

Protecting Chimney Sweeps from Respiratory Hazards: Respirator Use

Respiratory protection can be used to reduce sweeps exposure to airborne hazards. Knowing which type of respirator is right for the job at hand, and how to properly use it, is crucial to protecting sweeps.

Chimney sweeping activities can expose sweeps and others near the work area to toxic particles and vapors. Dusts can even be taken home in vehicles, equipment, or clothing, exposing others to the potential hazard. As early as the 1700s, scrotal cancer was linked to chimney sweeps' occupational exposure to coal soot.¹ Since then, several studies have shown sweeps have a higher risk of bladder, esophageal, and lung cancer and ischemic heart disease.^{2,3,4,5,6}

Common Airborne Hazards for Chimney Sweeps



Soot: small black particles that can lead to cancer if breathed in, swallowed, or absorbed through the skin.⁷



Organic vapors: vapors produced by [organic solvents](#). Using chemical waterproofing products, repellents, or some cleaning products can produce organic vapors that could be hazardous to inhale. In these situations, a respirator with a chemical cartridge is required.



Silica or silicon dioxide: a mineral sometimes present in a chimney's masonry or mortar. Chimney sweeping or repair can release these particles into the air. Breathing in silica dust can lead to silicosis, an irreversible lung disease.



Bird and bat droppings: droppings that can create fine dust particles when aerosolized. Briefly inhaling highly contaminated dust may cause an infection which can then lead to the development of fungal diseases such as [histoplasmosis](#) and other infectious diseases. Treatment may take three months to a year.

Employer Responsibilities

- Implement [controls](#) such as engineering (e.g., exhaust fans, large vacuums) or administrative (e.g., minimizing exposure time) prior to respiratory protection.
 - Require the use of respirators if other controls are not available, feasible, in working order, or are insufficient at reducing exposure to harmful contaminants.
 - Ensure respirators at work are used within a [respiratory protection program](#) (RPP) as required by the Occupational Safety and Health Administration's (OSHA) respiratory protection standard, [29 CFR 1910.134](#). OSHA's [Small Entity Compliance Guide](#) helps small businesses comply with its respiratory protection standard.
 - Provide sweeps a respirator approved by the National Institute for Occupational Safety and Health (NIOSH). As required by OSHA, respirators should be provided at no cost whenever they are needed to protect sweeps' health.
 - Understand the different respirator types and the level of protection each provides. Respirators used in chimney sweeping may include:
 - Filtering facepiece respirators (FFRs)
 - Elastomeric half mask respirators (EHMRs)
 - Elastomeric full facepiece respirators
 - Powered air-purifying respirators (PAPRs)
- More information see: [Types of Respiratory Protection](#)
- Carefully review [OSHA's Table 1 of Assigned Protection Factors \(APF\)](#) to determine a respirator's appropriate APF. APFs indicate the level of protection a sweep can expect to receive from a respirator when an RPP is in place.
 - Select the correct respirator based on a [hazard assessment](#). This assessment identifies the contaminants present, their concentration and sources, work activity, and other factors including controls in place.
 - Select a respirator with an APF equal to or greater than the exposure determined by the hazard assessment.



Implementing a Respiratory Protection Program

OSHA requires that employers implement an RPP to ensure sweeps receive the expected level of protection from their respirator. Without an RPP, the level of protection provided is unknown. RPPs typically have [nine parts](#) including medical evaluations, fit testing, and training.

Medical Clearance: Before wearing a respirator, sweeps must undergo a medical evaluation to identify any health problems that could occur while wearing one. This evaluation could occur during the hiring process.

Fit Testing: Once medically cleared to wear a respirator, a sweep must complete a [qualitative or quantitative fit test](#). Employers must provide various respirator models and sizes to determine which respirator fits and is acceptable to the sweep. Fit testing should be done before initial use, annually, and any time a sweep uses a different model, style, or size respirator. **Fit testing is only required for tight-fitting respirators.** For information on qualifications to perform fit testing, see the NIOSH [trusted source web page](#).

Training: Employers must train sweeps annually, or when the need arises, on how to properly use, clean, and maintain their respirator. This includes if the type or level of hazard changes or

if sweeps use a new type or model of respirator. OSHA's standard 1910.134 provides requirements for proper use, cleaning and disinfection, and storage of respirators. Manufacturers also often provide this information in their user instructions.

Voluntary Use: Employers may allow sweeps to use respirators when the environment does not require their use. This is called voluntary use. Employers may provide respirators for voluntary use or sweeps may supply their own. Under voluntary use, the employer must make sure the respirator does not present a health hazard to the sweep. OSHA defines voluntary use requirements in [29 CFR 1910.134\(c\)\(2\)](#), [Appendix D](#).

For training videos on these elements and general respiratory protection guidance, see OSHA's [Respiratory Protection web page](#).

Respirator Use Considerations for Sweeps

NIOSH considers proper selection and use of respirators essential for protecting chimney sweeps. The following tips may help sweeps reduce exposures:

- Always wear your respirator correctly for the entire period of exposure. Failure to do so can greatly reduce the protection you receive. Make sure you are in an uncontaminated area when removing or putting on your respirator.
- Always wear at least an N95[®] level FFR when removing clothes or handling tools that are coated in dust, or dumping debris from a vacuum.
- Wear an approved respirator with a chemical cartridge for organic vapors when using chemical solvents. Follow the personal safety recommendations in the chemical safety data sheet for the product.
- Always wear your respirator at the top of a chimney. If you left your respirator elsewhere, go back and get it.
- Understand that holding your breath instead of using a respirator **will not** protect you from hazardous particles, gases, or vapors.
- Make sure you do not have facial hair under the sealing area of a tight-fitting respirator (e.g., FFRs, EHMRs). Some facial hair can grow in or protrude into the sealing surface of the respirator and prevent a good seal. For facial hairstyles that may work with an FFR, see NIOSH's [facial hair infographic](#).
- Consider using a loose-fitting PAPR if your facial hair prevents a good seal as it **does not** require a fit test.
- Make sure to change out your chemical cartridge according to the change schedule your employer puts in place if you use a respirator with a chemical cartridge. Manufacturers provide information on the expected service life of their cartridges and how to store them.
- Properly discard and replace your filter or cartridge, or your entire FFR, when it becomes damaged, soiled, or hard to breathe through.
- Always follow the respirator manufacturer's user instructions.

1 Pott P [1775]. Chirurgical observations relative to the cataract, the polypus of the nose, the cancer of the scrotum, the different kinds of ruptures, and the mortification of the toes and feet. London: Hawes, Clarke & Collins.

2 Gutavsson et al. [1998]. Excess mortality among Swedish chimney sweeps. *Br J Ind Med* 45:777-781.

3 Berglund, M [2017]. Chimney Sweeps' Work Environment A knowledge review. Linköping University.

4 Parent et al. [2000]. Workplace exposures and oesophageal cancer. *Occ Environ Med* 57:325-334.

5 Hansen E [1983]. Mortality from cancer and ischemic heart disease in Danish chimney sweeps: A five-year follow-up. *Am J Epid* 117:160-164.

6 Hogstedt C et al. [2013]. Cancer incidence in a cohort of swedish chimney sweeps, 1958-2006. *AJPH* 103(9):1708-1714.

7 IARC [2012]. IARC monographs on the evaluation of carcinogenic risks to humans. Soot, as found in occupational exposure of chimney sweeps. Vol. 100F. Lyon, France: World Health Organization, International Agency for Research on Cancer.