Centers for Disease Control and Prevention

Coronavirus Disease 2019

Interim Guidance for Conserving and Extending Filtering Facepiece Respirator Supply in Non-Healthcare Sectors

Plan, prepare, and respond to coronavirus disease 2019

Audience: This guidance is intended for use during the coronavirus disease 2019 (COVID-19) public health emergency by federal, state, and local public health officials, respiratory protection program managers, leaders in occupational health services and industrial hygiene programs, and other leaders who are responsible for developing and implementing policies and procedures for preventing occupational exposures in non-healthcare worksites.

Purpose: This document offers strategies to conserve, extend, and respond to shortages in the supply of NIOSH-approved filtering facepiece respirators (FFRs) used in non-healthcare worksites such as manufacturing and construction. NIOSH-approved FFRs protect users by filtering particles out of the air the user is breathing and include several classes of filters, including N95s.

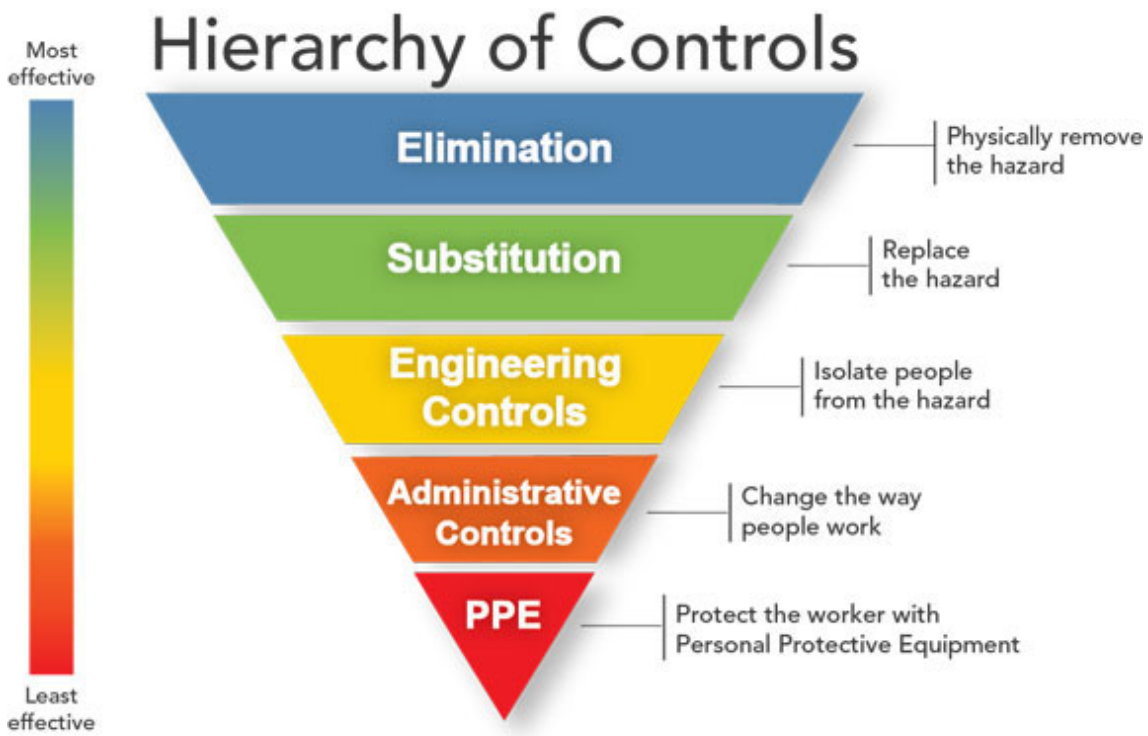
The following strategies apply the principles of the hierarchy of controls and are intended to assist employers in selecting strategies to control workplace exposures during times of known supply shortages caused by the COVID-19 pandemic. Strategies 1 and 2 reinforce employer requirements for the continuous evaluation and implementation of traditional hazard control practices such as elimination, substitution, engineering and administration controls. Other strategies described herein include certain allowances such as use of FFRs beyond the manufacturer-designated shelf life to be incorporated into practice only during times of supply shortages during the COVID-19 public health emergency.

A secondary purpose is to reduce the demand for FFRs in general industry settings during the COVID-19 response so that (1) FFR manufacturers and distributors can maximize supplies to healthcare settings and (2) general industry worksites can evaluate if any excess inventories they may hold are suitable for redistributing (e.g., selling, donating) to healthcare settings. Employers should consider redistribution of excess inventories only if adequate exposure controls for their workers are implemented. For guidance to prevent workplace exposures to acute respiratory illnesses, including COVID-19, please see CDC's Interim Guidance for Businesses and Employers.

Background

The expanding outbreak of COVID-19 in the United States has created an overwhelming demand for personal protective equipment (PPE), including NIOSH-approved FFRs, in healthcare facilities across the country. Additionally, the supply chains of PPE from manufacturing countries have been substantially disrupted due to local COVID-19 spread and demand. Because of this increase in demand and decrease in supply, CDC has provided guidance to healthcare settings for strategies to optimize their supply of N95 respirators. This guidance describes surge capacity for healthcare facilities providing care in conventional, contingency, and crisis situations. The decisions to implement measures for healthcare facilities in contingency and crisis situations are based, in part, on the availability of N95 respirators, specifically, and other types of respirators, in general.

In recognition of the demand for FFRs in the healthcare setting and the priority to protect healthcare workers who are the workers at highest risk for COVID-19, the U.S. Food and Drug Administration has issued two emergency use authorizations to allow FFRs not typically worn in healthcare settings to be worn. This may reduce the availability of these FFRs for other worksites.



Users of NIOSH-approved FFRs in non-healthcare settings should develop and implement strategies to conserve and extend their current stock of respirator supplies while protecting their workers during the COVID-19 pandemic. Employers should implement alternative controls to reduce, as much as possible, their reliance on PPE, particularly FFRs. Conventionally, a hierarchy of controls has been used to provide feasible and effective controls to protect workers. Multiple control strategies can be implemented concurrently and/or sequentially. This hierarchy can be described as follows:

- Elimination
- Substitution
- Engineering controls
- Administrative controls
- Personal protective equipment (PPE)

Elimination and Substitution

Employers should evaluate work tasks and processes to identify those activities or processes where the elimination or substitution of hazards may be implemented. While the most effective at controlling hazards, these may be the most difficult to implement in existing processes, particularly during times of national or local emergencies.

Engineering Controls

Engineering controls reduce workers' exposures by placing a barrier between the hazard and the worker or removing the hazard at the source. While the initial cost of engineering controls can be higher than the cost of administrative controls or PPE, engineering controls generally provide a cost savings over the longer term and can eliminate the need for respirators if properly designed, implemented, and maintained. Examples for consideration includes:

- Local exhaust ventilation
- Wet methods (when water is sprayed on a dusty surface or when a material is mixed with water to prevent aerosolization)
- Glove boxes, cabinets, or other enclosures for isolation of the hazard

Administrative Controls

Administrative controls are used with existing processes to limit or prevent a hazard by changing the way people work. Examples include:

- Job rotation in which workers change job tasks or areas to reduce their exposures and the need to be in respiratory protection

- Establishing policies and implementing procedures limiting the amount of time that an individual worker can work on a specific job task or in areas with high exposures
- Training workers on the hazards and controls available to reduce exposures
- Installing warning labels and signs to remind workers to stay away from hazardous job tasks or areas

Personal Protective Equipment

While engineering and administrative controls should be considered first when implementing controls, PPE can be part of a suite of strategies used to protect workers. PPE includes respirators, protective gloves, protective eyewear and face shields, and a variety of other protective gear. PPE is frequently used with existing processes where hazards are not particularly well-controlled. This method for protecting workers is typically less effective than other measures due to the reliance on the user to put on, use, and take off the PPE correctly and the potential for PPE breaches. Additionally, proper use of respiratory protection requires a comprehensive program (including medical clearance, training, and fit testing) that complies with OSHA's Respiratory Protection Standard .

Recommendations

In times of high demand and low supply of PPE due to the COVID-19 pandemic, non-healthcare sector employers should evaluate current work practices and control strategies to create a strategic exposure prevention and control plan to continue to protect workers. As part of such a plan, strategies for employers to consider are prioritized below. These measures are recommended to conserve and extend their FFR supply and to respond to shortages of manufacturer-supplied FFRs during the COVID-19 pandemic. The Occupational Safety and Health Administration (OSHA) has also provided guidance on many of these measures related to their enforcement of the Respiratory Protection Standard, 29 CFR 1910.134 , and certain other health standards, with regard to supply shortages of disposable N95 FFRs.

The following measures emphasize engineering and administrative controls to implement for exposure prevention and control plans and to reduce reliance on FFRs

1. Evaluate and execute long-term strategies for the elimination and substitution of hazards and the implementation of engineering controls for processes in which FFRs are currently required.
    a. NIOSH engineering control strategies are outlined for a variety of industries and hazards online at: https://www.cdc.gov/niosh/engcontrols/default.html
    b. Industry- and process-specific control strategies are detailed by the British Health and Safety Executive as a part of the Control of Substances Hazardous to Health (COSHH) Essentials and are available online at: https://www.hse.gov.uk/pubns/guidance/index.htm
2. Implement immediately feasible engineering and administrative controls to eliminate or minimize exposures for which employers are currently requiring the use of FFRs. These controls should be routinely evaluated to ensure they continue to control exposures to acceptable levels and include:
    a. Moving work to inside ventilated enclosures such as fume hoods and biological safety cabinets.
    b. Modifying the processes to reduce exposures, such as putting dry materials into a wet slurry to reduce the potential for exposure.
    c. Postponing non-essential work requiring the use of FFRs.
    d. Limiting the number of workers needing respirators to the minimum required to safely complete the task.
    e. Arranging work/production schedules to reduce the number of respirators needed.

The following measures may require changes in daily standard respiratory protection practices but may not have significant impact and may be used temporarily during periods of expected FFR shortages

3. Use qualitative methods to fit test workers for FFRs . Quantitative fit test methods require consuming FFRs during the fit test, while qualitative do not. As such, qualitative fit testing methods would conserve FFRs to be used for controlling workplace exposures.
4. Transition respiratory protection programs to use NIOSH-approved alternatives to FFRs, where feasible. NIOSH maintains a searchable, online version of the certified equipment list identifying all NIOSH-approved respirators. Alternatives to FFRs, in order of preference to implement at non-healthcare worksites in order to preserve as many N95s as possible for healthcare settings, include:
    a. Elastomeric half facepiece air-purifying respirators: tight-fitting respirators that are made of synthetic or rubber material permitting them to be repeatedly disinfected, cleaned, and reused. They are equipped with exchangeable filter cartridges.
    b. Elastomeric full facepiece air-purifying respirators: Like the elastomeric half facepiece respirator, the elastomeric full facepiece respirator is a reusable device that uses exchangeable filter cartridges but has a clear plastic lens that covers the face and provides eye protection.
    c. Powered air-purifying respirators (PAPRs): reusable respirators that typically have loose-fitting hoods or helmets. These respirators are battery-powered with a blower that pulls air through attached filters or cartridges. The filter is typically a high efficiency (HE) filter. Loose-fitting PAPRs do not require fit testing and can be worn by people with facial hair.
5. When non-PPE controls cannot feasibly be implemented and when no alternative respirators to FFRs can be obtained, conserve current FFR supplies on-hand by extending the employer's schedule for when they are disposed and replaced.
    a. For companies with policies allowing the regular disposal and replacement of N95s and other FFRs, extended use of these FFRs beyond normal change-out schedules, when acceptable, can also be considered. The decision to implement policies that permit extended use of FFRs should be made by the professionals who manage the institution's respiratory protection program. Criteria for disposing and replacing FFRs include when breathing through the filter material becomes too restricted rather than simply disposing of them on a regularly scheduled basis such as after a single shift. In such cases, proper training on storage of used respirators is required.
6. Use FFRs beyond the manufacturer-designated shelf life for training and fit testing.
    a. In times of shortage, you may be able to use FFRs beyond the manufacturer-designated shelf life for training and fit testing purposes. However, expired respirators might not perform to the requirements for which they were certified. Over time, components such as the strap and filter material may degrade, which can affect the quality of the fit and seal. Using such respirators for training and fit testing would allow non-expired N95 FFRs to be used for normal work operations.
7. Use respirators approved under standards used in other countries that are similar to NIOSH-approved FFRs. (See Table 1.)
    a. Within Table 1, the country, conformity assessment standards, standards and guidance documents, acceptable product classification, and NIOSH classification are provided in alphabetical order. All of these respirators have protection factors of at least 10 in the countries listed in the table, as outlined in the standards and guidance documents specified. NIOSH has confidence that devices supplied by current NIOSH-approval holders producing respirators under the various standards authorized in other countries are expected to provide the protection indicated, given that a proper fit is achieved. Non-NIOSH-approved products developed by manufacturers who are not NIOSH approval holders, including those approved by and received from China, should only be used in crisis situations when no other NIOSH-approved N95 respirator or a listed device from one of the other recognized countries is available. To ensure this level of confidence, NIOSH has developed an assessment to evaluate the filter efficiency of respirators from other countries. NIOSH is happy to conduct the testing for you and provide you the results of the testing. The webpages to request respirator assessments are available here: https://www.cdc.gov/niosh/npptl/respirators/testing/default.html.

The following measures may need to be considered during periods of known respirator shortages

8. Use FFRs beyond the manufacturer-designated shelf life for work operations.
    a. Consideration can be made to use FFRs beyond the manufacturer-designated shelf life for work operations when no other controls or respiratory protection are available. Respirators beyond the manufacturer-designated shelf life may not perform to the requirements for which they were certified. Over time,

components such as the straps and nose bridge material may degrade, which can affect the quality of the fit and seal. Many models found in U.S. stockpiles have been found to continue to perform in accordance with NIOSH performance standards. Users should take the following precautionary measures prior to using the respirator in the workplace.

i. Visually inspect the FFR to determine if its integrity has been compromised.
ii. Check that components such as the straps, nose bridge, and nose foam material did not degrade, which can affect the quality of the fit and seal and therefore the effectiveness of the respirator.
iii. If the integrity of any part of the respirator is compromised, discard the respirator and try another respirator.
iv. Users should perform a user seal check immediately after they don each respirator and should not use a respirator on which they cannot perform a successful user seal check.

9. When the above control steps are not feasible, FFR and higher levels of respiratory protection are unavailable, and alternative respiratory protection strategies are not possible, it is recommended that work activities requiring such protection be suspended.

Evaluating N95 FFR Inventories Held by General Industry for Transfer to Healthcare Settings

Employers who successfully implement strategies for conserving and extending their FFR supplies during the COVID-19 pandemic may find that they possess excess inventories. It is recommended that employers consider redistributing (e.g., selling, donating) available excess inventories to healthcare settings during the COVID-19 pandemic to help reduce known shortages of respirators. Worksites that are no longer active due to emergency work stoppages and restrictions are encouraged to consider redistributing their excess PPE and fit test kits to their state medical countermeasure contacts, the Federal Emergency Management Agency (FEMA), or through other appropriate channels. Non-healthcare employers who bought large quantities of respirators in the months preceding the crisis should consider if they are willing to redistribute (e.g., sell, donate) those respirators for healthcare use.

Table 1. Respirators Approved Under Standards Used in Other Countries That Are Similar to NIOSH-Approved N95 Filtering Facepiece Respirators

Country	Performance Standard	Acceptable Product Classification	May Be Used in Lieu of NIOSH-Certified Products Classified as
Australia	AS/NZS 1716:2012	P2	N95
		P3	N99 or lower
Brazil	ABNT/NBR 13698:2011	PFF2	N95
		PFF3	N99 or lower

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