

Filtering Facepiece Respirators FAQ: General Public

Introduction

This is a general document that is not specific to any particular airborne contaminant, including viruses and bacteria.

During public health events – such as wildfires, times of high air pollution, airborne-transmissible disease outbreaks, etc. – members of the public may choose to wear a respirator to help reduce their exposure to airborne particulate hazards. When respiratory protection is recommended for workers and the public, the recommendations often focus on government approved respirators such as "N95, FFP2 or equivalent." When used correctly, respirators can help reduce wearers' exposures to airborne particulate hazards such as dusts, pollen, PM2.5, mists and fumes – including particles so small that they can't be seen. Respirators contain filter material and are designed to form a seal with the wearer's face, so that air passes through the filter (instead of around the edges) before it is inhaled. A common choice is a disposable filtering facepiece respirator (FFR), sometimes referred to as a particulate respirator, such as those shown below.



No matter how well a respirator seals to the face and how efficient the filter media is, wearers should expect a small amount of leakage inside any respirator. No respirators will eliminate exposures entirely. Please read the questions and answers below to give you a better understanding of how respirators work. If you have additional questions about the use of 3M respirators, please consult our website or contact your local 3M office.

The following are generalized responses to some frequently asked questions, to help provide clarity around the following topics:

- 1) [Respirators vs. Masks](#)
- 2) [Types of Respirators](#)
- 3) [How Respirators Work](#)
- 4) [Who Can Use Respirators?](#)
- 5) [How to Use Respirators](#)
- 6) [Comfort Considerations](#)
- 7) [Aesthetic Considerations](#)

8) [Other Questions](#)

It is important to note that guidance from the World Health Organization (WHO), United States Centers for Disease Control and Prevention (CDC), United States Environmental Protection Agency (EPA), or your local health authority should be followed in any health emergency and that this document is not a substitute for that guidance.

Respirators vs. Masks

What should customers look for when selecting a respirator in pollution/health emergencies?

- 1) Check to confirm that the product you are considering is certified as a respirator (such as an N95, FFP2, or KN95). Certified respirators contain filtration material capable of capturing particles, including ones that are too small to see with your eyes.
- 2) Be sure to select a respirator that can seal against your face without any gaps. To provide respiratory protection, a respirator must fit snugly on the user's face to ensure there are no gaps between the face and the respirator seal. Even very small gaps between the face and the edge of the respirator allow air, and particles, to go around the filter media.

Surgical gauze masks, facemasks, or uncertified "dust" masks typically do not have adequate filtration material and may not be designed to form a seal against the face and therefore may not provide the expected protection to your lungs. Note that some uncertified masks look very similar to certified respirators. It is important to carefully read the information printed on packaging before your purchase a product.

For more information: [What is an N95 Respirator?](#)

What is the difference between a certified respirator and a surgical mask?

Respirators are designed to help reduce the wearer's exposure to airborne particles. The primary purpose of a surgical mask is to help prevent biological particles (e.g. bacteria and viruses) from being expelled by the wearer into the environment. Surgical masks are not necessarily designed to seal tightly to the face, so air might leak around the edges.

Many surgical masks are also designed to be fluid-resistant to splash and splatter of blood and other bodily fluids.

Some approved respirators are designed to have the characteristics of both a respirator and a surgical mask. These products are often called "healthcare or medical respirators." In the U.S., surgical N95 respirators are both approved by NIOSH and cleared by the U.S. Food and Drug Administration (FDA) for use in surgery. In other countries, these products are often approved by two equivalent or similar agencies.

For more information: [Respirators and Surgical Masks — A Contrast](#)

Types of Respirators

Do I need a surgical respirator?

Surgical respirators are typically designed to be fluid-resistant to splash and splatter of blood and other bodily fluids. They are intended to be worn by healthcare professionals during procedures which might generate a high-pressure stream of liquid such as arterial spray during surgery.

In general, members of the public would not expect to be exposed to high-pressure streams of infectious liquid. Liquid-droplet aerosols, such as those generated by coughs and sneezes, are capturable by the particulate filter in certified filtering facepiece respirators (FFRs).

Therefore, in nearly all scenarios in which a member of the general public might desire to wear a respirator, a non-medical FFR should be acceptable, and a surgical respirator not necessary.

For more information, see [3M Technical Bulletin - Surgical vs. Standard N95 - Which to Consider?](#)

What is the difference between different countries' respirator approvals? (N95 vs. FFP2 vs. KN95, etc.)

Regulatory standards often dictate the physical and performance properties that respirator products are required to have in order to obtain certification or approval in a particular country. Standards in different countries or regions may have slightly different requirements for certification or approval of respirators.

Most regulatory standards for FFRs have similar, but not identical, test methods and respirator classes. The most commonly used respirator class descriptor is filtration efficiency. This is the ability of a respirator to filter a specific particle in a controlled laboratory test. Because of similarities in standard requirements, the following respirator classes, from various countries and regions, all have approximately 94-95% filtration efficiency, are designed to form a seal with the face, and may be considered to be functionally similar for most uses against non-oil airborne particles:

- Australia/New Zealand - P2
- Brazil - FFP2
- China - KN95, KP95
- Europe - FFP2
- Japan - DS2, DL2
- India - BIS P2
- Korea - 1st class
- US NIOSH - N95, R95, P95

Note that in some countries, there are different respirator performance standards for occupational-use respirators and public-use respirators. Always consult with your local authorities to see what respirators are approved in your country and what is recommended to help reduce your exposure to the airborne hazard of concern.

For more information: [Comparison of FFP2, KN95, and N95 Filtering Facepiece Respirator Classes](#)

How Respirators Work

Can a respirator help protect against very small particles like PM2.5, smoke, soot, bacteria and viruses?

A certified FFR is one way to help reduce exposure to fine particles like PM2.5, smoke, soot, bacteria and viruses. However, local recommendations (such as from a local health agency) should be consulted and followed. Often, such guidance indicates exposure should be avoided by staying away from the source of the hazard - such as staying indoors, away from outdoor air pollution, and avoiding sick people - before relying on respiratory protection.

For more information, view the video [Filtering of Bioaerosols by Filtering Facepiece Respirators](#).

Can a surgical mask, microfiber cloth or wet handkerchief help protect against small particles?

Surgical/procedure or "medical" facemasks are designed to help keep spit and mucous generated by the wearer from reaching a patient or medical equipment. They likely do not provide respiratory protection unless they are designed, tested, and certified as a respirator. To better understand the difference between respirators and surgical masks, [click here](#).

Microfiber cloths, scarves, wet handkerchiefs or similar items have not been designed or tested to help filter out small particles and therefore should not be used for protection of wearers from particulate matter.

Do valves on respirators impact their effectiveness?

The purpose of a respirator's exhalation valve is to reduce the breathing resistance during exhale; it does not impact a respirator's ability to provide respiratory protection. The valve is designed to open during exhalation to allow exhaled air to exit the respirator and then close tightly during inhalation, so inhaled air is not permitted to enter the respirator through the valve.

While a valve does not change a respirator's ability to help reduce a wearer's exposure to bioaerosols, a person who is exhibiting symptoms of illness should not wear a valved respirator, because exhaled particles may leave the respirator via the valve and enter the surrounding environment, potentially exposing other people.

Will FFRs remove odors from wildfires, air pollution, etc.?

Particulate FFRs will filter out particles such as dust, soot, ash and PM2.5. Odors are not a particle, they are considered a gas or vapor. Some FFRs are available with a carbon layer that will provide relief against low levels of odors (also called "nuisance" odors). For higher concentration levels of gases and vapors or for areas with low oxygen, different types of respirators should be used. Contact your local health authority and hire a professional to deal with these types of situations, as they can be very dangerous.

Does 95% efficient mean that 5% of the particles get through the filter?

All respirators are designed to help reduce, not eliminate, exposures to airborne hazards. For example, N95-rated FFRs have a filtration efficiency of at least 95% against non-oily particles when tested using the NIOSH criteria. The particles used to test the filtration are in a size range that are considered the most penetrating.

It's important to remember that the filter efficiency alone does not determine the overall reduction in airborne hazards provided by a respirator. There are two other key determinants in reducing exposure: fit and wear time, both of which are addressed in the How to Use Respirators section of this document.

Can a respirator with a valve be effective against bioaerosols?

The purpose of a respirator's exhalation valve is to reduce the breathing resistance during exhalation; it does not impact a respirator's ability to provide respiratory protection. The valve is designed to open during exhalation to allow exhaled air to exit the respirator and then close tightly during inhalation, so inhaled air is not permitted to enter the respirator through the valve opening.

While a valve does not change a respirator's ability to help reduce a wearer's exposure to bioaerosols, it is not recommended that a person who is exhibiting symptoms of illness wear a valved respirator, because there is a possibility that exhaled particles may leave the respirator via the valve opening and enter the surrounding environment, potentially spreading the disease.

Can the valve on a respirator result in the release of particles containing germs if the wearer is infected with a disease that spreads through the air?

Currently 3M is not aware of any studies on whether airborne germs exit a respirator through the exhalation valve. To date, no guidance has been issued by the CDC, WHO, or NIOSH on this issue.

Government-certified/approved respirators such as N95, FFP2, KN95, and [similar](#) are designed to help reduce the wearer's exposure to airborne contaminants.

Typically, particles expelled by people that may contain viruses are relatively large aerosols, such as airborne droplets. In addition, the breathing rate of people during normal or sedentary work is relatively low. As a result, the valve on a filtering

facepiece respirator would not be expected to open very far during exhalation, which would create only a limited path for the relatively large aerosols expelled by the wearer to navigate. Particle physics predicts that most of the wearer-generated aerosols would impact on the back of the valve instead of exiting out through the valve opening.

Since there have been no published studies on this, it cannot be definitively said that no virus-containing aerosols expelled by a wearer would exit the respirator through the exhalation valve.

Note that surgical masks, procedural masks and face coverings – which are often worn to control the spread of infectious diseases – are not designed to fit tightly to the face and have gaps around the face through which air will leak both inward when the wearer inhales and outward when the wearer exhales, potentially including expelled particles.

Should tape be placed over the exhalation valve of respirators to help protect the surrounding environment from exhaled air?

Taping over or otherwise covering a respirator valve voids the regulatory approval and may impact how the respirator functions. 3M does not recommend altering respirators that are worn for the purpose of reducing wearer exposure to airborne hazards.

3M respirators are intended to help protect the wearer. They do this by helping reduce the wearer's exposure to airborne contaminants. When properly selected and worn, 3M respirators are safe and effective for this use. This includes 3M respirators with valves.

Exhalation valves help reduce breathing resistance when the wearer exhales (breathes out). Those valves open only when the wearer exhales, helping air exit the respirator. Currently 3M is not aware of any studies on the risk of infectious material exiting through the exhalation valve of respirators.

Other face coverings, such as homemade masks and procedure masks, are not designed to fit tightly to the face and have gaps around the face through which air will leak, both inward when the wearer inhales and outward when the wearer exhales, potentially including expelled particles. Air and particles will also travel through the mask material at different rates depending on its construction.

Can respirators without fluid resistance testing help protect against sneezes and coughs?

Filtering facepiece respirators do help protect against liquid droplets that are generated due to sneeze and cough. When such droplets strike the surface of a respirator, they will be captured.

Fluid resistance testing for surgical respirators involve a high-pressure jet of liquid sprayed directly at the respirator. A droplet from a sneeze or cough does not have nearly the same momentum as a jet of liquid.

Who Can Use Respirators?

Can older adults or individuals who have medical conditions wear a respirator?

Anyone considering wearing a respirator who has concerns about any previously existing health conditions or injuries should consult a health care provider prior to use.

Can children wear respirators?

In many countries, respirators are not currently approved by certification agencies for children's use for general emergencies, such as disease outbreaks and poor air quality. As a result, 3M does not make respirators available specifically for children in most countries. Unless marked clearly otherwise, currently available 3M respirators are designed to fit adults, tested on adults, certified for use by adults, and have user instructions written for adults. Even though some of our adult respirators may fit

certain children, guidance should be followed from local health authorities on how to help protect children during disease outbreaks and air quality alerts.

IMPORTANT: Infants and toddlers should never be given respirators due to the risk of choking and suffocation.

What are some considerations to be aware of related to respiratory protection for children?

If a parent decides to provide a respirator to a child (such as when directed to do so by health authorities), the parent must understand that he/she will be willingly accepting several risks for their child, including but not limited to the following considerations:

- A respirator must form a good seal to the face to be effective, and children's faces may be too small to obtain a good seal on respirators that were designed for adults' faces. Every child's face is unique, and some children might have faces that are as large as some adults' faces.
- It is possible that some children will not be mature enough to use a respirator correctly.
- Infants and toddlers should never be given respirators due to the risk of choking and suffocation.
- All respirators have certain performance features and use requirements, and it is very important that all instructions are read and understood before providing a respirator to anyone.
- It is important to realize that misuse of a respirator may result in sickness or death.

Will a filtering facepiece respirator still work if I'm not fit tested?

Possibly. When worn correctly, government-certified respirators, such as N95 respirators, can help reduce the number of airborne particles you breathe. Fit testing is required in some countries and considered a best practice. If you do not receive formal training or a fit test (as a medical or industrial worker typically would), you may not receive the full benefit of the respirator. However, studies have shown that people can still receive a reduction in exposure if they do the following¹:

- Follow the instructions on how to put on the respirator (i.e., donning)
- Perform the user seal check (fit check) described in the user instructions
- Make sure that they are clean-shaven where the respirator touches the face
- Make sure no clothing or jewelry gets between the respirator and the face

It is important to remember that respirators cannot eliminate the breathing in of all particles in the air and cannot eliminate the possibility of becoming sick. Standards regulating respirator training for the general public have not been established. For your respirator to help reduce the number of particles you breathe, you must read and follow the user instructions that come with the respirator.

How to Use Respirators

What should I do to become familiar with respirators and how to use them?

It's important to familiarize yourself with the respirator user instructions and to practice putting on the respirator in a clean area before you begin using it in a contaminated area. Consult the resources that manufacturer or health authorities may provide to help you put the respirator on correctly (e.g. videos, infographics, etc.)

For more information, see [3M Technical Bulletin - 2019 Novel Coronavirus Outbreak: Guidance for Individuals Regarding the Use of Disposable Filtering Facepiece Particulate Respirators](#)

1. Brian Rembialkowski, Margaret Sietsema & Lisa Brosseau (2017) Impact of time and assisted donning on respirator fit, Journal of Occupational and Environmental Hygiene, 14:9, 669-673.

How important is the fit of the respirator?

It is very important that your respirator be able to seal completely to your face. Your respirator should be well-sized for your face, so no gaps or leaks are detectable around the edge of the respirator. If a respirator does not seal well to your face, airborne hazards can enter around the gaps between the faceseal and the face. If you cannot achieve a good seal with your respirator, you should try a different model until you find one that is well sized and seals well to your face. The respirator should not be so large that it is very close to your eyes or impacting your vision.

It is very important to always follow the user instructions and do a user seal check (fit check) before entering a contaminated environment. Remember, the better the seal, the more of the air you breathe goes through the filter.

Your face should be cleanshaven in the area where the respirator seals to your skin. Beards, long mustaches, and stubble may cause leaks into the respirator.

How do I put on the respirator and check for an effective seal?

The user instructions for 3M respirators contain the model-specific procedures for putting on the respirator and checking for fit and seal. It is very important to read and follow the donning instructions carefully and to conduct a user seal check (or fit check) every time the respirator is put on. The instructions are provided with the original packaging of the respirator.

Can FFRs be washed?

No. Under no circumstances should an attempt be made to clean or wash a 3M filtering facepiece (particulate) respirator. 3M has investigated methods for healthcare facilities to decontaminate FFRs, however these methods are not approved for use by the general public. Cleaning FFRs voids the NIOSH approval.

Can filtering facepiece respirators be re-used?

FFRs are disposable, but not single use, so they can be used many times. If you suspect your FFR is contaminated with bioaerosols, care should be taken when handling the respirator. During use, particles containing viruses, bacteria, etc. get captured on the filter fibers and remain on the fibers. Therefore, after use, handling or storing the respirator might result in further spreading the disease.

Is there a time limitation for wearing an FFR?

There is no time limit to wearing an FFR. Respirators can be worn until they are dirty, damaged or difficult to breathe through. To be effective, a respirator needs to be worn correctly and worn throughout the duration of the hazardous exposure. People using a respirator will need to go to an area with safe air to remove the respirator for any reason, including to eat and drink. Again, however, users should follow guidance from health authorities, which typically stresses the importance of avoiding prolonged exposure to hazardous air, such as by remaining indoors in clean environments when it is possible to do so.

For more information about air quality in the U.S. and other exposure definitions, visit: [AirNow.gov](https://www.airnow.gov)

Can FFRs be shared?

No. Disposable FFRs should never be shared, due to hygiene considerations.

How should I store my respirator before use?

FFRs are carefully designed to both filter particles and seal to the face. To help protect the condition of respirators so they can function correctly, it's important to store them according to the specified storage requirements.

Until they are needed for use, respirators must be stored:

- In the original packaging
- In a hazard-free environment (clean air)
- Away from direct sunlight
- In a climate-controlled area, with humidity and temperature within the acceptable range specified on the packaging

This means that respirators should be stored indoors, in their original packaging, in a structured storage space where they can't become crushed or distorted. If a respirator will be stored between multiple uses, it should be stored similarly to a new FFR but should be placed in a breathable bag.

Do filtering facepiece respirators have a shelf life?

Yes, many filtering facepieces do have shelf lives. The shelf life and storage information is usually found on the side or bottom of the package. Shelf life is usually shown as a "use by" or "use before" date. Please refer to the respirator packaging, as shelf life is specific to each model.

For additional considerations in understanding shelf lives, these 3M resources may be helpful:

- [3M Blog Post: Why Do Disposable Respirators Have a Defined Shelf Life?](#)
- [3M Filtering Facepiece/Disposable Respirator Storage Conditions and Shelf Life - FAQs](#)

Should the respirator be disposed of after the shelf life has expired?

3M's recommendation is that the respirator be disposed of after the stated use by date has expired.

Comfort Considerations

I'm looking for a comfortable respirator – what should I know?

Many FFR models include a variety of comfort features, such as exhalation valves, nose foam, and small-sized options. You might take note of listed comfort features, in addition to whether a product holds a certification from an approval authority.

It may also be helpful to note that reusable elastomeric respirators offer a different wearer experience from FFRs, for those applications where an exhalation valve is appropriate. The sealing surfaces of elastomeric facepieces are rubber or silicone instead of the nonwoven materials that line the insides of FFRs. Due to the nature of elastomeric respirator design, exhaled air exits the facepiece through an exhalation valve opening, rather than through the filter material, as it does with unvalved FFRs. Some wearers may prefer this experience.

Aesthetic Considerations

I'm looking for a stylish respirator – what should I know?

It is important to be aware that many products that are marketed as fashionable and/or are available in a variety of bright colors and patterns are not certified or approved by the government and may not provide effective exposure reduction. Check to confirm that the product you are considering is certified as a respirator. Certified respirators contain filtration material capable of capturing particles and are designed to seal against your face without any gaps.

Note that there are many different types of FFR designs available, including cup-style, pleated-style, two-panel flatfolds, and three-panel flatfolds, as well as both valved and unvalved versions of many styles.

Other Questions

How can I help determine whether a 3M respirator is authentic or a counterfeit?

3M recommends purchasing 3M respirators from 3M authorized distributors or dealers, which will increase the likelihood that you will receive authentic 3M products.

3M does not recommend purchasing respirators from unknown sellers on multi-party internet e-commerce platforms. Here are some tips to help avoid counterfeit products:

- 3M respirators will be sold in 3M packaging, with model-specific user instructions accompanying the product
- 3M respirators should not be sold individually, or without packaging (including user instructions)
- 3M has strict quality standards, and therefore products that have missing straps, strange odors, blocked valves, misspelled words, etc. are likely not authentic 3M respirators

The [3M Safe Guard™ product authentication process](#) can be used to help ensure your 3M products are authentic. It is available only for the following models:

- 3M™ Particulate Respirator 8210
- 3M™ Particulate Respirator 8210Plus

Does carbon dioxide from exhaled breath affect health?

Carbon dioxide from exhaled breath inside of a certified filtering facepiece respirator has not been shown to affect health. A 2010 study indicated that although CO₂ levels increase inside filtering facepiece respirators (such as N95s) during wear, health indicators do not change significantly, suggesting that there is no effect on health.¹

In addition, some regulatory standards – such as Europe EN 149, China GB2626, Korea KMEOL 2017-64, Australia/New Zealand standard 1716, and Japan JMHLW notification 299 – require CO₂ levels inside the respirators to be less than 1%.

Can I use 3M™ Particulate Respirator 8612F and 8670F for an airborne infectious disease outbreak?

Two 3M respirators, the 3M™ Particulate Respirator 8612F and 8670F, were cleared by the U.S. Food and Drug Administration (FDA) in 2008 for use by the general public during very specific times. The 8612F and 8670F were authorized by the FDA during times when the FDA declared a public health medical emergency, due to situations such as an airborne infectious disease outbreak. These respirators were made available to members of the public during a brief period of time during 2009-2010, when the FDA [activated](#) and then [canceled](#) an official state of public health emergency. They were discontinued in 2013 following a long period of inactivity.

1. Williams et al. (2010) Physiological response to alterations in O₂ and CO₂ - relevance to RPD. J Intl Soc Respiratory Protection. 11: 269–281.

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Consumer Questions:

1-800-537-2191

In United States of America

Technical Service: 1-800-243-4630
Customer Service: 1-800-328-1667
3M.com/workersafety

In Canada

Technical Service: 1-800-267-4414
Customer Service: 1-800-364-3577
3M.ca/Safety

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