3M Personal Safety Division

Cartridge and Filter Guide

User Information to Help Optimize Protection

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This is your guide***

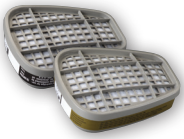
The purpose of this guide is to additional information to assist you with 3M™ Particulate Filters and 3M™ Gas & Vapor Cartridges that you use with your 3M™ Half Facepiece or Full Facepiece Reusable Respirators.

***This booklet is designed to be a guide only. For additional information to assist you with 3M Respiratory Products (e.g., choosing a 3M Respirator, Fit Testing, and when to change your 3M™ Particulate Filters and 3M™ Gas & Vapor Cartridges) call 3M Technical Service Helpline at 1-800-243-4630 or talk to your 3M PSD Sales Representative.

What types of 3M™ Filters & Cartridges are there?

3M™ Particulate Filters:
Filters only aerosols (e.g., dust, mists, fumes, smoke, mold, bacteria, etc). Some filters also have nuisance-level gas and vapor capabilities.

3M™ Gas & Vapor Cartridges:
Filters only gases and vapors. There are different kinds of cartridges for different kinds of gases and vapors.



3M™ Combination Cartridge/Filters:
Filters particles, gases and vapors. Different combination particulate/cartridge filters are used depending on the gas or vapor present in the air.

How do 3M™ Particulate Filters work?

3M™ Particulate Filters

Filters capture particles through the mechanisms of impaction, interception and diffusion. Additionally, these filters are enhanced with electrostatically charged fibers to help trap particulates within the filter media.

As particulate filters load up with the contaminant, they typically become more efficient; however, they also become harder to breathe through.

NIOSH has nine classifications for particulate filters based on minimum filtration efficiency and the type of aerosol (non-oil or contains oil). The chart below shows the nine classifications.

Filter classifications, efficiencies, oil resistances and challenge agents specified under 42 CFR part 84

42 CFR part 84	Oil Resistance Categories		
Minimum Efficiency	N Non-oil Aerosols	R Includes oil Aerosols*	P Includes oil Aerosols**
95%	N95	R95	P95
99%	N99	R99	P99
99.97%	N100	R100	P100

*May have a time use restriction on this filter series when oil aerosols are present.
**Use according to manufacture's time use restrictions when oil aerosols are present.

Why do I need to replace my 3M™ Filters regularly?

As particles are collected on the filter media, the respirator will eventually become more difficult to breathe through comfortably.

When do I replace my 3M™ Particulate Filters?

3M™ Half Facepiece Reusable Respirator 6000 Series 6100, 6200, 6300

Replace 3M™ Particulate Filters when:

- It becomes difficult to breathe comfortably (this will vary from individual to individual).
- The filter becomes dirty or physical damage occurs.
- For P series filters only when used in environments containing oil aerosols:
  - Dispose of P-Series filters after 40 hours of use or 30 days, whichever is first.

For guidance on filter replacement frequency, visit 3M.com/filterchange.

How do 3M™ Gas & Vapor Cartridges work?

3M™ Gas & Vapor Cartridges

These cartridges utilize sorbent material to filter the gas or vapor molecules. Typically the sorbent is activated carbon. Different chemical treatments may also be added to the surface of the activated carbon to adsorb different types of gases or vapors. When the cartridges reach their capacity, the gases or vapors start to come through the cartridge to the user. This is called “breakthrough.”

NIOSH uses a classification system to identify the different types of contaminants these treated carbon grains will capture.

Color Coding for 3M™ Chemical Cartridges		
6001	Organic Vapor	Black
6002	Acid Gases	White
6003	Organic Vapor/Acid Gases	Yellow
6004	Ammonia/Methylamine	Green
6005	Formaldehyde/Organic Vapor	Olive/Black
6006	Multi-Gas/Vapor	Olive
6009	Mercury Vapor/Chlorine Gas	Orange

When do I Replace my 3M™ Gas & Vapor Cartridges?

The service life (i.e., how long it will last) of any gas and vapor cartridge is affected by many factors such as the: contaminant, contaminant concentration, breathing rate, humidity level, temperature and other use conditions.

Replace 3M™ Gas & Vapor Cartridges:

- In accordance with your established change schedule or government regulation.
- Or sooner if the contaminant can be detected inside the respirator by smell or taste.

To avoid using your 3M™ Gas & Vapor Cartridges beyond their service life, take the following steps:

- Before use, check the expiration date printed on the package of your 3M™ Gas & Vapor Cartridges.
- Write the date on the cartridges when first removed from the pack.
- Change in accordance with your established cartridge change schedule or government regulation.
- If at any time you smell or taste the contaminant or irritation is detected, leave the contaminated area immediately and try adjusting your respirator and/or change the respirator cartridges.

To help establish how frequently cartridges should be replaced, visit 3M.com/ServiceLifeSoftware to access 3M™ Service Life Software.

For specific advice on when to change 3M™ Particulate Filters and 3M™ Gas & Vapor Cartridges call the 3M Technical Service Helpline 1-800-243-4630.

Frequently Asked Questions

3M™ Ultimate FX Full Facepiece Reusable Respirator FF-400 Series FF-401, FF-402, FF-403

What is the shelf life of 3M™ Cartridges?
Provided they are stored unopened in the original packaging and away from direct sunlight, humidity and sources of high temperature, cartridges will last five years from manufacture date. See "use by" date on packaging.

How should I store my 3M™ Respirator Cartridges and Filters?
Prior to first use and when not in use, your 3M™ Respirator, Cartridges and Filters should be kept clean, cool and dry, away from contaminated atmospheres to avoid deterioration. Store cartridge in a sealed container or bag.

Why do I need to use a 3M™ Particulate Filter with my 3M™ Gas & Vapor Cartridges for some applications?
The particulate filter helps remove tiny droplets or particles in the air (e.g., mists from spray painting). The gas and vapor cartridges do not help filter these particles.

What is a Fit Test?
Because everyone's face is different, a fit test is used to determine if there is an adequate seal between the edge of a respirator and the face of the wearer. OSHA requires this to be done before the respirator is first issued and then at least annually.

Can I wear a tight-fitting respirator with a beard?
No. OSHA requires respirator wearers be clean-shaven. Do not use a tight-fitting respirator with beards or other facial hair or other conditions that prevent a good seal between the face and the faceseal of the respirator.

Why are the filters and cartridges "pink"?
When a filter or cartridge has the magenta color code it has the P100 designation. This color provides uniformity and easy identification.

Respirator and Filter/Cartridge Matrix

Possible combinations for facepieces, cartridges, filters, retainers and adapters.

3M™ Half Facepiece Reusable Respirator 6000 Series

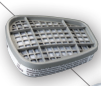
3M™ Half Facepiece Reusable Respirator 6500 Series

3M™ Half Facepiece Reusable Respirator 7500 Series

3M™ Full Facepiece Reusable Respirator 6000 Series

3M™ Full Facepiece Reusable Respirator 7800 Series

3M™ Ultimate FX Full Facepiece Reusable Respirator FF-400 Series



6000 Series*

502

2000 Series
2200 Series

6000 Series*

603

5000 Series

501

6000 Series

5000 Series

501

2000 Series
2200 Series

7093
7093C

*The full range of 6000 Series of Gas & Vapor Cartridges can be found on pages 13-18

3M™ Half Facepiece Disposable Respirator 5000 Series

6000 Series Cartridge

502

2000 Series
2200 Series

6000 Series Cartridge

5N11
5P71

501

3M™ Particulate Filters

3M Particulate Filters 2000, 2200 and 7093 Series can be attached to all 3M™ Respirators with bayonet connections.

The 2000, 2200 and 7093 Series filters can also be attached to 3M™ 6000 Series Cartridges using the 3M™ 502 Filter Adapter.

The 3M™ 5N11 and 5P71 Filters can be attached to the 3M™ Half Facepiece Disposable 5000 Series Respirator or 6000 Series Cartridges using the 3M™ 501 Filter Retainer. They can also be attached to 3M™ Respirators with bayonet connections using the 603 adapter.

Note: All 3M™ Respirator, cartridge, filter combinations must be in accordance with NIOSH approvals.

3M's bayonet-style cartridge connection for easy to fit filters and cartridges.

3M™ Particulate Filters

Product Code	Description
2071	NIOSH approved for environments containing certain oil and non-oil based particles.
2076HF	NIOSH approved for hydrogen fluoride and certain oil and non-oil based particles. 3M recommended for relief against nuisance levels* of acid gases.
2078	NIOSH approved for environments containing certain oil and non-oil based particles. 3M recommended for relief against nuisance levels* of organic vapor/acid gases and for ozone protection up to 10 times OSHA PEL. Not NIOSH certified for use against ozone.
2091	NIOSH approved for environments containing certain oil and non-oil based particles.
2096	NIOSH approved for environments containing certain oil and non-oil based particles. 3M recommended for relief against nuisance levels* of acid gases.
2097	NIOSH approved for environments containing certain oil and non-oil based particles. 3M recommended for relief against nuisance levels* of organic vapors and ozone protection up to 10 times OSHA PEL. Not NIOSH certified for use against ozone.
2291	NIOSH approved for environments containing certain oil and non-oil based particles.
2296	NIOSH approved for environments containing certain oil and non-oil based particles. 3M recommended for relief against nuisance level acid gas.

3M™ Rugged Comfort Half Facepiece Reusable Respirator 6500 Series 6501, 6502, 6503

Classification

P95

P95/HF

P95

P100

P100

P100

P100

P100

*3M recommended for relief against nuisance levels of acid gases and/or organic vapors. Nuisance level refers to concentrations less than the OSHA PEL or applicable governmental occupational exposure limits, whichever is lower. Do not use for respiratory protection against acid gases or organic vapors.

3M™ Particulate Filters, continued

Product Code	Description
2297	NIOSH approved for environments containing certain oil and non-oil based particles. 3M recommended for relief against nuisance level* organic vapors.
5N11	NIOSH approved for environments containing certain non-oil based particles. Use with 3M™ Respirators 5000 Series or 3M™ Cartridges 6000 Series, and 3M™ Filter Retainer 501.
5P71	NIOSH approved for environments containing certain oil and non-oil based particles. Use with 3M™ Respirators 5000 Series or 3M™ Cartridges 6000 Series, and 3M™ Filter Retainer 501.
7093	NIOSH approved for environments containing certain oil and non-oil based particles. Commonly used in the Abatement market, the filter is encapsulated in a hard shell to protect it from the decontaminating water spray showers.
7093C	NIOSH approved for hydrogen fluoride and certain oil and non-oil based particles. 3M recommended for relief against nuisance levels* of organic vapor/acid gases. Commonly used in the Abatement market, the filter is encapsulated in a hard shell to help protect it from the decontaminating water spray showers.
501	Filter Retainer used to hold 3M™ Particulate Filters 5N11 and 5P71/07194 (AAD) in place on top of 3M™ Respirators 5000 Series and 3M™ Cartridges 6000 Series.
502	Filter Retainer used to attach 3M™ Particulate Filters 2000 Series, 2200 Series and 7093 to 3M™ Respirators 5000 Series and 3M™ Cartridges 6000 Series.
603	Filter Adapter use to connect 5000 Series Particulate Filters only to the respirator. Also need a 3M™ Filter Retainer 501.

3M™ Half Facepiece Reusable Respirator 6000 Series 6100, 6200, 6300

Classification

P100

N95

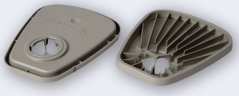
P95

P100

P100/HF

For use with 5N11 and 5P71

For use with 2000 Series, 2200 Series and 7093/7093C filters



*3M recommended for relief against nuisance levels of acid gases and/or organic vapors. Nuisance level refers to concentrations less than the OSHA PEL or applicable governmental occupational exposure limits, whichever is lower.

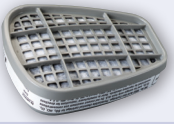
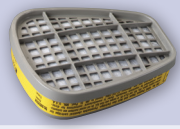
3M™ Gas & Vapor Cartridges

Product Code	Description
6001	NIOSH approved against certain organic vapors.
6002	NIOSH approved against certain acid gases: Chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen sulfide.
6003	NIOSH approved against certain organic vapors or acid gases.*
6004	NIOSH approved against ammonia and methylamine.

The 6001, 6002, 6003, 6004, 6005, 6006, and 6009 cartridges are available with the P100 prefilter as a combination filter/cartridge.

*Chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen sulfide, hydrogen fluoride.

Classification

OV		
AG		
OV/AG		
A/MA		

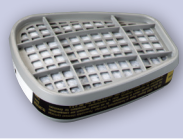
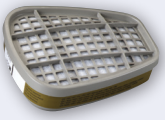
3M™ Gas & Vapor Cartridges, continued

Product Code	Description
6005	NIOSH approved against formaldehyde and certain organic vapors.
6006	NIOSH approved against certain organic vapors, acid gases*, ammonia, methylamine or formaldehyde.
6009S	NIOSH approved against mercury vapor, chlorine and sulfur dioxide.
60921	NIOSH approved against certain organic vapors and particulates.
60923	NIOSH approved against certain organic vapors, acid gases* and particulates.
60926	NIOSH approved against certain organic vapors, acid gases*, ammonia methylamine, formaldehyde and particulates.

*Chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen sulfide, hydrogen fluoride.

3M™ Rugged Comfort Half Facepiece Reusable Respirator 6500 Series 6501, 6502, 6503

Classification

Form/OV		
Multi-G/V		
Hg/Cl		
OV/P100		
OV/AG/P100		
Multi-G/V/P100		

3M™ Gas & Vapor Cartridges, continued

Product Code	Description
60922	NIOSH approved against chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen sulfide and particulates.
60924	NIOSH approved against ammonia, methylamine and particulates.
60925	NIOSH approved against formaldehyde[1], certain organic vapors and particulates.
60928	NIOSH approved against certain organic vapors, chlorine, hydrogen chloride, sulfur dioxide, hydrogen sulfide, hydrogen flouride and particulates[2].
60929S	NIOSH approved against mercury vapor, chlorine, sulfur dioxide and particulates.

3M™ Half Facepiece Reusable Respirator 7500 Series 7501, 7502, 7503

Classification

AG/P100 Acid Gas/P100		
AM/MA/P100 Ammonia/ Methylamine/P100		
FM/OV/P100 Formaldehyde/ Organic Vapor/P100		
OV/AG/P100 Organic Vapor/ Acid Gas/P100		
HG/P100 Mercury/P100		

[1]OSHA regulations require gas proof goggles be worn with the half facepiece respirators when used against formaldehyde.

[2]3M recommended for use against methylbromide or radioiodine up to 5 ppm with daily cartridge replacement.

3M Help and Advice

To establish cartridge/filter replacement frequency visit:
Cartridges: 3M.com/ServiceLifeSoftware to access 3M™ Service Life Software
Filters: 3M.com/filterchange

Technical Service Helpline
For further information on 3M™ Respirators and when to change 3M™ Particulate Filters and 3M™ Gas & Vapor Cartridges (or any of our other 3M Safety Products) phone our Technical Service Helpline in the United States: 1-800-243-4630.

Specialist Sales Force
You can also talk to your 3M PSD Sales Representative for information on:

- Selecting 3M™ Respirators and when to change your 3M™ Particulate Filters and 3M™ Gas & Vapor Cartridges.
- Respirator Training Programs and Fit Testing.
- A visit to your work site to discuss which 3M respirators you may want to consider for your environment and workers.

3M Personal Safety Division Website:
Use our website to access product information and training tools at 3M.com/PPESafety.

⚠WARNING

These respirators help reduce exposures to certain airborne contaminants. Before use, the wearer must read and understand the *User Instructions* provided as a part of the product packaging. A written respiratory protection program must be implemented meeting all the requirements of OSHA1910.134 including training, fit testing and medical evaluation. In Canada, CSA standards Z94.4 requirements must be met and/or requirements of the applicable jurisdiction, as appropriate. **Misuse may result in sickness or death.** For proper use, see package instructions, supervisor, or call 3M PSD Technical Service in USA at 1-800-243-4630 and in Canada at 1-800-267-4414.

To Get Started, Contact Your 3M Representative:

Technical Service: 1-800-243-4630
Customer Care Center: 1-800-328-1667
Web: 3M.com/PPESafety

Not a substitute for employer compliance with all applicable regulations.

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