow to continuously remove dust from recirculation.