

Air Purifying Respirator

INSTRUCTIONS FOR USE AND CARE

Utilizing a Pressure Demand to Demand Conversion Adapter kit

⚠ WARNING

This manual, including the warnings and cautions inside, must be read and followed carefully by all persons who use or maintain this product, including those who have any responsibility involving its selection, application, service or repair. This respirator will perform as designed only if used and maintained according to the instructions. Otherwise, it could fail to perform as designed, and persons who rely on this product could sustain serious personal injury or death.

See separate insert for NIOSH Approval Information. (P/N 10029876).

See inside for Instructions, Warnings and Limitations. Please call 1-800-MSA-2222 during regular working hours.



MSA

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MINE SAFETY APPLIANCE COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

INTRODUCTION

TABLE OF CONTENTS

NIOSH Approval Information.....	2	Attaching Cartridge/Filter	8
Special or Critical User's Instructions ...	3	Donning the Respirator	8
Respirator Use Limitations	4	Test for Tightness Before Each Use...	8
Exposure Limits.....	5	Removing the Adapter from the	
Exposure Limits for Mixtures.....	6	Facepiece	9
Respirator Fit Test	6	Cleaning and Disinfecting.....	9
Preparations For Use.....	7	Maintenance/Repair	10
Attaching Adapter to Facepiece.....	7		

NIOSH APPROVAL INFORMATION

1. Protection

P100—Particulate Filter (99.97% filter efficiency level) effective against all particulate aerosols.

P95—Particulate filter (95% filter efficiency level) effective against all particulate aerosols.

N95—Particulate Filter (95% filter efficiency level) effective against all particulate aerosols free of oil; time use restrictions may apply.

R95—Particulate Filter (95% filter efficiency level) effective against all particulate aerosols; time use restrictions may apply.

- AM - Ammonia
- CD - Chlorine dioxide
- CL - Chlorine
- FM - Formaldehyde
- HC - Hydrogen chloride
- HF - Hydrogen fluoride
- HS - Hydrogen sulfide (escape only)
- MA - Methylamine
- MV - Mercury vapor
- OV - Organic Vapor
- SD - Sulfur dioxide

- CS - Chlorobenzylidene malononitrile
- CN - Choroacelphenone

2. Cautions and Limitations

- A. Not for use in atmospheres containing less than 19.5 percent oxygen.
- B. Not for use in atmospheres immediately dangerous to life or health.
- C. Do not exceed maximum use concentrations established by regulatory standards.
- H. Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridges and canisters are replaced before breakthrough occurs.
- I. Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA / NIOSH.
- J. Failure to properly use and maintain this product could result in injury or death.
- L. Follow the manufacturer's Users Instructions for changing cartridges, canister and/or filters.

INTRODUCTION

- M. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.
- N. Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.
- O. Refer to User's Instructions and/or maintenance manuals for information on use and maintenance of these respirators.
- P. NIOSH does not evaluate respirators for use as surgical masks.
- S. Special or critical User's instructions and/or specific use limitations apply. Refer to User's Instructions before donning.

S - SPECIAL OR CRITICAL USER'S INSTRUCTIONS

- 1. Special Instructions for Mersorb-P100/ Mersorb® Cartridges —
 - a. Mersorb-P100/Mersorb cartridges can be used against a mixture of chlorine and mercury that are both present simultaneously, but cannot be used if alternating between mercury-contaminated atmospheres and chlorine-contaminated atmospheres.
 - b. Service Life Indicator - The Mersorb-P100 Mersorb respirator utilizes an End of Service Life Indicator (ESLI) for use against

- metallic mercury vapor. The ESLI must be readily visible to the wearer of this respirator without manipulation of either the respirator, cartridges, facepiece or the indicator. If you can not readily see the indicator, do not wear the respirator. The ESLI band around the side of each Mersorb-P100/Mersorb cartridge consists of chemically treated paper. In use, as the paper is exposed to metallic mercury vapor, it changes from orange to brown. When the indicator color changes to brown, the cartridge is beginning to lose its effectiveness against metallic mercury vapor and must be replaced. Thus, the wearer has a constant, positive check on the condition of his cartridge.
- c. Do not enter any atmospheres with this respirator unless you know that; you are not colorblind and can distinguish between the beginning and ending colors of the end-of-service-life indicator (when using Mersorb-P100/Mersorb respirators only).

INSTRUCTIONS FOR USE AND CARE BY PROPERLY TRAINED AND QUALIFIED PERSONNEL

WARNING

- 1. This device does NOT supply oxygen, and must only be used in adequately ventilated areas containing at least 19.5 percent oxygen.
- 2. This respirator must be used in conjunction with the proper

RESPIRATOR USE LIMITATIONS

chemical or particulate cartridges for protection against specific contaminants.

3. Do not use when concentrations of contaminants are unknown or immediately dangerous to life or health (IDLH).
4. Do not use when appropriate exposure limit (OSHA PEL, NIOSH REL, ACGIH TLV, etc.) is not known.
5. Leave area immediately if:
 - A. Breathing becomes difficult.
 - B. Dizziness or other distress occurs.
 - C. You taste or smell contaminant.
 - D. You experience nose or throat irritation.
6. Use strictly in accordance with instructions, labels, and limitations pertaining to this device.
7. This respirator may not provide a satisfactory seal with certain facial characteristics, such as beards or large sideburns, that prevent direct contact between the skin and the sealing surface of the facepiece. Do not use this respirator, if such conditions exist.
8. Never alter or modify this device.
9. This respirator is for use by trained, qualified personnel only.

Failure to follow the above warnings can result in serious personal injury or death.

WARNING

Do not use for urethane paints or other paints containing diisocyanates unless an appropriate cartridge change-out schedule is developed. Due to their poor warning properties, over exposure can occur without user awareness and result in severe permanent damage to the respiratory system. If unable to develop an appropriate change-out schedule, use an air-supplied respirator or SCBA.

CAUTION

When using filters in an application that produces sparks, ensure that they are protected by a shield. Contact with sparks can damage filters and reduce protection.

RESPIRATOR USE LIMITATIONS

The wearer must comply with the following respirator use limitations:

1. MAXIMUM USE CONCENTRATION — Do not exceed any of the following:
 - A. 100 times the exposure limit for the contaminants present.
 - B. Immediately dangerous to life or health (IDLH) concentration for any contaminant present.
2. The limitations outlined in the applicable NIOSH approval.
3. For respirators with class N or R filters: Replace filters after no more than 8 (eight) hours of use (continuous or intermittent) or sooner if excessive breathing resistance

RESPIRATOR USE LIMITATIONS

occurs while inhaling. Service time can be extended by performing an evaluation in the specific workplace setting that demonstrates (a) that the extended use will not degrade the filter below the efficiency level for which it is approved, or (b) that the total mass loading of the filter is less than 200 mg.

4. For respirators with class P filters: Replace filters when excessive breathing resistance occurs while inhaling.
5. For respirators with chemical cartridges:
 - a. Users must follow an appropriate cartridge change-out schedule developed by a qualified professional. The change-out schedule must take into account all factors that may influence respiratory protection including specific work practices and other conditions unique to the works environment. Cartridges equipped with an end-of-service-life indicator for a specific contaminant present must be replaced when the indicator changes to the specified color or sooner if using the respirator against a mixture and the cartridge change-out schedule specifies an earlier replacement.
 - b. If using the respirator against substances having poor warning properties, over exposure can occur without user awareness. Take appropriate precautions to prevent over exposure, which may include an earlier cartridge change-out, or using an air-supplied respirator or SCBA. For further information refer to MSA's Response Respirator Selector.
- c. Replace cartridges every shift or sooner, if indicated by change-out schedule or end-of-service-life indicator. Use beyond one shift could result in shorter than expected service time and over exposure due to contaminant description and migration through the cartridge when not in use. If using the respirator for escape, replace cartridges after each escape. Once the user breathes through the respirator in a contaminated atmosphere, the cartridges may not provide adequate protection for additional escapes. Additionally, once the cartridges are initially placed into service or carried by the user in anticipation of escape, they must be replaced based on an appropriate cartridge change-out schedule. Extended exposure of the cartridges to nuisance levels (below the PEL) of the contaminant may prevent the cartridges from providing adequate escape protection.
6. For respirators with combination cartridges (chemical cartridges with filters): The limitations specified above for chemical cartridges as well as the applicable filter class apply for combination cartridges.
7. Applicable respirator use requirements as specified in the OSHA Respiratory Protection Regulation 29 CFR Part 1910.134 (or other requirements established by the Regulatory Agency with jurisdiction over the wearer). Additional OSHA

RESPIRATOR FIT TEST

Regulations may also apply for certain contaminants (See MSA's Response Respirator Selector).

EXPOSURE LIMITS

A listing of acceptable exposure limits from the following sources is provided in MSA's *Response® Respirator Selector*:

- American Conference of Governmental Industrial Hygienists (ACGIH)
- Occupational Safety and Health Administration (OSHA)
- National Institute for Occupational Safety and Health (NIOSH)
- American Industrial Hygiene Association (AIHA)

EXPOSURE LIMITS FOR MIXTURES

NIOSH allows this respirator to be used for protection against a mixture of contaminants that are present simultaneously or used alternately against one contaminant then another (using the same cartridges or filters) if the mixture meets the following conditions:

- a. The cartridge/filter must be approved for all contaminants present.
- b. Contaminants present simultaneously must be below IDLH levels for the specific contaminants. If any one contaminant in the mixture exceeds the IDLH concentration, then the entire mixture must be treated as IDLH and the respirator cannot be used

(except for escape from particulates with appropriate filter).

The American Conference of Governmental Industrial Hygienists (ACGIH) publishes the following information to determine the TLV of a mixture (T Mixture).

First determine the total concentration of the chemical mixture (C_{Mixture}) from the individual contaminant concentrations (C_1, C_2, C_3, \dots) using the following formula:

$$C_{\text{Mixture}} = C_1 + C_2 + C_3 + \dots$$

The TLV of the mixture is found by using the following formula where T_1, T_2, T_3, \dots are the individual contaminant TLVs and C_1, C_2, C_3, \dots are the individual contaminant concentrations (T Mixture).

$$T_{\text{Mixture}} = \frac{C_{\text{Mixture}}}{\frac{C_1}{T_1} + \frac{C_2}{T_2} + \frac{C_3}{T_3} + \dots}$$

Only use these equations if the contaminants present are actually mixed. Some substances do not mix and may be present separately, for example, in pockets or at different levels. In that case, the lowest TLV of the substances present must be used to determine the appropriate respirator category for protection against all contaminants present. See MSA's *Response Respirator Selector* for additional information.

PREPARATIONS FOR USE

RESPIRATOR FIT TEST

A qualitative or quantitative respirator fit test must be carried out for each wearer of this respirator to determine the amount of protection it will provide.

Respirator fit tests are explained fully in the *American National Standard for Respiratory Protection*, ANSI Z88.2, which is published by the American National Standards Institute, 11 West 42nd Street, New York, New York, 10036.

Quantitative Test - If a Quantitative Fit Test is used, a fit factor that is at least 1000 shall be obtained before that respirator is assigned to an individual.

Qualitative Test - If a Qualitative Fit Test is used, only validated protocols are acceptable. The individual must pass a test designed to assess a fit factor of at least 1000.

Regardless of facial dimensions and respirator sizing charts, respirator fit testing, either qualitative or quantitative must be performed to ensure the respirator selected provides an adequate fit.

WARNING

The user must perform a respirator fit test and follow all warnings and limitations specified. Failure to do so can result in serious personal injury or death.

PREPARATIONS FOR USE

The following inspection points must be checked before donning the respirator. A respirator that fails the inspection must not be used. The respirator must be repaired or replaced.

1. **Headbands:** Check to see that the headbands still have their elasticity. Inspect for cracks or tears and make sure all buckles are in place and working properly.
2. **Facepiece:** Check facepiece for dirt, cracks, tears or holes. Inspect the shape of the facepiece for possible distortion that may occur from improper storage and make sure the rubber is flexible, not stiff.
3. **Inhalation and exhalation valves:** Check for cracks, tears, distortion, dirt or build-up of material between valve and valve seat.
4. **Cartridge receptacle(s):** Check to make sure gaskets are in place and check for cracks and damage to bayonets.
5. **Cartridges and/or filters:** Make sure cartridges and filters are clean. Never try to clean a filter or cartridge by washing it or using compressed air. Inspect cartridges for dents, scratches or other damage, particularly the sealing bead around the bottom.

Note: If flexi-filters were used in an application that produces sparks, ensure that the filter surface is free of burn marks or holes.

6. **Adapter connector O Ring:** Inspect seal ring on adapter housing. If Damaged, replace.

DONNING

CAUTION

When using the Ultra Elite Facepiece, **DO NOT** use the Nosecup assembly with this Respirator configuration. Otherwise, High breathing Resistance may result. To reduce the possibility of lens fogging, use the Baffle (p/n 809574) instead of a nosecup assembly.

ATTACHING ADAPTER TO FACEPIECE FOR THE 1/4 TURN ADAPTER (P/N 10029823) AND SLIDE ADAPTER (P/N 10032511)

Turn the adapter handwheel counter-clockwise until it stops. Hold the handwheel in this position and push the adapter into the facepiece inlet until it stops. Release the handwheel and ensure that the handwheel returns to a fully clockwise position and that the facepiece bayonet is fully engaged by the adapter handwheel. Pull gently on the Adapter to ensure it is securely fastened to the Facepiece.

PUSH-TO-CONNECT ADAPTER (P/N 10040052)

Rotate the Adapter until adapter is horizontal to the facepiece. Push the Adapter straight into the facepiece adapter inlet.

Note: The slide lock will click when the adapter is fully engaged in the facepiece.

Pull gently on the Adapter to ensure it is securely fastened to the facepiece.

ATTACHING CARTRIDGE/FILTER

Carefully attach the cartridge/filter to the adapter bayonet connectors by first aligning the cutouts on the cartridge/filter with the lugs on the bayonet connectors. Make sure the small lug on the bayonet aligns with the small cutout on the cartridge/filter. Push down and turn the cartridge/filter clock-wise by hand until the stops are engaged.

To attach a filter to a chemical cartridge, place a new filter in each filter cover and snap the cover onto the cartridge body.

Note: If only a single Millenium canister is used, the other bayonet port must be fitted with the Inlet Cap (P/N 813341).

DONNING THE RESPIRATOR

WARNING

Do not wear eyeglasses under the facepiece. The temples or sidebars on eye glasses will prevent an airtight seal. If you must wear glasses, install the spectacle kit. Failure to follow this precaution can cause inhalation of contaminated air, resulting in serious respiratory injury or death.

1. Loosen the harness head straps on the facepiece so the end-tabs are at the buckles.
2. Hold the facepiece by the straps and put your chin in first.
3. Then, pull the harness back over

CLEANING AND DISINFECTING

- your head.
4. Tighten the lower (neck) harness straps first, by pulling them straight back, not out. Tighten the temple straps the same way. Tuck in the ends of the straps so that they lay flat across the head.
 5. Push headband pad towards neck and repeat Step 4. If necessary, tighten the front strap for best visibility and fit. Tuck in the ends of the straps so they lay flat across the head.

TEST FOR TIGHTNESS BEFORE EACH USE

The respirator must be subjected to the Tightness Test before each use by the following Method:

Negative Pressure Method — Place your palms over the cartridges lightly. Gently inhale so that the facepiece collapses slightly and hold your breath. The facepiece will remain collapsed while the breath is held unless there is a leak in the seal.

If any leakage is detected around the facial seal, readjust head harness straps and repeat the test until there is no leakage. If other than facial seal leakage is detected, investigate and correct the condition before testing again. The respirator must pass the tightness tests above before the respirator is used. The respirator will not furnish protection unless all inhaled air is drawn through suitable cartridges.

WARNING

DO NOT enter any atmosphere with this respirator unless you know that:

1. You have read, understood and followed all instructions and warnings pertaining to the respirator.
2. The respirator and conditions meet the requirements outlined.
3. The cartridges/filters are the proper type for the contaminant or contaminants present.
4. The amount of oxygen is sufficient to support life (that is, at least 19.5 percent oxygen by volume at sea level). Do not use if an oxygen concentration sufficient to support life is questionable.
5. Respirator does not leak (see Test for Tightness).
6. Cartridges/filters do not need to be replaced. Discard exhausted cartridges.
7. You are not color blind and can distinguish between the beginning and ending colors of the service life indicator (when using the Mersorb-P100 respirators only).

Failure to follow the above warnings can result in serious personal injury or death.

Note: Return to an uncontaminated area before removing the respirator. Check that the respirator and your clothing are free from contaminant before removing the respirator.

To remove the facepiece

1. Push the bottom buckles forward to loosen and fully extend the bot-

CLEANING AND DISINFECTING

tom straps.

2. Insert thumbs under the bottom harness straps. Pull it up and away from face.

REMOVE THE ADAPTER FROM THE FACEPIECE FOR THE 1/4 TURN ADAPTER (P/N 10029823) AND SLIDE ADAPTER (P/N 10032511)

Turn the adapter handwheel counter-clockwise until it stops. Hold the handwheel in this position and pull the adapter out of the facepiece.

PUSH-TO-CONNECT ADAPTER (P/N 10040052)

1. Push on the Adapter Slide lock.
2. Remove the Adapter from face piece

To replace cartridges/filters:

1. Remove the expended cartridges and dispose of properly.
2. Remove the replacement cartridges from storage bags.
3. Place cartridges on connectors (bayonets) carefully. (See Attaching Cartridge/Filters section).

To replace Filters:

1. Remove the filter covers and dispose of filters properly.
2. Place a new filter in each filter cover. Never load filters into the receptacles.
3. Replace filter covers taking care not to damage the filters.

CLEANING AND DISINFECTING

Respirators should be cleaned and disinfected after each use. MSA recommends using Confidence Plus™ Cleaning Solution. It is a germicidal cleaner that cleans and disinfects in one operation. It retains its germicidal efficiency in hard water to inhibit the growth of bacteria. It will not deteriorate rubber, plastic, glass, or metal parts. Refer to the label for use instructions. A solution as effective as Confidence Plus™ Cleaning Solution and compatible with MSA respirator components may be substituted.

CAUTION

DO NOT use Alcohol because it may deteriorate rubber parts.

1. Preparing the cleaner.
 - a. Follow the instructions with the Confidence Plus™ Cleaning Solution
 - b. If the Confidence Plus™ Cleaning Solution is not used, prepare in accordance with the instructions provided with cleaning products.

CAUTION

If not rinsed thoroughly, cleaning agent residue may irritate the wearer's skin.

CAUTION

Do not force-dry the parts by placing them in a heater or direct sunlight. This will cause the rubber to deteriorate.

MAINTENANCE

2. If the facepiece and adapter are to be cleaned, remove the cartridges/filters and adapter. The facepiece and adapter should be cleaned and disinfected after every use with MSA Confidence Plus® Cleaning Solution (P/N 10009971). Rinse thoroughly in plain warm water (110°F to avoid possible overheating and distortion of parts) and then air dry. ANSI suggests that users should be trained in cleaning procedure.

CAUTION

Cleaning and Disinfecting at or below 110°F temperature will avoid possible overheating and distortion of parts, which would require replacement.

MAINTENANCE / REPAIR

This respirator must be kept in good condition to function properly. When any respirator shows evidence of excessive wear or damage, it must be replaced immediately. Refer to the Preparations for Donning section for proper inspection of the respirator. This respirator, when not in use, should be stored in a clean dry location, such as its storage bag. Do not distort the facepiece during storage. When disposing of the respirator or its components, do so in accordance with local, state and federal regulations.

For repair or replacement of facepiece components refer to the instructions in the User Maintenance Manual.

Note: All repair procedures assume that the adapter is clean of contaminants and that the cartridges/filters have been removed and that the adapter has been removed from the facepiece.

Exhalation Valve:

- Remove cover from the exhalation valve. Pull valve out of exhalation valve housing.
- Install new exhalation valve. Press valve stem into valve exhalation seat. Lift gently to ensure valve is fully seated in exhalation seat.
- Press exhalation valve cover over onto exhalation seat.

Inhalation Valve:

- Line up hole in valve with the post on the back of bayonet connector and gently stretch the valve opening to slip over the post.

Bayonet Connector O-Rings:

- Remove the o-ring from bayonet connector groove.
- Roll new o-ring into groove. Ensure o-ring are seated in groove.

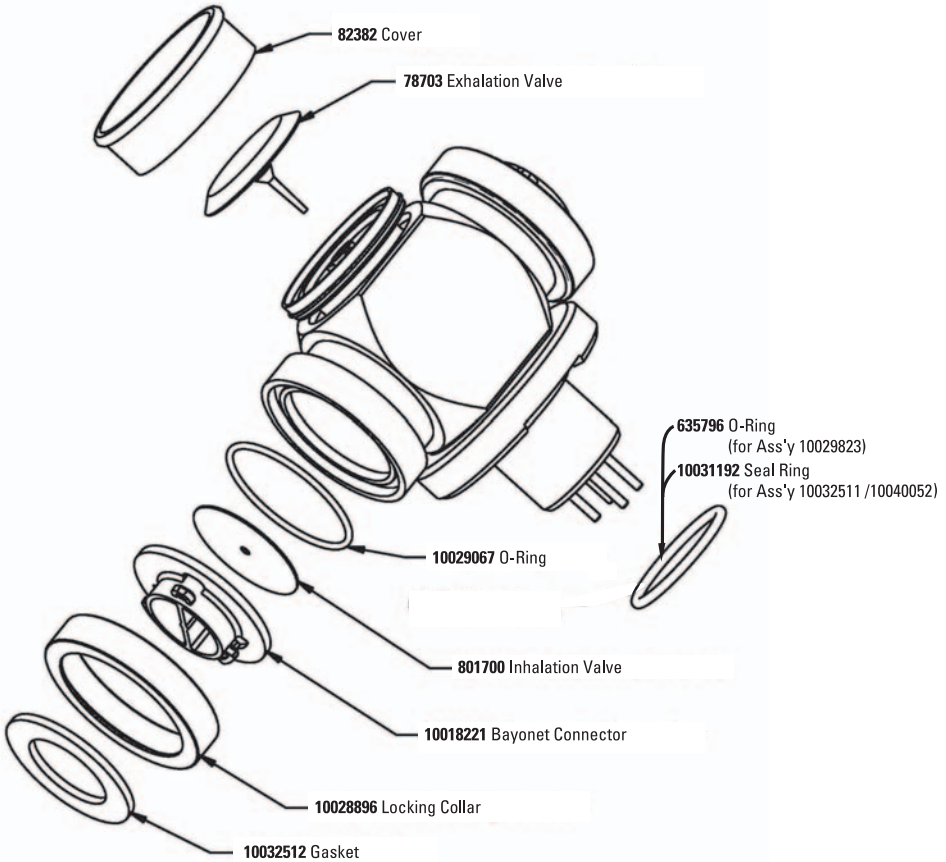
Install Bayonet Connectors:

- Insert bayonet connector into groove with tabs facing out.
- Thread retaining ring onto adapter housing, handtight.

Adapter Connector O-Ring:

- Roll o-ring out of groove and up connector.
- Roll new o-ring down connector into groove. Ensure o-ring is seated in groove.

APR Adapter (for 1/4 Turn inlet) P/N 10029823
APR Adapter (for Firehawk Slide Inlet) P/N 10032511
APR Adapter (for FireHawk Push-to-Connect Inlet)
P/N 10040052



INTRODUCTION

