

Personal Protective Equipment

Personal Protective Equipment – Contamination and Decontamination

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What is contaminated personal protective equipment?

[Personal protective equipment \(PPE\)](#) protects workers from hazards, including [chemical](#) (such as dust, soot, and ash), [biological](#) (such as bodily fluids), and physical (such as noise and radiation) hazards. Personal protective equipment can become contaminated when it comes into direct contact with substances or as a result of handling, use, transportation, or storage practices. For example, [firefighters](#)' bunker gear can become contaminated with products of combustion, such as polycyclic aromatic hydrocarbons (PAHs), petroleum products, or soot from firefighting activities.

Contaminated personal protective equipment must be decontaminated to reduce worker exposures. In some cases, disposal may be required. The risk of exposure does not always end when the task or event is complete. Contaminated personal protective equipment can lead to issues such as cross-contamination if it is not handled, stored, cleaned, or disposed of properly.

While personal protective equipment may become contaminated by a variety of workplace hazards, this document focuses on contamination from chemical hazards.

What are the health and safety concerns related to contaminated personal protective equipment?

- **Off-gassing:** Once personal protective equipment has become contaminated, it can release harmful chemicals back into the air, a process known as “off-gassing.” Contaminated personal protective equipment can continue to off-gas and release contaminants, which can extend the period of a worker’s exposure.
- **Cross-contamination:** Contaminants on personal protective equipment can spread to spaces in the workplace intended to be clean and free of contaminants, such as lunchrooms, sleeping quarters, or vehicles. Contaminants can also be transported into a worker’s personal environment, such as their vehicle or home.
- **Airborne exposure:** Handling contaminated personal protective equipment can disturb settled contaminants and result in airborne exposures, increasing the risk of inhalation. For example, putting on or removing contaminated bunker gear can expose firefighters to harmful chemicals.
- **Dermal (skin) exposure:** Contaminants on personal protective equipment can transfer to the skin during cleaning or handling.
- **Ingestion exposure:** Contaminated personal protective equipment can result in unintentional ingestion of harmful chemicals. Exposures can happen when eating, drinking, or smoking without proper hygiene.
- **Unsafe personal protective equipment practices:** Normalizing dirty personal protective equipment as a sign of experience or toughness can create a false sense of protection and reduce proper cleaning and safety practices.

What are good practices for decontaminating personal protective equipment?

Decontamination measures should be tailored to an organization and be specific to the personal protective equipment and the contaminants present. Employers should have a [policy](#) and procedure for decontamination methods. Decontamination measures can include the following:

- Perform decontamination in designated areas away from clean zones and unprotected workers to prevent cross-contamination.
- Ensure decontamination measures will not create a new hazard, such as a slipping hazard.
- Instruct and train workers on decontamination procedures.
- Follow the manufacturer's decontamination instructions to make sure that the decontamination measures are effective and do not degrade the material.

- Ensure professional cleaning services are performed when personal protective equipment has been contaminated with hazardous materials, such as [asbestos](#) or [lead](#).
- Do not perform decontamination in homes, personal vehicles, public laundry facilities, or living quarters.

When should personal protective equipment be disposed of rather than decontaminated?

Personal protective equipment should be inspected before, during, and after decontamination. Personal protective equipment may need to be disposed of and replaced when it:

- shows signs of damage or deterioration,
- fails to meet manufacturer specifications or expiration dates,
- no longer fits properly or functions as intended, or
- has been involved in an incident where its effectiveness may be compromised due to the damage sustained.

Check with the local municipality or the [government department responsible for the environment](#) when disposing of contaminated personal protective equipment.

What general precautions can workplaces take to reduce the risk from contaminated personal protective equipment?

Engineering controls:

- Provide a [ventilated](#) laundry room that is kept under slight negative pressure if laundering is required.
- Install self-closing, properly sealed doors in areas such as living quarters, laundry rooms, and offices to avoid the spread of contaminants.
- Separate the workplace into “hazard zones” to prevent harmful chemicals from travelling within the facility:
 - Red or hot zones: where contaminated equipment is decontaminated.
 - Yellow or warm zones: where cleaned equipment is stored.
 - Green or cold zones: where contaminated equipment is not allowed, such as kitchens, bathrooms, and living quarters.

Administrative controls:

General

- Perform a [hazard identification](#) and [risk assessment](#) for decontamination activities.
- Establish written policies and procedures that detail decontamination requirements.
- Develop and implement a process for laundering and drying personal protective equipment.
- Provide equipment and facilities required for decontamination, such as sinks, designated areas, and [cleaning supplies](#).
- Provide workers with instruction and training on decontamination measures and the health risks associated with contaminated personal protective equipment.

Handling and transporting practices

- Use the air recirculation function if transporting contaminated personal protective equipment inside vehicles.
- Bag and seal contaminated personal protective equipment before transporting it.
- Keep contaminated personal protective equipment separate from workers in the vehicle (for example, transport it in the trunk of the vehicle, away from the driver).
- Do not transport contaminated personal protective equipment in personal vehicles.
- Clean the interior and exterior of vehicles after transporting contaminated personal protective equipment.
- Provide personal protective equipment, such as gloves, [respiratory protection](#), and long sleeves, when handling and transporting contaminated items.

Laundering practices

- Wash regular laundry separately from contaminated personal protective equipment.
- Keep laundry areas, if available, away from storage areas intended for clean personal protective equipment.
- Make sure workers have clean clothing to wear after performing decontamination.
- Have dedicated storage areas for clean equipment.

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Personal hygiene

- Promote proper [hand hygiene](#).
- Provide facilities for workers to shower.

Personal protective equipment:

- Provide appropriate personal protective equipment, such as [safety_glasses](#), an apron, gloves, and long sleeves, when cleaning contaminated personal protective equipment. If there is potential for exposure to airborne contaminants, a respirator may be required.

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