# Voluntary Guidance on Indoor Air and COVID-19, Mold, Flood, and Wildfires

EPA, Office of Radiation and Indoor Air, Indoor Environments Division

### Committee on Respiratory Protection for the Public and Workers without Respiratory Protection Programs at their Workplaces

Session IV: Federal Perspectives on the Regulatory Landscape and Guidance for Public Use of Respiratory Protection January 25, 2021

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# **Overview of EPA Indoor Environments Division**

EPA Indoor Environments Division implements non-regulatory programs to reduce public health risks from poor indoor air quality (IAQ).

Goal - reduction/prevention of human exposure to harmful indoor contaminants such as radon, particulate matter (PM), indoor asthma triggers, biological contaminants including mold and viruses, environmental tobacco smoke (ETS), and volatile organic compounds (VOCs) and other chemicals indoors.



Program activities include technical guidance and assistance; public information and education; partnerships with industry, NGOs, Federal Agencies, States, Tribes, and communities; and promotion and synthesis of research.

**Title IV of the Superfund Amendments and Reauthorization Act of 1986 (SARA),** the Radon and Indoor Air Quality Research Act, gives EPA broad authority to conduct research on indoor air quality (IAQ), develop and disseminate information on IAQ, and coordinate efforts at federal, state, and local levels.

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# Indoor Air Quality (IAQ) voluntary guidance

https://www.epa.gov/indoor-air-quality-iaq

### Indoor Air and COVID-19

https://www.epa.gov/coronavirus/indoor-air-and-coronavirus-covid-19

### Mold https://www.epa.gov/mold

#### Flood

https://www.epa.gov/indoor-air-quality-iaq/resources-flood-cleanup-and-indoor-air-quality

#### Wildfires

https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq

### **Air Cleaners/HVAC Filtration**

https://www.epa.gov/indoor-air-quality-iaq/air-cleaners-and-air-filters-home







# Indoor Air and COVID-19



COVID-19 is thought to spread mainly through close person-to-person contact.

However, COVID-19 can also be spread by airborne transmission, particularly indoors.



When used properly, **air cleaners and HVAC filters** can help reduce airborne contaminants including viruses.



Proper ventilation with outside air can help reduce the concentration of airborne contaminants, including viruses, indoors.



Read all **indoor air related COVID-19 information** from EPA at: www.epa.gov/coronavirus/indoo

-air-and-coronavirus-covid-19

# Indoor Air and Coronavirus (COVID-19)



- Indoor Air in Homes and Coronavirus (COVID-19)
- Ventilation and Coronavirus (COVID-19)
- <u>Air Cleaners, HVAC Filters and Coronavirus (COVID-19)</u>
- Implementing a Layered Approach to Address COVID-19 in Public Indoor Spaces
- <u>COVID-19, Wildfires, and Indoor Air Quality</u>
- Science and Technical Resources related to Indoor Air and Coronavirus (COVID-19)
  - Indoor Air and COVID-19 Key References and Publications

#### EPA references CDC COVID-19 guidance for respiratory protection.

#### Indoor Air in Homes and Coronavirus (COVID-19)

Ensuring proper ventilation with outside air can help reduce indoor airborne contaminants, including SARS-CoV-2, the virus that causes COVID-19, and other viruses. However, by itself, increasing ventilation is not enough to protect people from exposure to the virus that causes COVID-19. When used along with other best practices (such as wearing masks, social distancing, frequent hand washing, and surface disinfection) recommended by the CDC, increasing ventilation can be part of a plan to protect yourself and your family.

# Mold Remediation in Schools and Commercial Buildings

EPA's voluntary guidance for mold remediation includes recommendations for Personal Protective Equipment (PPE), including respirators.

https://www.epa.gov/mold/moldremediation-schools-and-commercialbuildings-guide-chapter-1



### Mold Remediation in Schools and Commercial Buildings

should be covered with polyethylene sheeting and sealed with duct tape before they are removed from the containment area.

#### Personal Protective Equipment (PPE)

If the remediation job disturbs mold and mold spores become airborne, then the risk of respiratory exposure goes up. Actions that are likely to stir

up mold include: breakup of moldy porous materials such as wallboard; invasive procedures

Always use gloves and eye protection when cleaning up mold!

used to examine or remediate mold growth in a wall cavity; actively stripping or peeling wallpaper to remove it; and using fans to dry items.

The primary function of Personal Protective Equipment (PPE) is to avoid inhaling mold and mold spores and to avoid mold contact with the skin or eyes. The following sections discuss the different types of PPE that can be used during remediation activities. Please note that all individuals using certain PPE equipment, such as half-face or full-face respirators, must be trained, must have medical clearance, and must be fit-tested by a trained professional. In addition, the use of respirators must follow a complete respiratory protection program as specified by the Occupational Safety and

Health Administration (OSHA) (see Resources List for more information).

#### Skin and Eye Protection

Gloves are required to protect the skin from contact with mold allergens (and in some cases mold toxins) and from potentially irritating cleaning solutions. Long gloves that extend to the middle of the forearm are recommended. The glove material should

#### Personal Protective Equipment



Photo 7: Remediation worker with limited PPE

be selected based on the type of materials being handled. If you are using a biocide (such as chlorine bleach) or a strong cleaning solution, you should select gloves made from natural rubber, neoprene, nitrile, polyurethane, or PVC. If you are using a mild detergent or plain water, ordinary household rubber gloves may be used.

To protect your eyes, use properly fitted goggles or a full-face respirator with HEPA filter. Goggles must be designed to prevent the entry of dust and small particles. Safety glasses or goggles with open vent holes are not acceptable.

#### **Respiratory Protection**

Respirators protect cleanup workers from inhaling airborne mold, mold spores, and dust.

Minimum: When cleaning up a small area affected by mold, you should use an N-95 respirator. This device covers the nose and mouth, will filter out 95% of the particulates in the air, and is available in most hardware stores.

Limited: Limited PPE includes use of a half-face or full-face air purifying respirator (APR) equipped with a HEPA filter cartridge. These respirators contain both inhalation and exhalation valves that filter the air and ensure that it is free of mold particles. Note that half-face APRs do not provide eye protection. In addition, the HEPA filters do not remove vapors or gases. You should always use respirators approved by the National Institute for Occupational Safety and Health (see Resources List).

Full: In situations in which high levels of airborne dust or mold spores are likely or when intense or long-term exposures are expected (e.g., the cleanup of large areas of contamination), a full-face, powered air purifying respirator (PAPR) is recommended. Full-face PAPRs use a blower to force air through a HEPA filter. The HEPA-filtered air is supplied to a mask that covers the entire face or a hood that covers the entire head. The positive pressure within the hood prevents unfiltered air from entering through penetrations or gaps. Individuals must be trained to use their respirators before they begin remediation. The use of these respirators must be in compliance with OSHA regulations (see Resources List).





The section on <u>what to wear</u> when cleaning moldy areas in the Brief Guide to Mold and Moisture in Your Home recommends wearing an N95 respirator to limit exposure to airborne mold.

# Flood cleanup guidance

illustrated, plain language guidance

**Flood Cleanup** and the Air in **Your Home** Poster

https://www.epa.gov /indoor-air-qualityiag/flood-cleanupand-air-your-homeposter





Flood water can make the air in your home unhealthy.

respirator (Hardware stores usually sell them.) Goggles / Gloves / Long pants, longsleeved shirt, and boots or work shoes

wear

When cleaning

✓ An N-95

**Clean and dry** your house and everything in it.

Clean and dry hard surfaces. Throw away anything that was wet with flood water and can't be cleaned.

# Flood Cleanup and the Air in Your Home

Use portable generators OUTSIDE and far away from the building.





www.epa.gov/iaq/flood

EPA 402-8-07-001 Revised Sept. 2011

## Flood Cleanup and the Air in Your Home Booklet







https://www.epa.gov/mold/floo d-cleanup-and-air-your-homebooklet

## Flood Cleanup and the Air in Your Home Booklet

## When cleaning

- Wear an N-95 respirator.
- Wear goggles.
- Wear gloves so that you don't touch mold with your bare hands.
- Wear long pants, a long-sleeved shirt, and boots or work shoes.





Choose goggles without vent holes, so the mold doesn't get in your eyes.



### Flood Cleanup and the Air in Your Home Booklet

### N-95 respirator



Wear a respirator, an "N-95 respirator," mask over your mouth and nose, so that you do not breathe in a lot of mold. A respirator that protects against mold is called an N-95 respirator.

> Handerchief or Bandana

A dust mask or handkerchief will not protect you because mold can pass through it.



Dust Mask



Hardware stores usually sell N-95 respirators. Only use a respirator that says N-95 on the package.

# Homeowner's and Renter's Guide to Mold Cleanup after Disasters

Developed in 2015 by EPA, Department of Housing and Urban Development (HUD), Federal Emergency Management Agency (FEMA), National Institutes of Health (NIH), and the Centers for Disease Control and Prevention (CDC).

It summarizes basic procedures for mold remediation after flooding and other disasters.

**Key Messages include:** Wear personal protective equipment. Wear an N-95 respirator at a minimum, goggles, and protective gloves.



https://www.epa.gov/mold/homeowners-and-renters-guide-mold-cleanup-after-disasters

# Mold: Worker and Employer Guide to Hazards and Recommended Controls

Developed by EPA, Department of Housing and Urban Development (HUD), National Institutes of Health (NIH), and the Occupational and Safety and Health Administration (OSHA)

This safety and health reference guide summarizes basic procedures for mold remediation for workers involved in home rebuilding and rehabilitation after disasters with an emphasis on worker protection. Recommendations for respiratory protection are included.



MOLD: WORKER AND EMPLOYER GUIDE TO HAZARDS AND RECOMMENDED CONTROLS



https://www.epa.gov/mold/worker-and-employer-guide-hazards-and-recommendedcontrols

# Mold: Worker and Employer Guide to Hazards and Recommended Controls

#### **Personal Protective Equipment (PPE)**

**Respirators:** 

- For areas smaller than 100 ft<sup>2</sup>, use a NIOSH-approved respirator; at a minimum, either a half-face or full-face respirators equipped with N95, R95 or P95 filters.
- For areas greater than 100 ft<sup>2</sup>, areas where mold growth is heavy (blanket versus patchy coverage), or areas where substantial dust is generated during cleaning or debris removal (e.g., abrasives are used to clean surfaces); use a NIOSH-approved, respirator; at a minimum, a half-face air purifying respirator equipped with N100, R100 or P100 filters. A full-face air purifying respirator with similar filters may offer greater protection.
- Charcoal-impregnated filters may be used for nuisance odors.

Non-vented goggles.

Long gloves (e.g., overlapping the sleeves) made of an impermeable material that will protect workers from chemicals used for surface cleaning and skin contact with mold.

Long hard-toe rubber boots.

Protective clothing (e.g., disposable coveralls) to prevent contamination and skin contact with mold and chemicals. For additional protection, especially in areas greater than 100 ft<sup>2</sup>, ensure that protective clothing covers entire body including head and feet

# Wildfires and Indoor Air Quality (IAQ)

https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq

EPA guidance on <u>Wildfires and Indoor Air Quality</u> considers use of N95 respirators among many other protective actions to reduce smoke exposure indoors and references resources on the AirNow website for more specific information on respiratory protection in the context of wildfire smoke.

# How Does Wildfire Smoke Affect Indoor Air Quality?

Outdoor air, including fine particles from wildfire smoke, can enter your home in a few ways:

- through open windows and doors, which is known as **natural ventilation**.
- through mechanical ventilation devices such as bathroom or kitchen fans that vent to the outdoors, or heating, ventilation and air conditioning (HVAC) systems with a fresh air intake.



Ways that outdoor air can enter a home

• through small openings, joints, cracks, and around closed windows and doors through a process called **infiltration**.

Wildfire smoke could impact your indoor air quality (IAQ) differently depending on the proximity of the fire and the density of the smoke. Here are some situations you might experience and the actions you can take in each situation:

# Wildfires and Indoor Air Quality (IAQ)



# Consider purchasing N95 respirator masks

You should also consider keeping a supply of N95 respirator masks on hand. You can often purchase these masks in hardware stores or drugstores. The <u>Protect Your Lungs from Wildfire Smoke</u> <u>or Ash</u> fact sheet and <u>this infographic</u> will help you choose the correct mask and wear it effectively.

# What Can I Do After a Wildfire Smoke Event to Protect My Family from Ash Indoors?

After the smoke clears, you may need to clean up ash or other debris left behind by the fire. The <u>Protect Yourself from Ash</u> fact sheet describes how you can protect yourself and your family and avoid getting ash in the indoor air while cleaning up.

Children, older adults, and people with heart or lung diseases, such as asthma, should not participate in cleanup work. Cleanup work can expose you to ash and other products of the fire that may irritate your eyes, nose, or skin and cause coughing and other health effects.

Wear gloves, long-sleeved shirts, long pants, shoes and socks to avoid skin contact with ash. Wear an N95 respirator to protect your lungs from breathing in ash. Change your shoes and clothing before you leave the cleanup site to avoid tracking ash offsite, into your car, or other places. To avoid tracking ash into clean indoor spaces, use doormats and clean them regularly. Remove shoes indoors when possible.

Ash deposited on surfaces both indoors and outdoors can be inhaled if it becomes airborne when you clean up. Avoid stirring up or sifting through ash as much as you can. Avoid actions that kick ash particles up into the air, such as dry sweeping. Before sweeping indoor and outdoor hard surfaces, mist them with water to keep dust down. Follow with wet mopping. Use a



Illustration of a man wearing appropriate gear to clean up ash after a wildfire