



PSEP Fact Sheet: Inspecting, Maintaining, and Replacing Pesticide Application Equipment and Personal Protective Equipment

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Clothing and devices that protect the body from pesticides are called personal protective equipment (PPE). All PPE either should be disposable or easy to clean and sturdy enough for repeated use. To remain protective, PPE must be maintained carefully and replaced as necessary.

Disposables

Disposable PPE items are not designed to be cleaned and reused. Discard them when they become contaminated with pesticides.

Chemical-resistant gloves, footwear, and aprons labeled as disposable are designed to be worn for a limited time and then thrown away. These items often are made of thin vinyl, latex, or polyethylene. Inexpensive disposables may be a good choice for brief tasks requiring flexibility and when doing tasks that will not tear the thin material.

Non-woven (including coated non-woven) coveralls and hoods usually are designed to be disposed of after use. Most are intended to be worn for only one workday's exposure period. The instructions for some coated non-woven suits and hoods may permit them to be worn more than once if each period of use is short, and they do not get much pesticide on them. Be alert when reusing non-woven items, and change them if pesticides are getting through or if the inside surface is contaminated.

Prefilters, canisters, cartridges, and some respirators are disposables. They cannot be cleaned and reused.

Reusables

Some PPE is designed to be cleaned and reused. However, do not reuse items that can no longer provide protection.

Rubber and plastic suits, gloves, boots, aprons, and headgear often are designed to be cleaned and reused, but even these should be replaced often. Wash them thoroughly between uses. Before putting them on, inspect reused items carefully for signs of wear or abrasion. If they show any sign of wear, throw them away. Even tiny holes or thin places can allow large amounts of pesticide to move to the inside surface and get on the skin. Check for rips and leaks during cleaning by using the rinse water to form a "balloon" or by holding the items up to the light.



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Even if there are no signs of wear, replace reusable chemical-resistant items regularly. Residues that cannot be detected may remain in the material even after washing and adequate airing and may build to a harmful level.

Follow manufacturer's instructions, if any, for replacement. A good rule of thumb is to dispose of gloves that have been worn for about one week of work. Extra heavy-duty gloves, such as those made of butyl or nitrile rubber, may last as long as two weeks. Because hand protection is the most important concern for pesticide handlers, glove replacement is a high priority. Footwear, aprons, headgear, and protective suits may last longer than gloves because they generally receive less exposure to the pesticide and less abrasion from rough surfaces. However, they should be replaced regularly and at any sign of wear.

Fabric coveralls are designed to be cleaned after each day's use and reused. However, absorbent materials such as cotton, polyester, cotton blends, denim, and canvas cannot be cleaned adequately after they are drenched or thoroughly contaminated with a concentrated pesticide labeled with the signal word **Danger** or **Warning**. Always discard any such clothing or footwear as they cannot be safely reused.

Most protective eyewear and respirator face pieces are designed to be cleaned and re-used. These items may last many years if they are good quality and are maintained correctly.

Maintaining PPE

At the end of an activity involving exposure to pesticides, remove PPE right away. Wash the outside of the gloves with detergent and water before removing them. Consider washing the outside of other chemical-resistant items before removing them also. This helps avoid contact with the contaminated part of the items and helps keep the inside surface uncontaminated. If any other clothes have pesticide on them, change them. Determine whether the items should be disposed of or cleaned for reuse.

Place reusable items in a labeled plastic bag or hamper away from other personal clothes and away from family laundry. Place disposables in a separate plastic bag or container. The pesticide remaining on PPE, work clothing, and other work items could injure

people or pets that touch them. Do not allow contaminated PPE to be washed in streams, ponds, or other bodies of water. The pesticide could poison aquatic life or harm people, livestock, and wildlife.

Clean reusable PPE items between uses. Even if they were worn for only a brief period of exposure, wash them before wearing them again. Pesticide residues that remain on the PPE are likely to continue to move slowly through the PPE material, even chemical-resistant material. If the PPE is worn again, pesticide may already be on the inside. Also, PPE worn several times without laundering may build up pesticide residues. Even when the pesticides are not highly toxic, the residues can reach a harmful level.

Maintaining Eyewear and Respirators

Hand-wash goggles, face shields, shielded safety glasses, and reusable respirator face pieces after each use. Follow manufacturer's instructions, if available, or use mild detergent and warm water to wash them thoroughly. Rinse thoroughly and wipe dry or hang in a clean area to air dry.

Store respirators and eyewear where they are protected from dust, sunlight, extreme temperatures, excessive moisture, pesticides, and other chemicals. A sturdy zip-lock plastic bag works well for storage.

Respirator maintenance is especially important. Inspect respirators before each use and repair or replace them if any part shows signs of wear or deterioration. Keep an inventory of replacement parts. Use only those supplied by the original manufacturer and listed on the NIOSH approval label. Respirators kept for standby or emergency use should be inspected at least monthly and before use.

If it is necessary to remove the respirator between tasks:

- Handle it only with clean hands.
- Wipe the face piece with a clean cloth.
- Replace caps, if available, over cartridges, canisters, and pre-filters.

Seal the entire respirator in a sturdy, air-tight container, such as a zip-lock plastic bag. If the respirator is not sealed immediately after each use, the disposable

parts must be replaced more often. Cartridges, canisters, pre-filters, and filters collect impurities as long as they are exposed to the air.

At the end of any work day when a reusable respirator face piece was worn:

- Remove and discard any pre-filters.
- If removable, take off the cartridges or canisters. If they are still usable, replace the caps and seal in an airtight container, such as a zip-lock plastic bag. Discard them if they cannot be reused.
- Clean and store the respirator as directed above.

Washing PPE

Do not allow used PPE to be washed with the regular family laundry. It could cause the other items to be dangerously contaminated.

Alert the person who does the washing

Be sure the people who clean and maintain PPE and other work clothes know they can be harmed by touching contaminated items. Tell them that they should:

- Wash their hands after touching contaminated items
- Work in a well-ventilated area, if possible
- Avoid inhaling steam from the washer or dryer

Washing procedure

Follow the manufacturer's instructions for cleaning chemical-resistant items. If the instructions say only to wash the item, or if there are no cleaning instructions, follow the procedure described here. Some chemical-resistant items that are not flat, such as gloves, footwear, and coveralls, must be washed twice - once to clean the outside and a second time after turning the item inside out.

Some chemical-resistant items, such as heavy-duty boots and rigid hats or helmets, can be washed by hand using hot water and heavy-duty liquid detergent. Dry and air them as directed below.

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This is the best procedure for washing non-chemical-resistant items such as cotton, cotton/ polyester, denim, canvas, and other absorbent materials, as well as most chemical-resistant items:

- Rinse in a washing machine or by hand.
- Wash only a few items at a time to allow plenty of agitation and water for dilution. Use the highest water level setting.
- Wash in a washing machine, using a heavy-duty detergent and hot water for the wash cycle.
- Rinse twice, using two rinse cycles and warm water.
- Use two entire machine cycles to wash items that are moderately to heavily contaminated.
- Run the washer through at least one additional entire cycle without clothing, using detergent and hot water, to clean the machine. Do this after washing each batch of pesticide-contaminated items and before any other laundry is washed.

Drying procedure

Hang the items to dry, if possible. Letting them hang for at least 24 hours in an area with plenty of fresh air - preferably outdoors - is a good idea. This will permit remaining pesticide residues to move to the surface and evaporate. It is good to have at least two sets of equipment so one set can air in a clean place while the other is in use. Do not hang items in enclosed living areas because pesticides that remain in the clothing may evaporate and expose people or animals.

If it is not possible to hang them to dry, using a clothes dryer is acceptable for fabric items. Over a period of time, however, the dryer may become contaminated with pesticide residues.

This bulletin was adapted from a publication produced by the Environmental Protection Agency and the Extension Service, U.S. Department of Agriculture. *Personal Protective Equipment Guide, Inspecting, Maintaining, and Replacing PPE.*