



Washing Respirators in Buckets or Sinks

First, determine the volume of each sink or bucket in gallons. How to do this is listed at the end.

Water temperature does not affect the cleaning performance of **D-Lead® Respirator and Laundry Detergent** or **D-Bact™ Industrial Disinfectant**. However, OSHA 1910.134, Appendix B-2 states: “Wash components in warm (43 °C [110 °F] maximum) water...” and “Rinse components thoroughly in clean, warm (43 °C [110 °F] maximum) water...” this standard also specifies “Disinfection.” “Sanitizing” is not permissible¹.

First remove the filters and any other parts of the respirator that are not water washable. Filter cartridges can be cleaned quickly with **D-Wipe® Towels** or **D-Lead® Surface Wipes**, <https://esca-tech.com/product/d-lead-surface-wipes/> or alternately vacuumed with the central vacuum or a portable HEPA vacuum. To reduce the possibility of cross contamination, filters should be bagged separately from the cleaned mask for return to the user. Filter cartridges should be wiped down with a **D-Wipe® Towel** <https://esca-tech.com/product/d-wipe-towels/>

Your starting point for Respirator cleaning will be 2 ounces of **D-Lead® Respirator and Laundry Detergent (3235ES)** <https://esca-tech.com/product/d-lead-respirator-laundry-detergent/> per gallon of water (15 mL per liter). We suggest you mark the water level in the container or sink compartment and standardize it. It is expected that you can do 20 to 25 full face respirators with one fill, depending on how dirty they are on any given day.

You may need to adjust the quantity of cleaner up or down and / or the number of respirators washed per dump-fill cycles depending on the results. Respirators can also be scrubbed with a stiff bristle (not wire) brush. Respirators also need to be rinsed after cleaning and prior to sanitizing. This is done with clean, preferably warm water.

Note: For extremely dirty respirators or if you are washing in very hard water, you may wish to use **D-Lead® Extra Strength Laundry Detergent (3236ES)** <https://esca-tech.com/product/d-lead-extra-strength-laundry-detergent/>.

Disinfection:

D-Bact™ Industrial Disinfectant (7102ES) <https://esca-tech.com/product/d-bact-industrial/> is an EPA registered disinfectant and sanitizer (10324-81-74928) specifically approved by the US EPA for disinfecting or sanitizing Personal Protective equipment, including respiratory protection equipment. To clean and disinfect use 0.78 ounces per gallon of water (6 mL per liter). Follow the label directions and assure the respirator remains wetted with disinfectant solution for 10 minutes.

One batch of diluted disinfectant solution can be used for up to 24 hours. You should maintain a user log on the disinfecting step to keep this straight between shifts. The respirators must remain wet for 10 minutes in order to disinfect, but they don't have to soak. You can reduce your Disinfectant usage by lowering the fill level by implementing a procedure of dunking so that every surface is completely wetted and then after 10 to a maximum of 15 minutes, rinse thoroughly with clean water, preferably warm water in a separate sink or bucket.

Alternately, the disinfectant can be applied with a sprayer from a distance of 6 – 8 inches.

¹ Disinfection is reduction of micro-organism count by 10,000 to 1. Sanitation is a reduction of micro-organism count by 1,000 to 1.



Here is the specific text approved by the USEPA as part of the product registration and approval of **D-Bact™ Industrial Disinfectant** <https://esca-tech.com/product/d-bact-industrial/> for use on Personal Protective Equipment:

CLEANING AND DISINFECTING HARD, NON-POROUS SURFACES ON PERSONAL PROTECTIVE EQUIPMENT (RESPIRATORS):

Pre-clean equipment, if heavily soiled to ensure proper surface contact. Prepare a use solution by adding 0.78 oz. of this product per gallon of water {450 ppm active}. Gently mix for uniform use solution. Apply use solution to surfaces of the respirator with a sponge, brush, cloth, mop, by immersion, auto scrubber, mechanical spray device, hand pump, coarse pump or trigger spray device. For spray applications, spray 6-8 inches from surface. Do not breathe spray. Rub with brush, cloth, or sponge. Treated surfaces must remain wet for 10 minutes. Remove excess solution from equipment prior to storage. The user must comply with all OSHA regulations for cleaning respiratory protection equipment (29 CFR § 1910.134). Prepare a fresh solution daily or when visibly dirty.

For complete instructions and approvals see product label.

Respirator Drying:

Air drying can result in dust settling on the respirators during the drying time and re-contaminate them. The best way to dry respirators is with filtered air. You can build an inexpensive respirator dryer from a steel storage cabinet with wire mesh shelves. Mount a small exhaust blower on top and install air intake filters on the lower sides. Heat can be provided by infrared lamps or a small electric heater.

Really Dirty Respirators:

We have had success with this procedure. When a respirator comes to the laundry really dirty, it is bagged instead of washed. The operator is issued a new respirator the next day and the dirty mask is handed to their supervisor for discussion with the worker. When it comes back it is then washed and re-issued.

Testing:

A convenient method for testing the cleanliness of respirators is to use the **D-Lead® Test Kit**. See <https://esca-tech.com/product/d-lead-test-kits-for-lead-dust/>. Typically, one respirator is tested at random per batch after it is clean and dry. The **D-Lead® Test Kit** will give a visible yellow color on the test pad if 20 micrograms or more of lead is recovered from the mask. If the dry respirator tests high, you can use the test to determine if the contamination was the result of improper washing, or dust deposition during or after drying. After testing the respirator should be washed, but at a minimum, rinsed or wiped down with a **D-Wipe® Towel** before it is issued.

1. Spray a test pad with solution 1.
2. Wipe the entire respirator inside and out.
3. Spray the test pad with solution 2. If any lead is present on the wipe, it will immediately turn yellow. The intensity of the yellow color is proportional to the amount of lead present.
4. The detection limit is 20 micrograms total lead. That is the minimum amount of lead present that the average person can see.
5. Use this as your pass / fail criteria for evaluating the respirator laundry performance and to see if you need to adjust the wash time, scrub effort or concentration of cleaner.



When the respirators are dry, inspect all of the valves, straps, face seal, and replace parts in accordance with manufacturer's recommendations.

Install filters or cartridges.

Place in plastic bags with an individually packaged **D-Wipe® Towel** for use in mid shift clean up.

Notes:

The OSHA Respiratory Protection Standard requires Disinfection of Face Pieces and does not authorize sanitizing. We provide the dilutions for both Sanitizing & Disinfecting with **D-Bact™ Industrial Disinfectant**, since it may be appropriate to only sanitize other PPE (e.g. hard hats).

To Sanitize: Use 0.25 ounces per gallons (2 mL/Liter) and keep treated surfaces wet for 3 minutes.

To Disinfect: Use 0.78 ounces per gallons (6 mL/Liter) and keep treated surfaces wet for 10 minutes.

Determining Sink Volume: For rectangular containers the volume is length x width x water depth in inches/1,728 = cubic feet. For round containers the volume is 3.14 x radius x radius x depth / 1,728. Cubic feet x 7.48 = gallons.

