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Technical Bulletin

August, 2022
Revision 10

Cleaning and Disinfecting 3M Reusable Elastomeric Half and Full Facepiece Respirators following Potential Exposure to Coronaviruses

Description

During coronavirus outbreaks, some healthcare organizations may assign reusable elastomeric facepiece respirators to workers providing care for patients with suspected or confirmed cases of coronavirus. This document contains considerations related to cleaning and disinfecting facepieces that will be reused after potential exposure to coronaviruses. 3M facepieces covered in this document: 3M™ Half Facepieces 6000, 6500, 7500, and HF-800 Series and 3M™ Full Facepieces 6000 and FF-400 Series. Photos of each respirator series are shown below.

6000 Series	6500 Series	7500 Series	HF-800 Series	6000 Series	FF-400 Series
					

The 2008 U.S. Centers for Disease Control and Prevention (CDC) publication Guideline for Disinfection and Sterilization in Healthcare Facilities [1] (updated May 2019) includes information on disinfecting equipment and surfaces potentially contaminated by coronaviruses. The U.S. CDC investigated many chemicals and cited several chemical germicides as being effective for coronaviruses, when used as indicated in the product user instructions. In regions outside the United States, where EPA-registered disinfectants may be unavailable, this CDC publication will be most helpful in addition to considering all applicable local guidance for your region as it relates to disinfection for coronaviruses.

More recently, the CDC has published Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic[2] indicating that EPA-registered, hospital-grade disinfectants are appropriate for SARS-CoV-2 in healthcare settings. The United States Environmental Protection Agency (EPA) published List N: Disinfectants for Use Against SARS-CoV-2 [3]. It is a list of EPA's registered antimicrobial products for use against novel coronavirus SARS-CoV-2, the cause of COVID-19, as a reference for specific disinfectants that can be used against coronaviruses. Locations in Canada may also want to refer to the Health Canada List of Hard Surface Disinfectants for COVID-19.[4]

NOTE: 3M relies on the expertise of the CDC and EPA with respect to microbiological efficacy and has not evaluated the effectiveness of these agents with regards to inactivating viruses on 3M equipment.

Filters, Cartridges, Retainers and Adapters

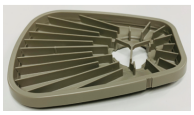
3M does not recommend cleaning or disinfection of filter media (e.g., disc-style filters and pre-filter pads). However, some 3M filter products have a hard-plastic case surrounding the filter media, i.e., NIOSH part numbers 7093, 7093C, 6092X,

D8092X, and 604 Exhalation Valve Filter* as well as EN (European) part numbers 603X, 609X, D809X and D903X. The outside surface of the hard-plastic case can be wiped down for cleaning and disinfection using a clean damp cloth soaked in solution. For disinfecting solution, apply until visibly wet for the appropriate contact time and then remove the disinfecting solution with a clean, water-soaked cloth and air dry. Do not allow the cleaning or disinfecting solution to reach the internal filter media and do not submerge the hard-case filters in any liquid. For filters with hard plastic cases, utilize the same cleaning and disinfection solutions as recommended for 3M facepieces. The table below shows cleaning and disinfection methods for various 3M filters.

*The 604 Exhalation Valve Filter is an optional accessory that allows the 6000 Series half facepiece respirator to be used for source control.

Image				
Name	**Disc Filters**	**Pre-Filter Pads**	**Hardcase Filters**	**Gas/Vapor/ Particulate Cartridges**
Wipe outside surface with clean damp cloth soaked in solution. Follow applicable instructions for cleaning and disinfecting solutions. Do not allow liquid to reach the filter media.	✗	✗	✓	✓

3M™ Filter Retainers 501 and D701 and 3M™ Filter Adapter 603 are hard plastic components used to attach pre-filter pads to facepieces. The 501 and 603 can be either wiped, sprayed or soaked in disinfecting solution. If the 501/603/pre-filter assembly or 501/pre-filter/cartridge assembly are to be cleaned and disinfected, they can only be cleaned by wiping the outside surfaces of the 501, 603, or cartridge with a clean damp cloth soaked in solution. For disinfecting solution, ensure the outside surfaces are visibly wet for the appropriate contact time and then remove the disinfecting solution with a clean, water-soaked cloth and air dry. Do not allow the cleaning or disinfecting solutions to reach the pre-filter and do not spray or submerge the assembly in any liquid. Utilize the same cleaning and disinfection solutions as recommended for 3M facepieces. The table below shows cleaning and disinfecting methods for 3M pre-filter assemblies and components.

Image					
Name	**603 Filter Adapter**	**501**	**Pre-Filter Pad**	**603/501/Pre-filter Assembly**	**501/Pre-filter pad/cartridge Assembly**
Cleaning and Disinfection Method	Wipe, spray or soak	Wipe, spray or soak		Wipe outside surfaces with clean damp cloth soaked in solution. Follow applicable instructions for cleaning and disinfecting solutions. Do not allow liquid to reach the pre-filter.	

When to Change Reusable Respirator (RR) Filters Used to Help Reduce Exposure to Airborne Biological Aerosols

Particulate filter change schedules for **RR** are determined by two main considerations: filter loading (clogging of the filter from captured particulates) and a facility's infection prevention policy. If the **RR respirator** is being used to reduce exposure to airborne biological aerosols such as droplets containing viruses or bacteria, the filter will not typically load from these particles to the point **that an increase in breathing resistance occurs**. As a result, loading or clogging of **RR** filters is typically not an issue when used to help reduce exposure to biological aerosols.

In healthcare facilities, **RR** filter change schedules for airborne biological aerosols are primarily determined by the facility's infection prevention policy. The infection prevention policy should be developed based on applicable national, state, and local guidelines. Most healthcare organizations develop their filter use and reuse policy based on the biological agent of concern, likelihood of the filter becoming contaminated, and potential for patient-to-patient and patient-to-worker cross-contamination. While the outside filter body **of encapsulated filters** can be wiped down for cleaning and disinfection, do not attempt to clean the filter media inside the filter body. When changing the **RR** filter, follow the hygiene and infection prevention practices established by your employer based on the specific contaminants to which the respirator assembly has been exposed and the cleaning and disinfecting agent used. Dispose of the filter according to your infection prevention policy and all applicable requirements. Close consideration needs to be given to the policies and practices used for cleaning and disinfecting the **RR**. It is important to remember that a **RR** is used to filter out contaminants from the air, and therefore contaminants may be concentrated on the filter/cartridge itself, and potentially on other surfaces of the **RR** system. Proper cleaning and maintenance instructions and considerations for **RR** systems can be found in the specific User Instructions for each product.

NOTE: The guidance in this Technical Bulletin may exceed the directions found in certain 3M facepiece *User Instructions* and is therefore intended only for cleaning and disinfecting the specified respirators following potential exposure to coronaviruses. Note that respirator components may experience detrimental effects such as degradation over time with prolonged or extended use of disinfectant products. As discussed in the product *User Instructions*, users must inspect their respirator prior to each use. If you discover any signs of damage, remove the respirator from service and either replace components or replace the entire facepiece as appropriate, following the guidance in the product *User Instructions*.

Respirator Facepieces

Your facility should review this information thoroughly prior to selecting a disinfectant for your equipment and specific application. Follow the hygiene and infection prevention practices established by your facility for the targeted organisms, including coronaviruses.

Please always refer to the latest information from trusted sources such as the World Health Organization (WHO), the U.S. Centers for Disease Control and Prevention (US CDC), the US Occupational Safety and Health Administration (OSHA) and the European Centres for Disease Prevention and Control (ECDC) regarding selection, use, maintenance and cleaning/disinfection of personal protective equipment.

Expected Compatibility of 3M Reusable Respirator Facepieces with Certain Disinfectants

This table shows expected compatibility of 3M reusable respirator facepieces with various disinfectants based on a review of chemical compatibility data between facepiece materials and disinfectant ingredients. For select disinfectants, compatibility testing between the facepiece and disinfectant product was performed by 3M. Please note that prolonged use of any cleaning/disinfecting agent can potentially shorten the useful life of the respirator.

	6000 Series 	**6500 Series** 	**7500 Series** 	**6000 Series FF*** 	**FF-400 Series**  **FF***
3M™ Neutral Quat Disinfectant Cleaner Concentrate 23A (EPA Reg. No. 47371-129-10350)	✓	✓	✓	✓	✓
PeridoxRTU® (EPA Reg. No. 8383-13)	✓	✗	✓	✓	✗
ECOLab® Klercide™70/30 IPA (EPA Reg. No. 1677-249)	✓	✓	✓	✓	✓
3M™ C. Diff solution tablets (EPA Reg. No. 71847-6-10350)	✓	✓	✓	✓	✓
Super Sani-Cloth® Germicidal wipes (EPA Reg. No 9480-4)	✓	✓	✓	✓	✓

	6000 Series	6500 Series	7500 Series	6000 Series FF*	FF-400 Series FF*
					
Sani-Cloth® Bleach Germicidal wipes (EPA Reg. No 9480-8)	✓	✗	✓	✓	✗
Sani-Cloth® Prime Germicidal Disposable Wipe (EPA Reg. No. 9480-12)	✓	✓	✓	✓	✓
Oxivir® Tb (EPA Reg. No. 70627-56)	✓	✗	✓	✓	✗

*Full facepiece lenses have chemical resistant coatings, but lens is susceptible to deterioration due to disinfectant exposure. It is recommended that full facepieces be fully disassembled prior to washing to ensure disinfectant can be effectively washed away. While these disinfectants listed above are believed to be generally compatible with certain 3M Full Facepiece Respirators, **testing per the ANSI Z87.1 Eye Protection Standard has NOT been performed after use of these disinfectants.**

Other possible disinfection methods:

- Sodium hypochlorite solution at an appropriate dilution and contact time as outlined by the CDC[6]
- 70% Isopropanol solution with 1-minute contact time

Note: Use of IPA solution resulted in degradation of inhalation valves after ~ 20 cycles, for some 3M facepieces. Disinfecting full facepiece respirators can cause the facepiece lens to craze and appear cloudy over time. Pay close attention to these areas during inspection, for all facepieces and replace components as needed.

Many decontamination methods are likely not appropriate for use with 3M reusable respirators due to potential for product degradation or damage. 3M has not evaluated and so DOES NOT recommend the following for use on reusable elastomeric facepieces or their filters/cartridges:

- Ethylene oxide or formaldehyde
- Ionizing Radiation
- Microwave
- High Temperatures above 75°C, such as Autoclave or Steam
- Ozone
- Vaporized Hydrogen Peroxide (VHP)

Cleaning and Disinfecting 3M Half and Full Facepieces

1) Cleaning is recommended after each use. Nitrile or vinyl gloves should be worn during cleaning as well as other personal protective equipment (PPE) as indicated.
2) Remove any filters or cartridges. The facepiece may be further disassembled as necessary.
3) Inspect the facepiece per the User Instructions to identify any damage or excessive wear. Replace components or the entire facepiece as necessary.
4) Manually clean the facepiece by immersing it in warm water not to exceed 120°F (49°C), and scrub with soft brush until clean. Add neutral detergent. Do not use cleaners containing lanolin or other oils. **NOTE:** Solvents and strong detergents may damage 3M facepieces and should not be used for cleaning.
5) Rinse thoroughly with fresh warm water.
6) Disinfect by soaking, wiping or spraying the facepiece according to the user instructions for the selected disinfectant, including application and contact time.
7) Rinse, wipe or spray the facepiece thoroughly with fresh warm water.
8) Air dry in a non-contaminated area.
9) Inspect and reassemble the respirator as described in the *User Instructions*.
10) The respirator should be stored in a non-contaminated area when not in use.

Interim Wipe Cleaning and Disinfection of 3M Half and Full Facepieces

Wipe cleaning and disinfection of the facepiece can be considered as an interim method. This method is not to be the only method of cleaning.

1) If gross contamination or facial oil is present, a cleaning step should be performed before disinfection. Wipe all components with cleaning solution, including the interior and exterior of the facepiece and head harness.
2) Wipe the interior and exterior of the facepiece and head harness with the selected disinfectant, following the disinfectant user instructions including application and contact time.
3) Wipe all components with clean water to remove residual chemical.
4) Air dry or hand dry prior to next use in a non-contaminated area.
5) Inspect prior to use as described in the *User Instructions*.
6) The respirator should be stored in a non-contaminated area when not in use.

Glossary of Terms

Below is a glossary of terms used in this document [4,5]:

Cleaning: Removal of soil (organic and inorganic) and foreign material from objects and surfaces. This is typically accomplished with water and mechanical action. Detergents may be used to assist the process.

Disinfection: A process of inhibiting or destroying disease-producing microorganisms (but may not kill bacterial spores). It usually involves the use of chemicals, heat, and/or ultraviolet light and is divided into three categories: high, intermediate and low-level disinfection.

NOTE: Failure to remove foreign material (soil, face oils, etc.) from an object can make the disinfecting process ineffective.

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If you have any questions or concerns, please contact your local 3M representative or 3M Technical Service.

References

1) Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008; updated 2019. United States Centers for Disease Control. William A. Rutala, Ph.D., M.P.H., David J. Weber, M.D., M.P.H. and the Healthcare Infection Control Practices Advisory Committee (HICPAC). 2008. https://www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines-H.pdf
2) Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic. https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html
3) List N. EPA's Registered Antimicrobial Products for Use Against Novel Coronavirus SARS-CoV-2, the Cause of COVID-19. United States Environmental Protection Agency. 03/03/2020. https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2
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5) Rutala, WA. American Journal of Infection Control. APIC Guideline for Selection and Use of Disinfectants. Vol. 24, No. 4, pp. 313-342, August 1996.
6) Elastomeric Respirators: Strategies During Conventional and Surge Demand Situations Conventional, Contingency, and Crisis Strategies. https://www.cdc.gov/coronavirus/2019-ncov/hcp/elastomeric-respirators-strategy/index.html

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