

Alternate Respiratory Protection for Healthcare and First Responders - Filtering Facepiece and Elastomeric Respirators © 2020

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If have been viewing respirator posts and viewing the pictures there some major issues with respirator use on-line.

REMEMBER: When we fit test, we are verifying a specific manufacture, make, model, style and size of a respirator on a specific face. You only get one chance. A respirator can't protect you if it doesn't fit your face. It's that simple.

Filtering facepiece respirators are tight fitting respirators that filter out particles and do not protect against non-particulate hazards such as gases or vapors. Half-facepiece and Full-face respirators are called elastomeric respirators. They are a tight-fitting, air-purifying respirators with replaceable filters (for particulates) or cartridges or canisters (for gases and vapors).

Filtering Facepiece Respirators other than N95's

The following Filtering Facepiece Respirators can be used. Series N, R and P Filtering Facepiece Respirators have to do with resistance to oil. They will all protect you based on the limits of the filters.

- If no oil particles are present, use any series (N, R, or P)
- If oil particles are present, use **only** R or P series
- Follow the respirator filter manufacturer's service-time-limit recommendations

[N95 - Filters at least 95% of airborne particles. Not resistant to oil.](#)

(N95 Manufacturers Index: [3M](#) [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#))

[Surgical N95 - A NIOSH-approved N95 respirator that has also been cleared by the Food and Drug Administration \(FDA\) as a surgical mask.](#)

[N99 - Filters at least 99% of airborne particles. Not resistant to oil.](#)

[N100 - Filters at least 99.97% of airborne particles. Not resistant to oil.](#)

[R95 - Filters at least 95% of airborne particles. Somewhat resistant to oil.](#)

[P95 - Filters at least 95% of airborne particles. Strongly resistant to oil.](#)

[P99 - Filters at least 99% of airborne particles. Strongly resistant to oil.](#)

[P100 - Filters at least 99.97% of airborne particles. Strongly resistant to oil.](#)

https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html

Fit Testing Protocols available for Filtering Facepiece Respirators

- OSHA: 29 CFR 1910.134 Appendix A – Mandatory
- Qualitative fit testing
- Quantitative fit testing
- OSHA has accepted two Modified Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Respirator Fit Test Protocols. The new protocols go into effect on September 26, 2019.

Qualitative fit testing is a pass/fail test method that uses your sense of taste or smell, or your reaction to an irritant in order to detect leakage into the respirator facepiece. Qualitative fit testing does not measure the actual amount of leakage. Whether the respirator passes or fails the test is based simply on you detecting leakage of the test substance into your facepiece; it's an honor system. There are four qualitative fit test methods accepted by OSHA: 29 CFR 1910.134 Appendix A - Mandatory

- Isoamyl acetate, which smells like bananas;
- Saccharin, which leaves a sweet taste in your mouth;
- Bitrex, which leaves a bitter taste in your mouth; and
- Irritant smoke, which can cause coughing.

For Healthcare and First Responders, I use Bitrex.



Quantitative fit testing uses a machine to measure the actual amount of leakage into the facepiece and does not rely upon your sense of taste, smell, or irritation in order to detect leakage. The respirators used during this type of fit testing will have a probe attached to the facepiece that will be connected to the machine by a hose. There are two major quantitative fit test methods accepted by OSHA:

- Generated aerosol;
- Ambient aerosol;
 - Need to control particulate levels in the fit testing room
- **Can Not Use - Controlled Negative Pressure.**



For cross contamination concern during fit testing please read – My Second and Third Post Decontamination of Qualitative fit testing (QLFT) Equipment.

Cleaning

Generally, Filtering Facepiece Respirators they are disposal. During a Pandemic crisis please follow your Infectious Disease Policy and CDC guidelines for reuse and extended use,

Elastomeric Respirators – Half-Face - Reusable

Half-facepiece, tight-fitting respirators that are made of synthetic or rubber material permitting them to be repeatedly disinfected, cleaned, and reused—Equipped with exchangeable filter cartridges – May have disposable components

- NIOSH-approved
- Assigned the same protection classification (APF) as N95s
- N, R, P - 95% to 100% Filters are available depending on the supply chain



Fit Testing Protocols available for Elastomeric Respirators – Half-Face

- OSHA: 29 CFR 1910.134 Appendix A – Mandatory
- Qualitative fit testing
- Quantitative fit testing
 - OSHA has accepted two Modified Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Respirator Fit Test Protocols. The new protocols go into effect on September 26, 2019.
 - OSHA – REDON, Controlled Negative Pressure

Qualitative fit testing is a pass/fail test method that uses your sense of taste or smell, or your reaction to an irritant in order to detect leakage into the respirator facepiece. Qualitative fit testing does not measure the actual amount of leakage. Whether the respirator passes or fails the test is based simply on you detecting leakage of the test substance into your facepiece; it's an honor system. There are four qualitative fit test methods accepted by OSHA: 29 CFR 1910.134 Appendix A - Mandatory

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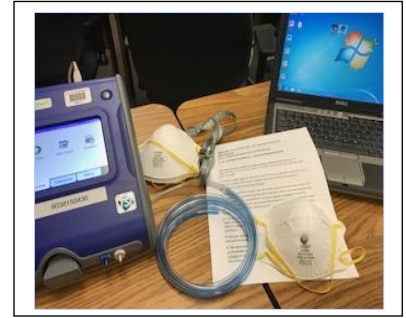
For cross contamination concern during fit testing please read – My First Post Decontamination of Qualitative fit testing (QLFT) Equipment-

Quantitative fit testing uses a machine to measure the actual amount of leakage into the facepiece and does not rely upon your sense of taste, smell, or irritation in order to detect leakage. The respirators used during this type of fit testing will have a probe attached to the facepiece that will be connected to the machine by a hose.

All Fit Testing must be performed while the test subject is standing wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

There are three quantitative fit test methods accepted by OSHA:

- Generated aerosol;
- Ambient aerosol
 - Need to control particulate levels in the fit testing room
 - Uses specific probes and adapters
- Controlled Negative Pressure
 - Uses specific probes and adapters



Selection of Filters for Quantitative Fit Testing

- The isoamyl acetate requires respirators equipped with organic vapor cartridges.
- Both the saccharin and bitrex require respirators equipped with particulate filters (either a 95, 99, or 100 series filter is acceptable).
- To perform the irritant smoke test, the respirator needs to be equipped with either a P100 series particulate filter or HEPA filter.

For cross contamination concern during fit testing please read – My Second and Third Post Decontamination of Qualitative fit testing (QLFT) Equipment.

Elastomeric Respirators – Full-Face- Reusable

Full-face, tight-fitting respirators that are made of synthetic or rubber material permitting them to be repeatedly disinfected, cleaned, and reused–Equipped with exchangeable filter cartridges – May have disposable components

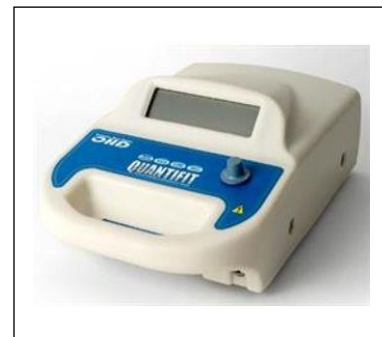
- NIOSH-approved
- Assigned the higher protection classification (APF)
- N, R, P - 95% to 100% Filters are available depending on the supply chain
- Eye and face protection built in



Fit Testing Protocols available for Elastomeric Respirators – Full-Face

- OSHA: 29 CFR 1910.134 Appendix A – Mandatory
- **CAN NOT USE Qualitative fit testing**
- Quantitative fit testing
- OSHA has accepted two Modified Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Respirator Fit Test Protocols. The new protocols go into effect on September 26, 2019.
- OSHA – REDON, Controlled Negative Pressure

Quantitative fit testing uses a machine to measure the actual amount of leakage into the facepiece and does not rely upon your sense of taste, smell, or irritation in order to detect leakage. The respirators used during this type of fit testing will have a probe attached to the facepiece that will be connected to the machine by a hose.



There are three quantitative fit test methods accepted by OSHA:

- Generated aerosol;
- Ambient aerosol
 - Need to control particulate levels in the fit testing room
 - Uses specific probes and adapters
- Controlled Negative Pressure
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For cross contamination concern during fit testing please read – My Second and Third Post Decontamination of Qualitative fit testing (QLFT) Equipment.

Selection of Filters for Quantitative Fit Testing

- The isoamyl acetate requires respirators equipped with organic vapor cartridges.
- Both the saccharin and bitrex require respirators equipped with particulate filters (either a 95, 99, or 100 series filter is acceptable).
- To perform the irritant smoke test, the respirator needs to be equipped with either a P100 series particulate filter or HEPA filter.

When Using Ambient Aerosol (CNC) (TSI-PortaCount) Quantitative fit test methods. You cannot fit test Filtering Facepiece Respirators and Elastomeric Respirators one after the other without modifying the particle count in the room.

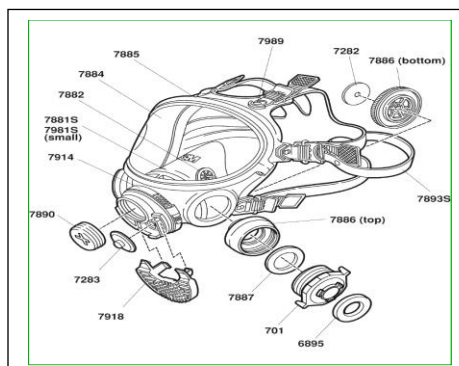
Cleaning - Elastomeric Respirators – Half and Full-Face Respirators

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in **Appendix B- 2**.

Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

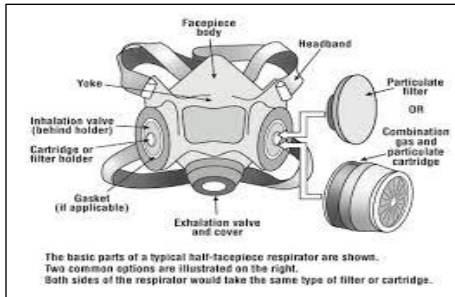


A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F]

maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.



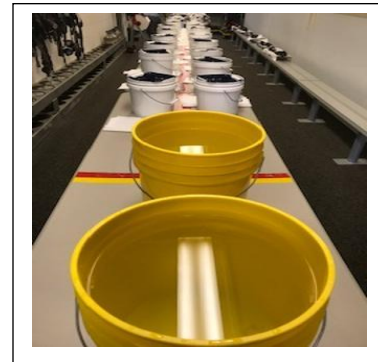
D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

Notice that the cleaning stations are set up utilizing Control Zones and Safety Equipment,



E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

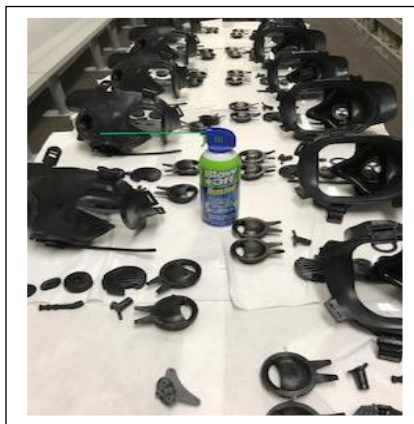


H. Test the respirator to ensure that all components work properly.

Remember OSHA and National Institute for Occupational Safety and Health - also called NIOSH - **requires each respirator manufacturer to include a section in their user instructions that provides the recommended practices for maintenance and care of their respirator.**

Your employer must ensure that the respirator you use is clean, sanitary, and in good working order.

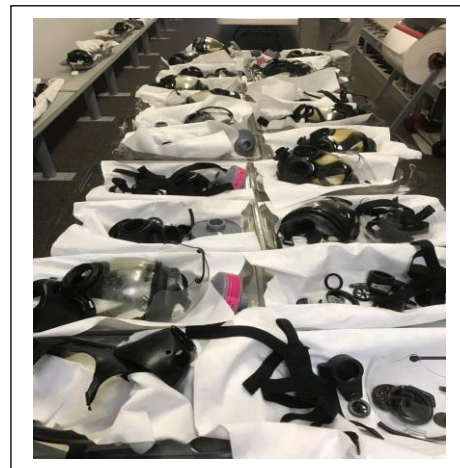
Cleaning and disinfecting must be done using either the procedures in OSHA's Respiratory Protection Standard or the procedures recommended by the respirator manufacturer, provided they are at least as effective as OSHA's.



The manufacturer's procedures should always be checked to see if certain cleaners or disinfectants might damage the respirator and should not be used. If this is the case, the manufacturer's instructions must be followed.

In general, cleaning and disinfecting consists of taking the respirator apart, washing it, disinfecting it, thoroughly rinsing it, and putting it back together when it is dry. Respirators must be cleaned as often as necessary to prevent them from becoming unsanitary. In addition, respirators worn by more than one user must be cleaned and disinfected before being worn by a

different user, and emergency use respirators must be cleaned and disinfected after each use.



Qualifications for Fit Testers

What are the requirements for people who conduct respirator fit testing? Certification is not required. The American National Standards Institute (ANSI), The Occupational Safety and Health Administration (OSHA), EPA and Army Regulations (AR) describe specific qualifications.

Each is slightly different; however, they all require that fit testers are knowledgeable in all aspects of the fit testing process either through training or hands-on demonstration.

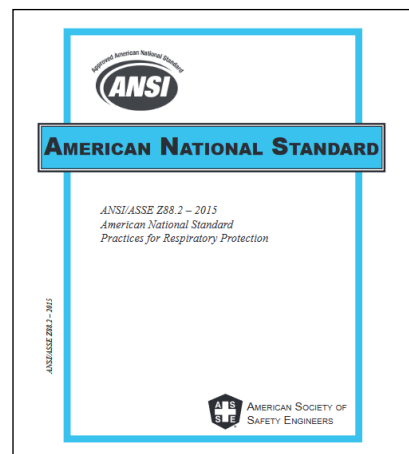
ANSI/AIHA Z88.10-2001 – The standard states that personnel shall be:

properly trained and demonstrate a proficiency in the fit test methods being used.

The respiratory program administrator is responsible for evaluating the qualifications and training of those personnel.

Specific qualifications:

Four Westbrook Corporate Center
Suite 940
Westchester, IL 60154



708.562.0300
fax 708.562.0400
www.irmarisk.org

1. Be familiar with Z88.10 (fit test methods) and Z88.2 (respiratory protection).
2. Demonstrate general knowledge of respiratory face pieces.
3. Demonstrate knowledge of operation & practical aspects of fit test methods.
4. Demonstrate the ability to set up applicable equipment for the fit test method(s) used.
5. Demonstrate the ability to conduct the respirator fit test(s) used.

OSHA 1910.134 Respiratory Protection – Since qualitative and quantitative fit testing procedures are different OSHA has specific requirements for each.

The employer shall ensure that the person performing the testing is able to:

Qualitative Fit Test (QLFT)

1. Prepare test solutions
2. Calibrate equipment
3. Perform tests properly
4. Recognize an invalid test.
5. Ensure equipment is in working order

Quantitative Fit Test (QNFT)

1. Calibrate equipment.
2. Perform tests properly
3. Recognize an invalid test.
4. Calculate fit factors properly.
5. Ensure equipment is in working order.

As of this posting All of the following companies have Quantitative Fit Testing equipment available,

AccuFIT 9000™ - <https://accutec-ihs.com/>

Quantifit - <https://ohdusa.com/products/quantifit/>

TSI - PortaCount® - <https://tsi.com/products/respirator-fit-testers/>