OptimAir® 6A

INSTRUCTIONS

Powered Air-Purifying Respirator

⚠ WARNING

THIS MANUAL, INCLUDING THE WARNINGS AND CAUTIONS INSIDE, MUST BE READ AND FOLLOWED CAREFULLY BY ALL PERSONS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. These respirators will perform as designed only if they are used and serviced according to the instructions. OTHERWISE, THEY COULD FAIL TO PERFORM AS DESIGNED, AND PERSONS WHO RELY ON THESE RESPIRATORS COULD SUSTAIN SERIOUS PERSONAL INJURY OR DEATH.

The warranties made by MSA with respect to the product are voided if the product is not used and serviced according to the instructions in this manual. For any additional information relative to use or repair, write or call 1-800-MSA-2222 during regular working hours.

See separate insert for NIOSH approval information (P/N 816882).

MSA Safety Products Division • ISO 9001 CERTIFIED Quality System • MSA Instrument Division

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
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INTRODUCTION

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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 (IDLH).
C. Do not exceed maximum use concentrations established by regulatory standards.
H. Follow established cartridge and canister change schedules or observe the End-of-Service-Life Indicator (ESLI) to ensure that cartridges and canisters are replaced before breakthrough occurs.
J. Failure to properly use and maintain this product could result in injury or death.
K. The Occupational Safety and Health Administration regulations require gas-proof goggles be worn with this respirator when used against formaldehyde.
L. Follow the manufacturer's User's Instructions for changing cartridges and/or filters.
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.

Protection

HE - High Efficiency Particulate Air Filter for powered, air-purifying respirators.
AM - Ammonia
CS - Chlorobenzylidene malononitrile
CN - Chloroacetophenone
CD - Chlorine dioxide (escape)
CL - Chlorine
FM - Formaldehyde
HC - Hydrogen chloride
HF - Hydrogen fluoride
HS - Hydrogen sulfide (escape)
MA - Methylamine
MV - Mercury vapor
OV - Organic Vapor
SD - Sulfur dioxide
SA - Supplied Air

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 the respirator, cartridges, facepiece or indicator. If you cannot 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).

INTRODUCTION

INSTRUCTIONS FOR USE AND CARE BY PROPERLY TRAINED AND QUALIFIED PERSONNEL

⚠ WARNING

1. **This device does NOT supply oxygen. Use only in adequately ventilated areas containing at least 19.5 percent oxygen.**
2. **This respirator must be used in conjunction with proper 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). (See the respirator NIOSH approval plate P/N 816882 to determine if this device can be used for escape from those concentrations.)**
4. **Do not use when appropriate exposure limit (OSHA, PEL, NIOSH REL, ACGIH TLV, etc) is not known or when it is below the odor threshold or any other established warning level for the contaminant.**
5. **Leave area immediately if:**
   a. **Breathing becomes difficult.**
   b. **Dizziness or other distress occurs.**
   c. **You taste or smell the contaminant.**
   d. **You experience eye, nose or throat irritation.**
6. **Use strictly in accordance with instructions, labels, and limitations pertaining to this device.**
7. **This device may not seal properly if beards, sideburns, or other similar physical characteristics prevent direct contact between the skin and the sealing surface of the facepiece (see NFPA-1500 and ANSI 788.2). Do not use this device if such conditions exist.**
8. **The face-to-facepiece seal must be tested before each use.**
9. **Never remove the facepiece except in a safe, non-hazardous, non-toxic atmosphere.**
10. **Never alter or modify this device.**
11. **This respirator is for use by training, 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. Failure to follow this warning can result in serious personal injury or death.

RESPIRATOR USE LIMITATIONS

The respirator must not be worn in atmospheres which exceed any of the following limitations:

1. Maximum use concentrations
   a. Full facepiece and hood PAPRs: 1000 times the exposure limit for the contaminants present.
   b. Half-facepiece PAPRs: 50 times the exposure limit for the contaminants present.
   c. 1000 parts per million organic vapors (for organic vapor respirators).
2. The limitations outlined in the applicable NIOSH approval.
3. Any applicable limitation contained in a standard established by a regulatory agency (such as OSHA) with jurisdiction over the wearer.
4. Do not use for respiratory protection against the following contaminants regardless of concentration or time of exposure. This far-from-complete list is offered only as a guide to proper evaluation of the many contaminants found in industry. Contact MSA for further information on other specific material.

Acrolein
Aniline
Arsine
Bromine
Carbon monoxide
Diisocyanates
Dimethylaniline
Dimethyl sulfate
Hydrogen cyanide
Hydrogen selenide
Methanol
Methyl bromide
Methyl chloride
Methylene chloride
Nickel carbonyl
Nitric Acid
Nitro compounds:
  Nitrogen oxides
  Nitroglycerin
  Nitromethane
Ozone
Phosgene
Phosphine
Phosphorous trichloride
Stibine
Sulfur chloride
Urethane or other diisocyanate-containing paints
Vinyl chloride

5. This respirator can be used for protection against a mixture of contaminants that are present simultaneously or alternately against one contaminant then another (using the same cartridges or filters) if the mixture meets the following conditions:
   a. The cartridge/canister/filter must be approved for all contaminants present.
   b. Particulates (dusts, mists, fumes, asbestos, radionuclides) can be mixed with any other particulate or any gas or vapor for which the cartridge/canister is approved.
   c. 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).

INTRODUCTION

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)

Contact MSA at 1-800-MSA-2222 for information.

Exposure Limits for Mixtures
The American Conference of Governmental Industrial Hygienists (ACGIH) publishes the following information to determine the TLV of a mixture.

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

$$C_{Mixture}=C_1+C_2+C_3+\ldots$$

The TLV of the mixture is found by using the following formula where T_1, T_2, T_3, . . . are the individual contaminant TLVs and C_1, C_2, C_3, . . . are the individual contaminant concentrations:

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

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.

RESPIRATOR FIT TESTS

A qualitative or quantitative respirator fit test should 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 Fit Test
If a quantitative fit test is used, a fit factor that is at least 100 shall be obtained before that respirator is assigned to an individual.

Qualitative Fit Test
If a qualitative test is used, only validated protocols are acceptable. The individual must pass a test designed to assess a fit factor of 100.

Powered Air-Purifying Respirators (PAPR) should be qualitatively or quantitatively fit tested in a negative-pressure mode (with blower off). This will cover use of the respirator in the powered air-purifying mode of operation.

IMPORTANT INFORMATION CONCERNING THE RESPIRATORY PROTECTION PROGRAM

1. An adequate respiratory protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance. [See OSHA regulations, Title 29 CFR, Part 1910.134].
2. This respirator will perform as designed only if used and maintained according to the manufacturer's instructions. The Program Administrator and the users must read and understand these instructions before trying to use or service this product. MSA encourages its customers to write or call for a demonstration or any additional information on this product before using it.

DESCRIPTION

DESCRIPTION

The OptimAir 6A Powered Air-Purifying Respirator (PAPR) is certified by the National Institute for Occupational Safety and Health (NIOSH) as an air-purifying device designed for use in atmospheres which are **NOT** immediately dangerous to life or health (IDLH).

Five models are available:

- OptimAir 6A PAPR with high-efficiency particulate filter cartridges
- OptimAir 6A PAPR with chemical cartridges
- OptimAir 6A PAPR with combination cartridges
- OptimAir 6A PAPR with CS/CN canisters
- Advantage 3000 (Model 3100) full facepiece

The OptimAir 6A Particulate Filter Cartridge PAPR may be used with the Comfo half-facepiece, Comfo Welder's half-facepiece, Comfo Elite half-facepiece, Comfo Elite Welder's half-facepiece, Ultravue full facepiece, Ultra Elite full facepiece, Advantage 1000 full facepiece, Millennium full facepiece, Advantage 3000 (Model 3100) full facepiece, Tyvek, Saranex, or the Tychem QC Hoods.

The OptimAir 6A Chemical Cartridge PAPR may be used with the Ultravue full facepiece, Ultra Elite full facepiece, Advantage 1000 full facepiece, Millennium full facepiece, Advantage 3000 (Model 3100) full facepiece, or Comfo-style half-facepieces only.

The OptimAir 6A Combination Cartridge PAPR may be used with the Ultravue full facepiece, Ultra Elite full facepiece, Advantage 1000 full facepiece, Millennium full facepiece, Advantage 3000 (Model 3100) full facepiece, or Comfo-style half-facepieces only.

The OptimAir 6A CS/CN canister may be used with the Millennium® or Advantage® 1000 facepieces only.

Note: When the Advantage 1000 Facepiece is used, the P/N 10012413 kit and P/N 96547 adapter must be installed on the facepiece.

Note: When Millennium Facepiece is used, the P/N 96547 adapter must be installed on the facepiece.

COMBINATION CARTRIDGES

A combination cartridge consists of particulate filter media and chemical sorbent in one cartridge package. This type of cartridge must be used when harmful particulate matter as well as harmful gases and/or vapors are present.

⚠ WARNING

DO NOT use combination cartridges with a PAPR hood. Combination cartridges are approved for use with the Ultravue or Ultra Elite full facepieces or Comfo-style half-facepieces only. Failure to follow this warning can result in serious personal injury or death.

CS/CN CANISTER

A CS/CN canister consists of particulate filter media and chemical sorbent in one canister package. This type of canister must be used when the CS/CN is present.

⚠ WARNING

CS/CN canisters are approved for use only with Advantage 1000 or Millennium full facepieces. Failure to follow this warning can result in serious personal injury or death.

The Ultravue Facepiece and Ultra Elite Facepiece are available with an integral welder's lens and are available for use with the welder's adapter. All facepieces are available in small, medium, or large. Rubber or silicone material may be selected.

The motor-blower, battery pack, and filters are worn as an assembly on the support belt. The breathing tube connects the belt-mounted assembly to the facepiece or hood.

The respirator may be used at temperatures between 0° and 120°F, and may be worn under flame-retardant garments. If used below 40°F, a fully-charged NiCad Battery may not operate the motor-blower for a shift.

PRINCIPLE OF OPERATION

The motor-blower draws surrounding air through cartridges or canisters which capture the contaminants. Purified air passes through the breathing tube to the facepiece or hood. Air pressure in the facepiece or hood is higher than the surrounding air. This means that if a small leak occurs, air will flow from inside the facepiece or hood to the outside air. This is referred to as positive pressure. Air flow also provides wearer comfort.

The OptimAir 6A PAPR is powered by a Nickel-Cadmium (NiCad) or Lithium Battery Pack. The NiCad Battery Pack **only** is rechargeable. The Lithium battery is **NOT** rechargeable. However, the Lithium Battery has a very long shelf life (up to 10 years).

The rechargeable Nickel-Cadmium Battery Pack and the single-use Lithium Battery supplies 4.5 volts to the motor-blower. The battery pack is replaceable. A fully-charged NiCad Battery and a fresh Lithium Battery are designed to operate for a shift. The battery pack is compatible with both the standard and dual-rate (fast-rate) chargers.

DESCRIPTION

All NiCad Packs are equipped with a thermistor and control jack so that they may be used with the dual-rate charger.

⚠ WARNING

DO NOT recharge a Lithium Battery. The Lithium Battery can explode. Failure to follow this warning can result in serious personal injury or death.

UNPACKING AND INSPECTION

UNPACKING AND INSPECTION

The PAPR consists of the following components:
- facepiece or hood
- motor-blower and battery pack as a single assembly
- breathing tube
- polyurethane-coated support belt
- charger (for NiCad Battery **only**.)

⚠ CAUTION

Thoroughly inspect all components of the respirator before the device is used. Read and observe all NIOSH approval limitations as they apply to using the PAPR.

1. Remove the facepiece (or hood), breathing tube, battery charger, and support belt from the box. Check for signs of shipping damage.
2. Remove the motor-blower and battery pack, and the two filters if included. Check for shipping damage.

⚠ CAUTION

DO NOT drop the PAPR. The case can be damaged by impact. The blower can be loosened or the motor shaft can be bent. If the unit is dropped, check the case for cracks. Listen closely to the sound of the motor. If the blower sticks or rattles, or if air output is reduced, the entire motor-blower must be returned to MSA or an authorized MSA Service Center for repair.

REMOVING AND INSTALLING PARTICULATE, COMBINATION CARTRIDGES, AND CS/CN CANISTERS

1. Before charging the NiCad Battery Pack, unthread and remove the cartridges. Then separate the pack from the motor-blower.

2. Look to see that the gaskets located in each cartridge receptacle on the motor-blower are in place.

⚠ WARNING

DO NOT install the filter, chemical cartridges, CS/CN canisters, or use the respirator if the gaskets are missing or appear damaged. If you do, the contaminant can be drawn into the respirator and inhaled, resulting in serious respiratory injury or death.

3. Hold the PAPR in one hand.
4. Use your other hand to turn the cartridge/canister clockwise and thread it down onto the sealing gasket. Hand-tighten the cartridge/canister.
5. Repeat steps 2 through 4 to install the other cartridge/canister.

REPLACING THE CS/CN CANISTER

Use the canister immediately upon opening the bag. Discard canister after each use. Do not exceed maximum concentration and service life specified by governing protocol. The length of time the chemicals in the canister will give protection depends on the concentration of the contaminant(s) and the rate of breathing. When the mask is adjusted properly, the wearer should not taste or smell the contaminant or experience eye, nose, or throat irritation. The wearer's inhalation resistance should be as experienced during training.

Return to fresh air immediately and attach a new canister if you taste or smell the contaminant, experience eye, nose, or throat irritation, or excessive inhalation resistance. Do not use the canister after the expiration date on the label.

NICKEL CADMIUM BATTERY PACKS

Battery Changing

The battery pack must be fully-charged for 16 hours (8 hours with a dual-rate charger) before the respirator is first used. Use the standard charger (P/N 463471), dual rate charger (P/N 486614), or other recommended charger from MSA only. Other chargers may damage the battery due to internal wiring differences or incorrect charging rates.

⚠ WARNING

DO NOT recharge a Lithium Battery. The Lithium Battery can explode. Failure to follow this warning can result in serious personal injury or death.

Note: Unthread and remove the filters, then separate the pack from the motor-blower.

1. Separating the battery pack from the motor-blower.
   a. Be sure that the power switch is in the off position.
   b. Hold the motor-blower in one hand.

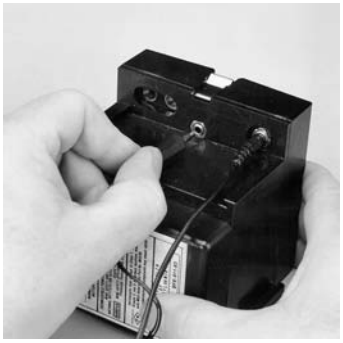
   c. Use the index finger of your other hand to pull the metal catch down toward the MSA logo on the front of the battery pack. Pull the battery pack straight up.

⚠ WARNING

DO NOT charge the battery pack where there are explosive concentrations of combustible gases, vapors, or mists. An explosion or fire can result. Replace the charger if the cord is damaged or worn, or if the case is cracked or distorted. Do not use a damaged charger. Doing so can result in serious personal injury or death, or create a fire hazard.

2. Charging the battery pack

a. Push the charging plug into the charging jack. Be sure that the plug is all the way in.



Note: To use the dual-rate charger, insert the charging plug in the charging jack as usual. Then insert the male control plug into the center jack in the battery pack.

b. Plug the charger into a 115-120V, 60 Hz (standard AC) outlet.

⚠ WARNING

Voltages lower than 110V are not recommended. Voltages greater than 120V will damage the battery charger and battery pack. Limit the charging time to 24 hours maximum with the standard charger. Timer-controlled outlets may be used. Do not charge the battery pack for more than 24 hours with the standard charger. Over-charging seriously reduces battery life, and could create an explosion hazard, resulting in serious personal injury or death.

c. Charge the battery pack a minimum of 16 hours (8 hours for dual-rate).

Note: Do not charge partially-discharged battery packs at the full-charge rate, which increases temperature substantially. Repeated charging in this manner reduces service life. If the standard charger is used, charge at 200% of pack use-time (e.g., a pack used 2 hours is charged 4 hours). Charging based on use time returns the pack to full capacity without increasing temperature. If this method is not practical, use the dual-rate charger.

d. The battery pack can be stored for long periods at room temperature. However, several cycles (charging followed by discharge) may be needed to restore the pack to full capacity. If the pack has been stored in a "charge-ready" condition, it should be charged for 6 hours every 30 days to maintain a capacity of 70% or greater.

e. The standard charger uses a one light emitting diode (LED). The LED shows that proper voltage is present. The chart below shows how to "read" charger and battery performance for the dual-rate charger (P/N 486614).

Voltage	Current	Indication
ON*	ON	Good pack; accepting charge.
OFF	ON	Bad pack; current flowing but low battery voltage; replace pack.
ON	OFF	Open circuit or bad pack; check that charging plug is clean and fully inserted in jack; internal battery open circuit; return battery pack to MSA.
OFF	OFF	No power or bad pack; check that charger is plugged in (120 VAC); check cable to battery-pack.

*Allow at least 20 minutes for the light to come on if you are charging a severely-discharged battery pack.

3. Re-attaching the battery pack

a. Line up the dovetail on the battery pack with the dovetail on the motor-blower.

b. Slide the battery pack and the motor-blower together until the spring clip snaps into place.

c. Check for gaskets in the filter or chemical cartridge receptacles and re-install the cartridges.

LITHIUM BATTERY PACKS

Lithium Battery Packs maintain over 85% of their original charge for up to 10 years. This battery pack is a single-use battery which will last for a shift under normal conditions. When the pack reaches the end of its life, dispose of it according to appropriate disposal procedures.

⚠ WARNING

DO NOT recharge a Lithium Battery. The Lithium Battery can explode. Failure to follow this warning can result in serious personal injury or death.

ASSEMBLING THE SUPPORT BELT TO THE MOTOR-BLOWER

Slip the support belt through the belt loop on the motor-blower.

DONNING

DONNING THE FACEPIECE STYLE PAPR

Note: *Tyvek/Saranex/Tychem QC Hoods PAPRs are covered separately. See Tyvek/Saranex/Tychem QC Hoods Assembly. Tyvek is trademark of the duPont Company.

⚠ WARNING

DO NOT wear this respirator unless you have received training in its use and have read and understood all of the instructions.

DO NOT use this respirator in an area that has less than 19.5 percent oxygen. The PAPR does not supply oxygen. Do not use the respirator as an underwater device. Do not use the respirator if the air contaminant is unknown, immediately dangerous to life or health (IDLH), or you cannot escape without respiratory equipment. Do not use the respirator when the appropriate exposure limit (OSHA PEL, NIOSH REL, ACGIH TLV, etc) is not known or when it is below the odor threshold or any other established warning level for the contaminant.

Respirator cartridges/canisters are designed to provide limited protection from specific contaminants. See the filter, chemical, combination cartridge, or CS/CN canister label for specific information.

If you are working with a contaminant which can be absorbed by your skin, wear protective clothing that will not allow the contaminant to contact your skin.

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

DONNING THE SUPPORT BELT

Don the support belt and adjust the motor-blower and cartridges to a comfortable position.

The PAPR may be worn on either side. If a Comfo Welder's Facepiece is used, the PAPR must be worn toward the back or on the left side so that the breathing tube will reach.

DONNING THE FACEPIECE

Note: Check for a gasket in the facepiece coupling nut so that it will seal with the breathing tube.

1. Connect the breathing tube to the facepiece and hand-tighten.
2. Donning the half-mask facepiece with cradle headstraps:
   a. Slip the cradle headstrap over the crown of your head and rest the top of the facepiece on the bridge of your nose.
   b. Swing the bottom of the facepiece under your chin.
   c. Pull the lower headstraps around your neck and attach the clip to the d-ring.
   d. Adjust the tension slides for a comfortable fit.

   e. Perform the Air-Tightness Test.
3. Donning the half-mask facepiece with elastic headstraps:
   a. Rest the top of the facepiece on the bridge of your nose.
   b. Swing the bottom of the facepiece under your chin.
   c. Place the long headstraps over the crown of your head. Attach the clip to the d-ring. Place the short headstraps around your neck and attach the clip to the d-ring.
   d. Adjust the tension slides for a comfortable fit.
   e. Perform the Air-Tightness Test.
4. Donning the full facepiece.

⚠ CAUTION

Cover lenses are installed on the outside of the lens to protect the plastic surface. Do not use a cover lens in a high heat environment. High heat can cause the cover lens to distort or moisture can get trapped between the cover lens and the facepiece lens resulting in condensation, which can cause distorted vision.

ULTRAVUE AND ULTRA ELITE WITH ADJUSTABLE RUBBER HARNESS

1. Adjust the facepiece headstraps so the end tabs are at the buckles.
2. Grip the facepiece between the thumb and fingers with both hands. Insert your chin into the chin cup.
3. Pull the facepiece headstraps over your head. Smooth the straps flat against your head.
4. Support the facepiece by holding the speaking diaphragm housing with one hand.
5. To tighten the lower (neck) straps, pull the straps straight back, not out.
6. Tighten the side (temple) straps.
7. Adjust the forehead strap if needed to position the lens for best vision.
8. Perform the Air-Tightness Test.

DONNING

Note: A nosecup accessory is available to reduce lens fogging. If the respirator will be used in areas of high humidity or at temperatures below 32°F, the nosecup accessory may be installed.

⚠ WARNING

DO NOT wear eyeglasses with a full facepiece. The temples or sidebars on eyeglasses will prevent an air-tight seal. If you must wear glasses, install the spectacle kit. Failure to follow this warning may cause inhalation of contaminated air resulting in serious personal injury or death.

DONNING ADVANTAGE 3000(MODEL 3100) RESPIRATOR WITH ADJUSTABLE RUBBER HARNESS

1. The mask may need to be initially donned more than once to determine the correct adjustment of top straps and obtain a proper fit.
2. Verify top straps are evenly located and loosen the two bottom straps. Grip the straps by inserting thumbs through the straps. Insert chin well into lower part of facepiece and pull harness back over head.
3. Push the back of the harness downward toward the neck until it is centered.
4. If necessary, hold the mask component housing with one hand and position the harness with other hand until obtaining a firm and comfortable fit against the face.
5. Tighten the two bottom straps so that the mask is snug against the face. The top straps should be flat against the top of the head.
6. If the mask does not feel snug against the face, remove the mask, adjust the top straps and go to step 2.

To Adjust the Top Straps:

1. Remove the mask. The top straps should be adjusted with the mask off.
2. Remove the strap from the fastener button, by pulling the loose end of the strap away from the fastener button.
3. Move the slide away from the lens ring to allow the strap to slide through the lens ring connection. Adjust the length of the strap. Pull the straps to the next hole. Secure the strap in position by pulling the strap onto the button.
4. Smooth the straps so that they are flat. Move the slide so that it is located at the lens ring connection.

DONNING THE RESPIRATOR WITH PLASTIC ADVANTAGE HARNESS

Note: There are two recommended donning procedures.

Donning Procedure A:

1. Completely loosen the two bottom straps. Spread the straps of the head harness with both hands and place chin into the mask. Pull harness over head all the way, until plastic cradle lies flat on back of head.
2. Tighten neck straps evenly so that the mask is snug against face.
3. If necessary, adjust the mask and tighten harness by pulling loop on the back of harness.

Donning Procedure B:

1. Completely loosen the two bottom straps, insert fingers and hold the loop on the back of the harness.
2. Place chin into the mask.
3. Pull harness over head with the loop; pull harness down to the back of the head, until plastic cradle lies flat on back of head.
4. Tighten neck straps evenly so that the mask is snug against your face.

FACEPIECE FIT CHECK
(Face-to-Facepiece Seal)

The Air-Tightness Test **must** be performed **each** time the facepiece is donned. You must know the face-to-facepiece seal is good **before** you enter any hazardous area.

1. Block off the breathing tube with either the palm of your hand or by placing your thumb over the opening inside the coupling nut.
2. Breathe in and hold your breath for 10 seconds. If the seal is good, the facepiece will collapse and remain collapsed against your face.
3. If the facepiece does not remain collapsed or if you notice any leakage, re-adjust the straps and test again. If this does not correct the leak, **do not** use the facepiece.
4. If you cannot get a seal by adjusting the headstraps, check the facepiece and breathing tube for leaks. Locate the problem and correct it before using the respirator.

⚠ WARNING

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. The face-to-facepiece seal must be tested before each use. DO NOT USE A FACEPIECE THAT DOES NOT SEAL. Failure to follow this warning can result in serious personal injury or death.

DONNING

FINAL HOOK-UP

1. Turn the power switch on. Let air flow through the motor-blower for a few seconds.

2. Check for an o-ring on the end of the breathing tube coupling nut.

⚠ WARNING

The o-ring must be present to ensure a proper air-tight seal. Failure to follow this warning can cause inhalation of the contaminant resulting in serious respiratory injury or death.

3. Thread the breathing tube onto the motor-blower and hand-tighten the coupling nut.

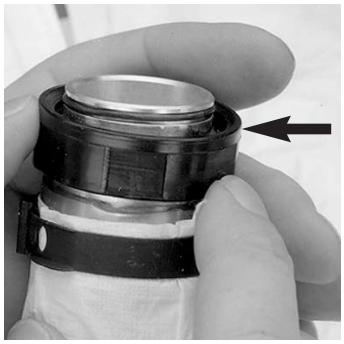
Note: If you are wearing a half-mask facepiece and feel air blowing out of the facepiece and into your eyes, the facepiece is not fitted properly. All air should escape through the exhalation valve. Don the facepiece again.

NOTES

TYVEK/SARANEX/TYCHEM QC HOODS

ASSEMBLING THE TYVEK/SARANEX/TYCHEM QC HOODS PAPR

1. Remove the suspension by pulling the Velcro strips apart, then pull the suspension out of the hood.



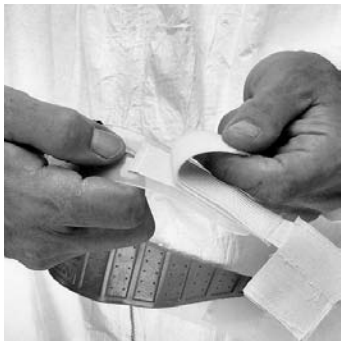
2. Check the end of the hood coupling nut for an o-ring.

⚠ CAUTION

The o-ring must be present to obtain an air-tight seal. Failure to follow this warning can cause inhalation of the contaminant resulting in serious respiratory injury or death.

3. Thread the breathing tube onto the hood. Hand-tighten the coupling nut.

ADJUSTING THE HOOD SUSPENSION



1. Loosen the Velcro strip at the back of the suspension by pulling the strip away from the plastic band.
2. Position the suspension so that the stitching on the sweatband is down.
3. Place the sweatband against your forehead and wrap the plastic band around your head for a snug but comfortable fit.

4. Press the Velcro strips together to secure the suspension.

INSTALLING THE HOOD SUSPENSION

Note: If the optional chin strap will be used, install it at this time. The chin strap must be attached to the hood suspension before the suspension is installed in the hood.

1. To install the chin strap, insert one end of the strap in the slot located at the side of the suspension. Then insert the remaining end of the strap in the slot on the other side.
2. Insert the suspension into the hood.
3. Turn the suspension so that the sweatband faces the hood lens.

4. Attach the three Velcro strips on the suspension to the three strips inside the hood.

INSTALLING AN OPTIONAL PROTECTIVE CAP

Note: If a protective cap is to be worn, it must be from MSA. Only the cap from MSA is equipped with proper adapters to secure the hood to the cap.

1. Adjust the cap suspension to the head size desired. Follow the instructions supplied with the cap.
2. Insert the cap into the hood.
3. Turn the cap so that the bill is pointed toward the hood lens.

4. Attach the Velcro strips in all three places.

TYVEK/SARANEX/TYCHEM QC HOODS

DONNING THE TYVEK/SARANEX/TYCHEM QC HOODS PAPR

⚠ WARNING

DO NOT wear this respirator unless you have received training in its use and have read all of the instructions.

DO NOT use this respirator in an area that has less than 19.5 percent oxygen. The PAPR does not supply oxygen. Do not use the respirator as an underwater device. Do not use the respirator in an atmosphere containing poisonous gases or vapors. Do not use the respirator if the air contaminant is unknown, immediately dangerous to life or health (IDLH), or you cannot escape without respiratory equipment. Respirator cartridges are designed to provide limited protection from specific contaminants. See the filter cartridge label for specific information.

If you are working with a contaminant which can be absorbed by your skin, wear protective clothing that will not allow the contaminant to contact your skin.

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

1. Don the support belt. Adjust the motor-blower and filter assembly to a comfortable position toward your back.
2. Check for an o-ring on the end of the breathing tube coupling nut.

⚠ WARNING

The o-ring must be present to ensure an air-tight seal. Failure to follow this warning can cause inhalation of the contaminant resulting in serious respiratory injury or death.

3. Thread the breathing tube onto the motor-blower and hand-tighten the coupling nut.
4. Turn the power switch on. Let air flow through the unit for a few seconds.
5. Grip the hood and knit collar between your fingers with both hands. Stretch the collar and pull the hood down over your head.
6. Put the suspension on your head.
7. Secure the chin strap (optional accessory) under your chin.
8. Straighten the knit collar for a good fit around your neck.
9. Check the hood inlet to make sure it is straight and not twisted.

⚠ WARNING

DO NOT wear the hood with the neck seal or bibs under your clothing. Failure to follow this warning can cause reduced air flow below the required minimums. This can reduce or eliminate the protection of the unit, resulting in serious personal injury or death.

RESPIRATOR USE

PARTICULATE FILTER AND CHEMICAL CARTRIDGE AND BATTERY PACK SERVICE TIMES

The PAPR high efficiency filter cartridges and the battery pack are designed to supply a minimum of six cubic feet per minute (cfm) of respirable air to the facepiece (or hood) for a shift. Actual service time may vary. However, air flow must not drop below 4 cfm for a facepiece or 6 cfm for hoods. The type and concentration of the contaminant, as well as the relative humidity of the air, may affect how long filters may be used. See the Accessories section for available flow check devices.

If the motor-blower changes speed quickly or varies as you breathe, check the following:

1. If breathing resistance is still high after you have installed new filters, then the NiCad Battery Pack must be recharged or replaced with a Lithium Battery Pack. See Battery Charging. With facepiece-equipped respirators you can breathe through the respirator with the motor-blower off. However, breathing resistance will be greater than when the PAPR is supplying air to the facepiece.

⚠ WARNING

DO NOT use the PAPR hood model with the motor-blower off. CO_2 can build up in the hood and cause asphyxiation. If motor-blower stops, immediately return to fresh air and remove hood.

CHEMICAL AND COMBINATION CARTRIDGE SERVICE TIMES

For respirators with Chemical Cartridge:

- 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 work 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.
- If using the respirator against substances having poor warning properties, over exposure can occur without user awareness. Take appropriate precaution to prevent over exposure, which may include an earlier cartridge change-out, or using an air-supplied respirator to SCBA. For further information refer to MSA's Response Respirator Selector.
- 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 desorption and migration through the cartridge when not in use.

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.

Applicable respirator use requirement as specified in the OSHA Respiratory Protection Regulations 29 CFR Part 1910.134 (or other requirements established by the Regulatory Agency with jurisdiction over the wearer). Regulations may also apply for certain contaminations (See MSA's Response Respirator Selector).

⚠ WARNING

Return to a safe atmosphere and discard the respirator immediately if the facepiece becomes discolored, crazed, blistered, cracked, or if other signs of deterioration of the facepiece or breathing tube are observed. Failure to follow this warning can result in serious personal injury or death.

In Case of Emergency, or if any of the following conditions exist, leave the area immediately:

- breathing becomes difficult
- dizziness or other distress occurs
- you taste or smell the contaminant
- you experience eye, nose or throat irritation.

REPLACING THE FILTER, CHEMICAL CARTRIDGES, OR CS/CN CANISTERS, AND THE BATTERY PACK

⚠ WARNING

Filters, chemical cartridges, and CS/CN canisters are not designed to be cleaned and then reused. Do not try to clean cartridges and canisters by hitting them against hard surfaces or by blowing compressed air through them. You could damage the inside of the cartridge or canister and eliminate respirator protection, resulting serious respiratory injury or death.

RESPIRATOR USE

⚠ WARNING

DO NOT remove filters, chemical cartridges, or CS/CN canisters in a contaminated area. Return to a safe atmosphere and clean any contaminant from the surface of the filters, cartridges, or canisters, the motor-blower, and the battery pack.

DO NOT remove the filters, chemical cartridges or CS/CN canisters while the motor-blower is running. With the filters, chemical cartridges ,or CS/CN canisters removed, contaminants shaken from the surfaces of the respirator will be drawn in through the air-intake holes in the motor-blower case and will be supplied directly to the breathing tube and facepiece.

Failure to follow this warning can cause inhalation of the contaminant and result in serious respiratory injury or death.

Note: You can breathe through the facepiece with the motor-blower off but breathing resistance will be greater than when the PAPR is on and supplying air to the facepiece.

1. To change filters, chemical cartridges, or CS/CN canisters, refer to Removing and Installing Particulate Chemical Combination Cartridges, and CS/CN Canisters.
2. To charge the NiCad Battery Pack, refer to Charging the NiCad Battery Pack.
3. To install a charged NiCad or fresh Lithium Battery Pack, refer to Reattaching the Battery Pack.

OTHER USES (NOT EVALUATED OR APPROVED BY NIOSH)

This PAPR, when used with the Riot Control Canister (P/N10012164) and either the Advantage 1000 or Millennium Facepiece, also is effective against the following chemical warfare (CW) agents, GA, GB (Sarin), GD, VX, Mustard and Lewisite and all biological agents. Although not evaluated or approved by NIOSH for this application, the gas mask and canisters have been tested by MSA and have met the requirements for effectiveness against CW agents using the test protocol recommended by the Chemical Agent Safety and Health Policy Action Committee (CASHPAC). This gas mask also has been tested by MSA and found to be effective against OC (Oleoresin Capsicum) Riot Control Agent and HCN (Hydrogen Cyanide). NIOSH has not evaluated or approved this for OC or HCN.

RESPIRATOR USE LIMITATIONS IN CBA (CHEMICAL-BIOLOGICAL WARFARE AGENT) ATMOSPHERES

The recommended work environments for this respirator include operations where exposure to vapor or liquid Chemical Agents or Biological Agents (CBA) is possible but not expected, for escape from possible CBA contamination and controlled low level CBA atmospheres, which do not exceed the maximum use concentration as determined by the governing authority.

In the event a maximum use concentration has not been established by the governing authority, MSA **recommends** that the use of the respirator should be limited to atmospheres 100 times (or less) the defined permissible Airborne Exposure Limit (AEL) or Time Weighted Average (TWA) of the contaminate (except for Mustard and Lewisite; for these agents the recommended use concentration is to be limited to the AEL or TWA).

⚠ WARNING

For uses in atmospheres containing chemical or biological warfare agents, as with all hazardous atmospheres, it is recommended that a complete respiratory and body protection program be developed and full protective ensemble be utilized. This program should as a minimum include the following items:

Before entering a CBA Contaminated Area

1. **All users should be trained (on a regular basis) in the use of the protective equipment, the hazard, the effects and physical signs of agent overexposure, governing protocols or regulations concerning the hazard, user medical needs emergency and first aid procedures in case of overexposure, decontamination, and handling and disposal of contaminated equipment.**
2. **Each user should be quantitatively fit tested in the facepiece they will be using and have a tested fit factor of 1000 or greater.**
3. **It is recommended that each user should be outfitted with a facepiece with CBA canister, a hood, and a full chemical protective suit including gloves and shoe coverings.**
4. **The user would determine or check with the safety office to verify that the protective equipment to be used is sufficient for exposure to their particular hazard and contamination level. Misuse of the protective equipment can result in serious personal injury or death.**

During the Stay in the CBA Contaminated Area

1. **It is recommended that the area be real timed monitored (with alarm) for exposure levels of the contaminate. If the monitored contaminate level is above the allowable exposure limit or maximum use concentration (as determined by the governing protocol), the user should leave the area immediately.**
2. **The user should not remove any of the CBA protective clothing while in the contaminated area. This action could result in a serious injury or death.**
3. **If symptoms of CBA overexposure are present, seek medical treatment and attention immediately.**

RESPIRATOR USE

After Exposure to a CBA Contaminated Area

1. **A decontamination procedure for the user and the protective equipment should be developed and implemented.**
2. **Once the user leaves the contaminated area, they should enter the decontamination area and follow the set decon procedure. Failure to follow an acceptable decon procedure could lead to serious injury or death.**
3. **Once the user and the protective equipment have been decontaminated, proper disposal of affected equipment is to be performed. Disposal is to be performed as required by federal, state and/or local laws that apply to CBA contaminated materials.**

Failure to follow accepted safety and protection procedures when exposed to hazardous atmospheres can result in serious personal injury or death.

DECONTAMINATION

The PAPR may be used in some applications which may require decontamination of personal and respiratory equipment before the respirator may be removed. One such application is asbestos exposure decontamination.

Turn the motor-blower off before entering a decontamination shower. If the PAPR is equipped with a tight-fitting facepiece it still provides respiratory protection with the motor-blower off because all air is still drawn through the filters, chemical cartridges, or CS/CN canisters. However, breathing resistance will be greater than when the motor-blower is supplying air to the facepiece.

⚠ WARNING

If you are using a PAPR hood model, leave the motor-blower on. Do not breathe through the respirator for long periods of time with the motor-blower shut off. CO2 can build up in the hood causing serious personal injury or death.

SERVICE LIFE INDICATOR

The Mersorb-HE combination cartridge utilizes an End-of-Service-Life Indicator for use against metallic mercury vapor. The small area on the end of each 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 cartridges.

CARTRIDGE CHANGE-OUT SCHEDULE

If a cartridge or canister with an appropriate ESLI is not available, a change-out schedule based on objective information or data that will ensure that the cartridge(s) or canister is changed before the end of its service life, must be developed and implemented.

Service time is the measured or estimated period of time before breakthrough of an airborne contaminant (gas or vapor) for a specific chemical cartridge under specified conditions of the test.

The service time data presented in this investigation applies only to MSA respirators. It should be used as a guide only for determining an appropriate respirator cartridge change-out schedule as required for compliance with OSHA's Respirator Protection Standard (29 CFR 1910.134).

NOTES

AFTER USE

REMOVING THE RESPIRATOR WITH RUBBER HARNESS

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

REMOVING THE RESPIRATOR WITH PLASTIC ADVANTAGE HARNESS

1. To loosen the harness, push the bottom buckles forward and loosen.
2. Grasp the mask by the connector of filter and pull mask backward off the head.

REMOVING THE HALF-MASK FACEPIECE

1. Return to fresh air and clean the outer surfaces of the respirator before removing the facepiece.
2. Turn the power switch off.
3. On facepieces using the elastic headstrap, unfasten the top and bottom headstrap clips. Pull the facepiece out and away from your face to remove it.
4. On facepieces using the cradle headstrap, unfasten the bottom headstrap. Then pull the facepiece away from your face and up over your head.
5. Remove the support belt. Be careful that you do not drop the motor-blower.

REMOVING THE FULL-FACEPIECE

1. Return to fresh air and clean the outer surfaces of the respirator before removing the facepiece.
2. Turn the power switch off. Unthread the breathing tube coupling nut from the motor-blower.
3. Place your fingertips behind the headstraps. Place your thumbs on the buckles.
4. Pull the top of the buckles away from your head. Repeat as needed to loosen the headstraps.
5. Grip the facepiece by the speaking diaphragm housing.
6. Pull the facepiece out, then up over your head.

⚠ CAUTION

DO NOT pull the Ultravue Facepiece by the exhalation valve assembly. The facepiece rubber or the valve assembly can be damaged.

7. Remove the support belt. Be careful that you do not drop the motor-blower.

REMOVING THE TYVEK/SARANEX/TYCHEM QC HOODS PAPR

1. Return to fresh air and clean the outer surfaces of the respirator before removing the hood.
2. Place both hands under the neck seal and stretch it open.
3. Lift the back of the hood over your head, keeping the neck seal away from your face.
4. Turn the power switch OFF.
5. If you are finished using the hood, unthread the coupling nut and remove the breathing tube from the motor-blower. If you will be re-donning the hood soon, you may want to keep the tube connected.
6. Remove the support belt. Be careful that you do not drop the motor-blower.

MAINTENANCE

NIOSH certification requires that a maintenance program be established. This program must include cleaning, component inspection, and replacement of worn or damaged parts. See the appropriate parts lists for correct replacement part numbers.

⚠ CAUTION

Inspect the respirator after it has been cleaned and ensure all contaminant is removed. If you do not, you could be exposed to the contaminant upon reuse.

NOTES

CLEANING AND DISINFECTING

CLEANING AND DISINFECTING

All components (facepiece or hood, breathing tube, motor-blower, battery pack, and support belt) must be thoroughly cleaned after each use.

Clean the respirator after each use with Confidence Plus™ Cleaner (P/N 10009971) from MSA. 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.

⚠ WARNING

Be careful that you do not breathe or touch the contaminant in handling the respirator or its parts. Use equipment designed to protect you from the specific contaminant. Failure to follow this warning can result in serious personal injury or death.

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.
2. Disconnect the breathing tube from the facepiece or hood.
3. Clean and disinfect the facepiece:
   a. Remove filters, cartridges, or canisters from the facepiece.
   b. Remove any protective cover lens. This will prevent water from becoming trapped between the primary respirator lens and the cover lens (the trapped water will obscure vision).
   c. Remove the nosecup. This will facilitate cleaning the inside of the facepiece.
   d. Remove the exhalation valve cover. This will allow access to the rubber exhalation valve.
   e. Thoroughly wash the facepiece and components in the cleaning solution. A soft bristle (not wire) brush or sponge may be used. Be sure to clean under the exhalation valve.
   f. Disinfect the facepiece and components by submerging the facepiece and components for the recommended time period.
   g. Rinse the facepiece and components in clean, warm (110˚F), preferably running water. Drain.

⚠ CAUTION

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

   h. The facepiece and components should be air-dried or hand-dried with a clean lint-free cloth.

⚠ CAUTION

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

   i. After the facepiece is dry, inspect the facepiece thoroughly for missing or damaged parts. Re-install the exhalation valve cover. Install the nosecup (if used) and a new cover lens (if used). The facepiece may be stored in a clean storage bag to protect from contamination until the next use.

⚠ CAUTION

Alcohol should not be used as a germicide because it may deteriorate the rubber.

Note: The Tyvek/Saranex/Tychem QC Hoods cannot be cleaned in this way. Use a damp cloth or sponge saturated with Confidence Plus or equivalent cleaning solution to wipe the hood material clean.

4. Separate the motor-blower, battery pack, and filter or chemical cartridges (Refer to Unpacking and Inspection).
5. Use a damp cloth or sponge saturated with Confident Plus equivalent cleaning solution to wipe the breathing tube, motor-blower, and battery pack cases clean.

⚠ CAUTION

DO NOT place the motor-blower or battery pack in any liquid. If they are immersed, permanent damage can result.

6. Thoroughly wash and rinse the support belt in the Confidence Plus or equivalent cleaning solution. A soft brush or sponge may be used.
7. Re-assemble the respirator so that it will be ready for use.

Note: Following cleaning, apply a very thin film of Christo-Lube™ lubricant (P/N 604070) to the o-rings located on the breathing tube (and hood) coupling nut.

STORING THE PAPR RESPIRATOR

Store the charged NiCad Battery Pack within a temperature range of 65˚-80˚F for maximum battery life. Store the Lithium Battery Pack within a temperature range of 55˚-75˚F for maximum battery capacity and storage life.

The motor-blower can be stored at temperatures of 0˚-120˚F for periods of less than 6 months. If the PAPR will be stored for longer periods, store in the temperature range of 50˚-80˚F for optimum storage life and motor-blower performance. Long storage at higher or lower tem-

peratures may affect motor lubrication which may affect performance and product life.

Remaining PAPR components can be stored at temperatures of 0˚-120˚F. Check the PAPR periodically for proper operation. Assemble the PAPR and run the motor-blower at least once a year to be sure the battery and motor operate properly.

ACCESSORIES

ACCESSORIES

1. Nosecup - (Ultravue)
   The nosecup is used with the full facepiece to reduce lens fogging caused by high humidity or temperatures below 32°F. Ultravue nosecups are available in small, medium, or large to better fit the user. Any size nosecup may be used with any size facepiece. To install the nosecup:
   a. Place the nosecup in the facepiece and position it so its rubber ring faces toward the plastic retainer ring.
   b. Starting at the top, stretch and push the rubber ring of the nosecup under the plastic retainer ring of the speaking diaphragm assembly.
   c. Continue stretching the nosecup ring and work it into place.
2. Nosecup - (Ultra Elite)
   Nosecups for the Ultra Elite are available in medium gray (P/N 810412), and large gray (P/N 810413). To install the nosecup:
   a. Place the nosecup in the facepiece positioned under the face seal and with its rubber ring facing the speaking diaphragm.
   b. Starting at the bottom, stretch the rubber ring around and over the speaking diaphragm retaining ring. Looking through the facepiece lens, ensure that the rubber flange of the nosecup extends completely over the speaking diaphragm area of the component housing.
   c. Adjust the nosecup position if necessary to ensure its centerline aligns with the centerline of the faceblank.
   d. Lift the chin area of the nosecup and faceblank to expose the exhalation valve area of the component housing. With two fingers push the oval-shaped hole in the base of the nosecup down and completely around the plastic flange rising up from the surface of the component housing.
3. Advantage 3000(Model 3100) Nosecup:
   For Advantage 3000(Model 3100) Mask only:
   a Place nosecup into facepiece with notch of nosecup facing the bottom of facepiece.
   b Place bottom of nosecup facepiece seal.
   c. Stretch nosecup over inhalation valve housing, ensuring notch of nosecup is over tab of inhalation valve housing.
   d. Stretch nosecup around lip on inhalation valve housing, ensuring nosecup is in place.
4. Spectacle Kit (P/N 454819 - Ultravue, P/N 804638 - Ultra Elite, P/N 10029298 Advantage 3000 - Model 3100)
5. OptimAir 6 Flow Tester (P/N 488903), wall mounted.
6. OptimAir 6 Field Test Unit (P/N 468486), checks battery pack and motor-blower assembly.

⚠ CAUTION

The Filter Resistance Tester is not to be used with CS/CN canisters.

7. Integral Welder's Adapter (P/N 470786). The adapter replaces the lens in Ultravue Facepieces.
8. Clip-on Welder's Adapter (P/N 472859 - Ultravue, P/N 806482 - Ultra Elite). The Clip-on Welder's Adapter attaches to the full facepiece and provides eye protection for welding and brazing.
9. A Rayfoe™ Filter Plate of the correct shade also should be ordered. It includes an impact-resistant cover lens. The following Rayfoe Filter Plates are available:

Part No.	Shade No.
38346	6
38347	10
38277	12
38348	14

10. Modular Charging Rack
    (P/N 465528) Each modular charging rack makes it convenient to charge up to 10 battery packs using the standard battery chargers provided with each battery pack. The charging racks can be assembled into groups by stacking or wall mounting in multiples of 10. If using the dual-rate charger only 5 chargers can be accommodated.
11. Dual-Rate Charger (P/N 486614) Charges the P/N 491120 battery pack in 8 hours or less.
12. Protective Cover (P/N 808494)
    a. Slide protective cover over breathing tube and battery-blower unit (for ease of insertion it may be helpful to turn the motor-blower on during this step.)
    b. Seal protective cover tube at top with tape.
    c. Replace belt through apertures in cover and loops on motor-blower unit.
    d. Thread filters, cartridges, or CS/CN canisters through holes in cover into receptacles.
13. Optional Chin Strap (P/N 484319, elastic; P/N 484320, cotton webbing) The chin strap must be attached to the hood suspension before the suspension is installed in the hood. To install the chin strap refer to Tyvek/Saranex/Tychem QC Hoods — Installing the Hood Suspension.

ACCESSORIES

14. Optional protective cap for Tyvek Hoods. To install the cap refer to Tyvek Hood — Installing an Optional Protective Cap.

Note: If a protective cap is to be worn, it must be from MSA. Only the cap from MSA is equipped with proper adapters to secure the hood to the cap.

15. Flow Check Gauge (P/N 487995) allows users of PAPR units with tight-fitting facepieces to verify that their unit is providing the required air flow.

16. 36" Facepiece breathing tube (P/N 492197) is available for users who require a longer tube. The standard tube is 30" long.
17. Ten unit dual-rate charger (P/N 496770) charges up to ten P/N 491120 battery packs at one time in 8 hours or less.
18. Replacement Lithium Battery Pack (P/N 10048180).
19. Spark Cover (P/N 10068152)
    a. Remove spark cover from packaging.
    b. Install the filter cartridge.
    c. Once the filter cartridge is attached, align the feet of the spark cover with the inlet hole of the cartridge.

check for optional spark arresting material

BREATHING TUBE ASSEMBLIES

Parts of the breathing tube assembly P/N 486364, which is used on tight-fitting facepieces and breathing tube assembly P/N 481980, which is used on the hood, have been certified incinerable by Scientific Ecology Group, Inc. (SEG). If either of the two breathing tube assemblies will be submitted to SEG for incineration, the steel clamp must be removed from each end of the tube.

Note: Breathing tube assemblies that have previous design connectors on them are not incinerable. Previous design connectors are made from aluminum instead of polycarbonate. Breathing tube assemblies that are submitted for incineration must have polycarbonate connectors.

Tyvek Hood

Parts of the Tyvek Hood, P/N 486485, are certified incinerable per Scientific Ecology Group, Inc. (SEG) requirements. The SEG logo appears on the warning tag of the Tyvek Hood. If the Tyvek Hood will be submitted to SEG for incineration, the steel clamp on the inlet tube must be removed first. The inlet assembly, which is held in place by the clamp, may be submitted with the rest of the Tyvek Hood for incineration.

PAPR ASSEMBLIES

MSA Part Number	Facepiece Type									Rubber		Motor Type		Battery Type	
	Full Facepiece (Medium) NIOSH Approval: TC-21C-512		Half-Mask (Medium, with Cradle Headband) NIOSH Approval: TC-21C-513				Hood			Hycar (Black)	Silicone (Black)	Brush	Brushless	NiCad	Lithium
			Comfo		Comfo Elite		NIOSH Approval: TC-21C-516	NIOSH Approval TC-21C-516	NIOSH Approval TC-21C-516						
	Ultravue	Ultra Elite	Chin-Style	Welder's	Chin-Style	Welder's	Tyvek	Saranex	Tychem QC						
494236	●									●		●		●	
800749			●							●		●		●	
800767				●						●		●		●	
491301							●			— —	— —	●		●	
10041537								●		— —	— —	●		●	
10082263									●	— —	— —	●		●	

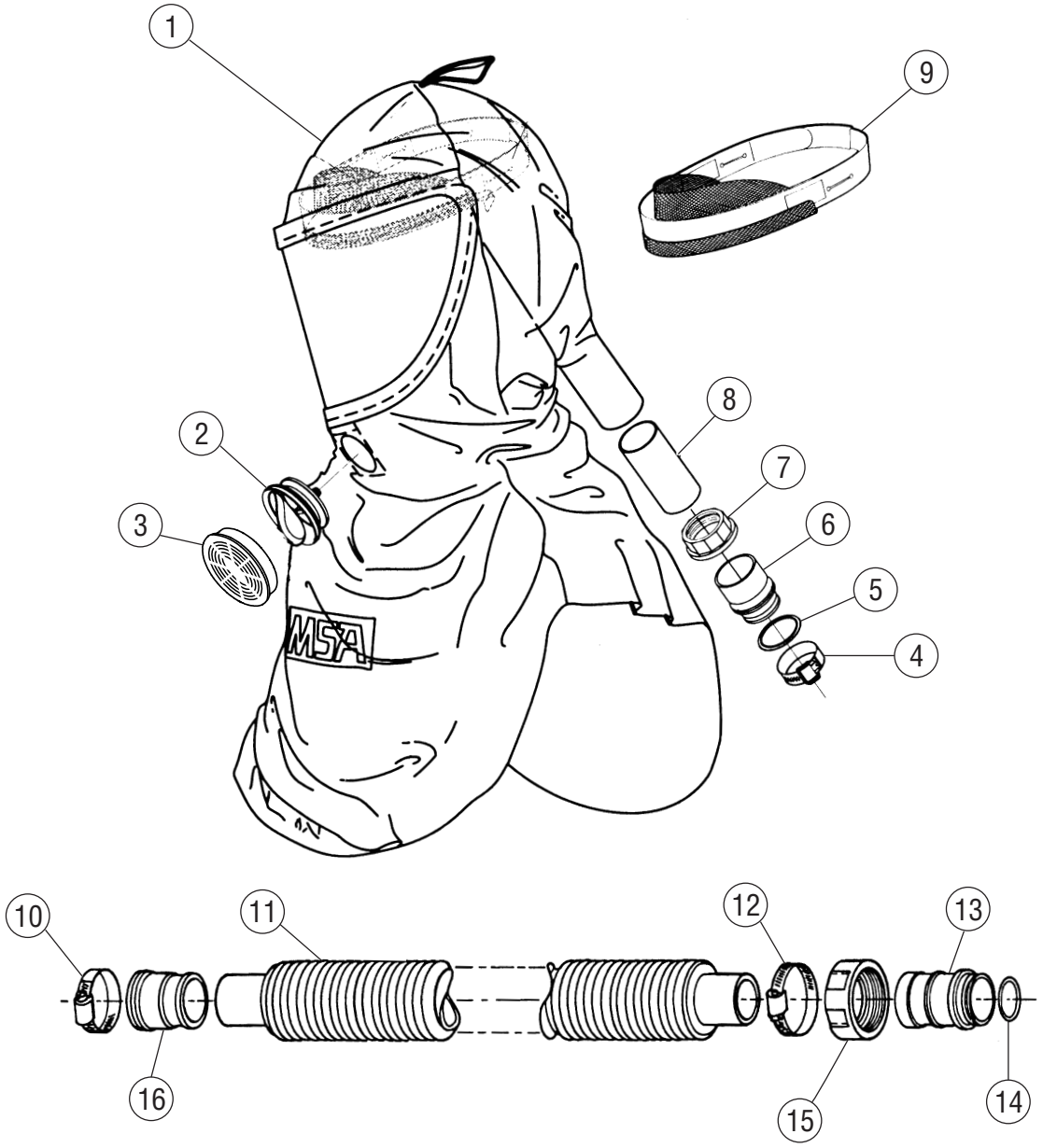
PAPR SUBASSEMBLIES

P/N 486485 Tyvek Hood Assembly - Shoulder Length
P/N 492795 Tyvek Hood Assembly - Waist Length
P/N 10041551 Saranex Hood Assembly - Shoulder Length
P/N 10082219 Tychem QC Hood Assembly - Single Bib

Caps and Suspensions from MSA for Tyvek Hoods

Part No.	Description
482646	Special V-Gard Slotted Cap, small (functions as hood suspension)
482647	Special V-Gard Slotted Cap, standard (functions as hood suspension)
454230	Replacement Staz-on Suspension (for standard V-Gard Slotted Cap)
467386	Replacement Staz-on Suspension (for small V-Gard Slotted Cap)
473332	Replacement Fas-Trac Suspension (for standard V-Gard Slotted Cap)
482614	Replacement Simple Hood Suspension
484319	Optional Chin Strap (elastic)
484320	Optional Chin Strap (cotton webbing)

OPTIMAIR® 6A PAPR WITH SARANEX HOOD



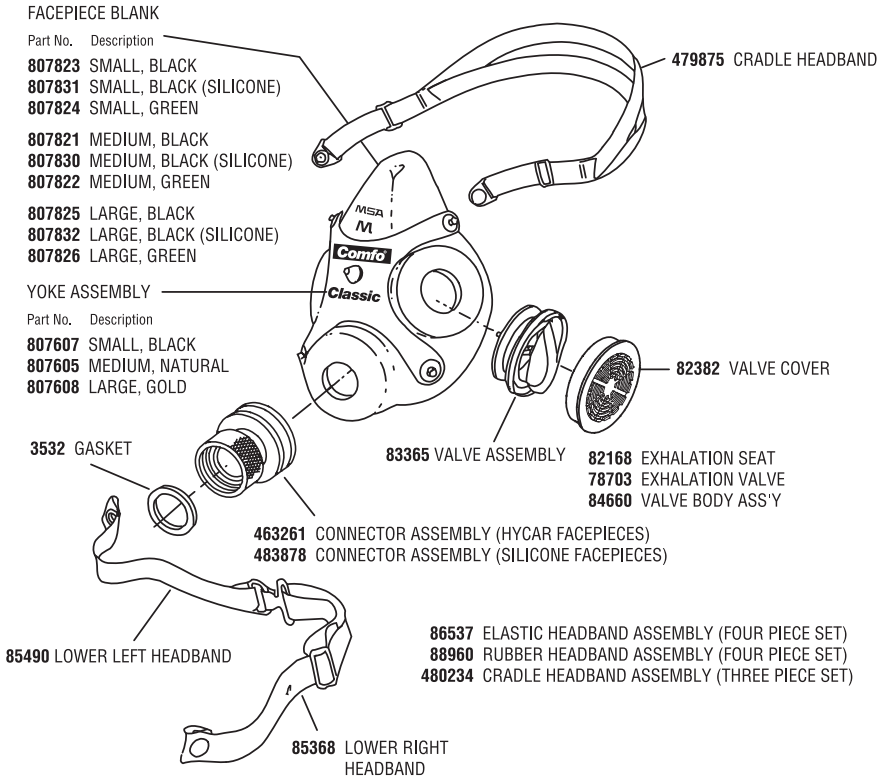
Item Number	Part Number	Description
1	**10041551**	Hood, Shoulder Length
83365 COMPLETE VALVE ASSEMBLEY		
2	**84660**	Exhalation Valve Body Assembly
3	**82382**	Exhalation Valve Cover
4	**626254**	Clamp
5	**628082**	O-Ring
6	**801035**	Connector Insert
7	**467175**	Connector Nut
8	**486472**	Tube
9	**482614**	Suspension
481980 19" BREATHING TUBE ASSEMBLY		
10	**626254**	Clamp
11	**490689**	Corrugated
12	**626254**	Clamp
13	**801035**	Connector Insert
14	**628082**	O-Ring
15	**467175**	Connector
16	**801074**	Exhalation Connector

OPTIMAIR 6A PAPR WITH COMFO® FACEPIECE

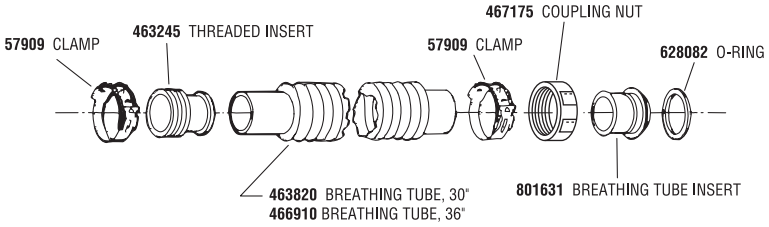
Half-Mask Chin-Style Facepiece Matrix

MSA Part Number	Type		Size			Rubber		Headband	
	Comfo Classic	Comfo Elite	Small Model 7-476-2	Med. Model 7-476-1	Large Model 7-476-3	Hycar (Black)	Silicone (Black)	Elastic	Cradle
480127	●		●			●			●
480122	●			●		●			●
480132	●				●	●			●
480130	●		●				●		●
480125	●			●			●		●
480135	●				●		●		●
490206		●	●				●		●
490202		●		●			●		●
490210		●			●		●		●

Facepiece Components



486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly

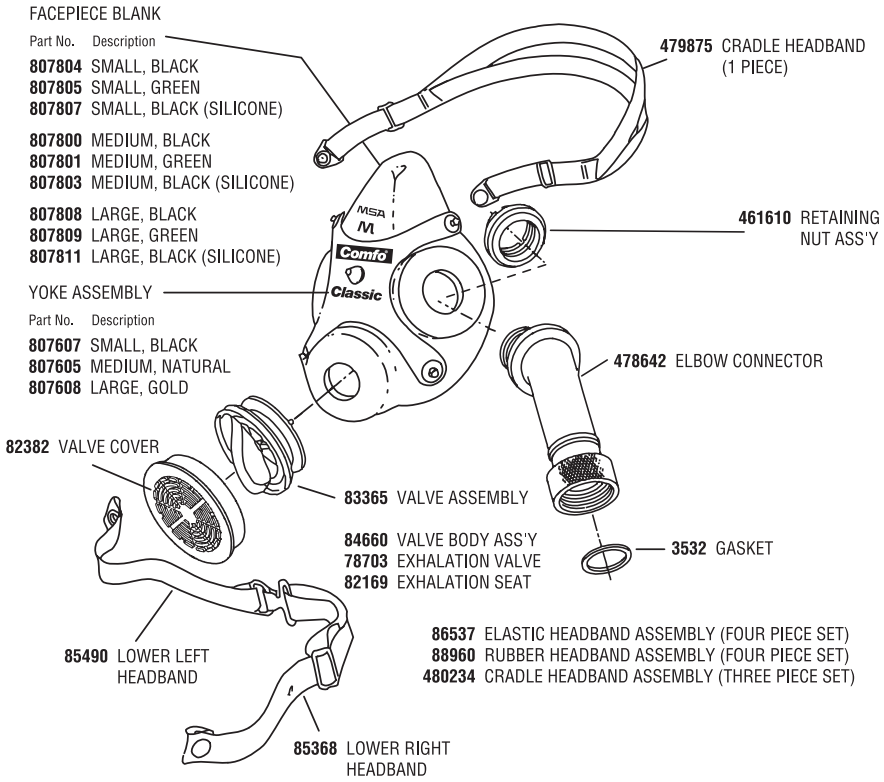


OPTIMAIR® 6A PAPR WITH COMFO® WELDER'S FACEPIECE

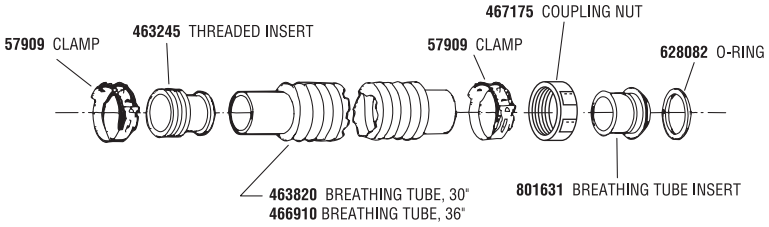
Half-Mask Welder's Facepiece Matrix

MSA Part Number	Type		Size			Rubber		Headband	
	Comfo Classic	Comfo Elite	Small Model 7-727-2	Med. Model 7-727-1	Large Model 7-727-3	Hycar (Black)	Silicone (Black)	Elastic	Cradle
484204	●		●			●			●
484198	●			●		●			●
484210	●				●	●			●
484206	●		●				●		●
484200	●			●			●		●
484212	●				●		●		●
490277		●	●				●		●
490273		●		●			●		●
490281		●			●		●		●

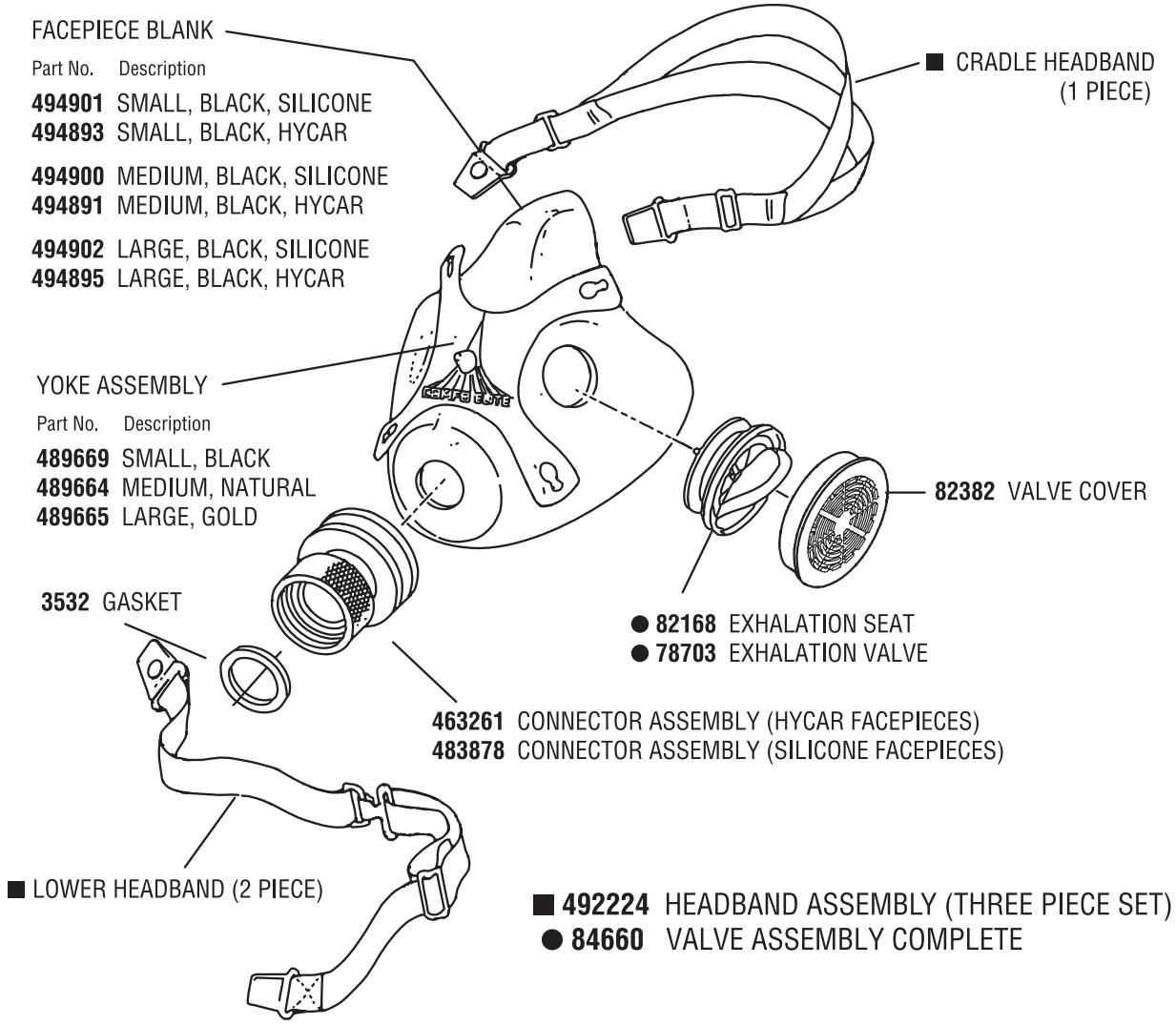
Facepiece Components



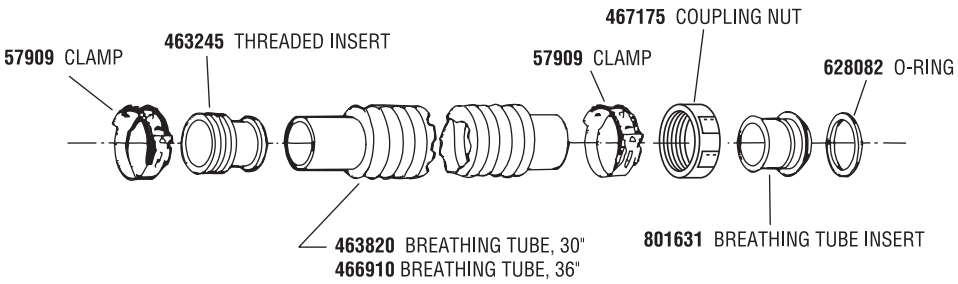
486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



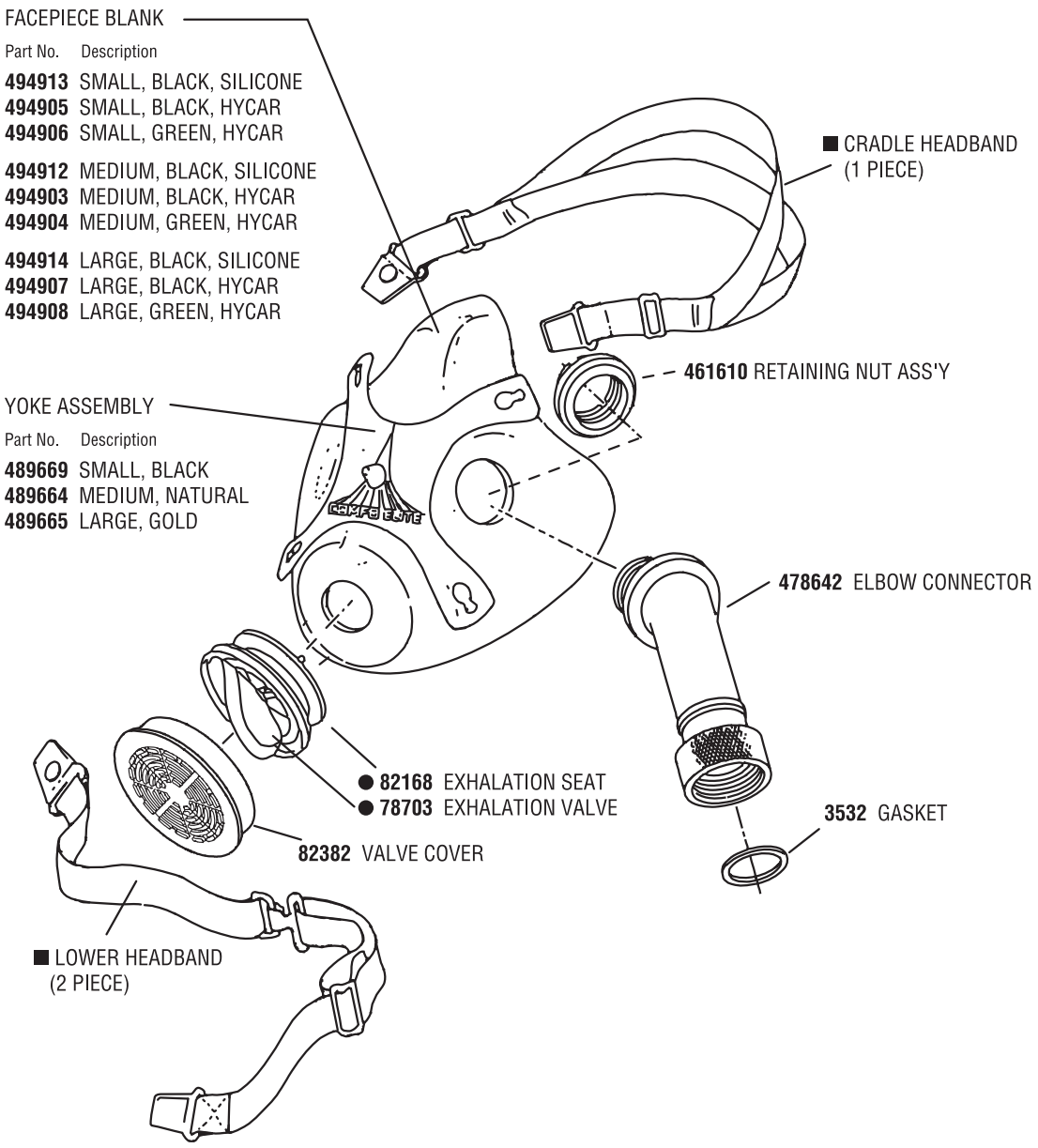
Facepiece Components



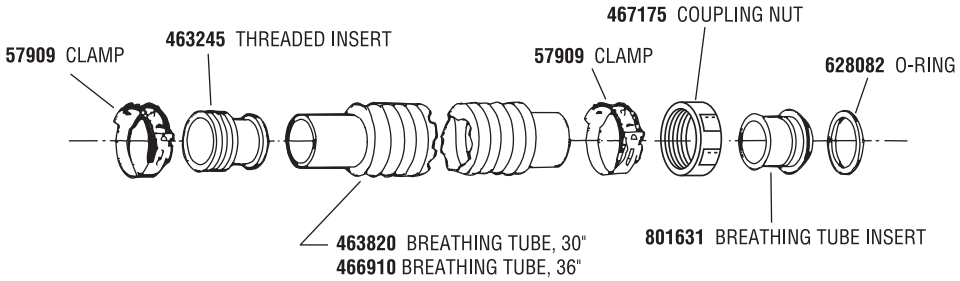
486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



Facepiece Components



486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly

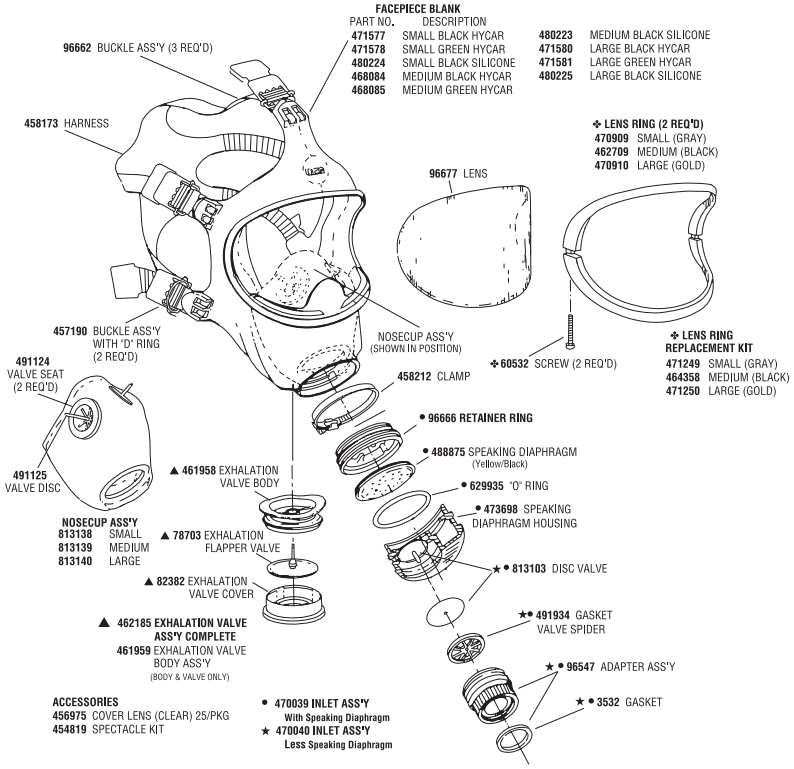


OPTIMAIR® 6A PAPR WITH ULTRAVUE® FACEPIECE

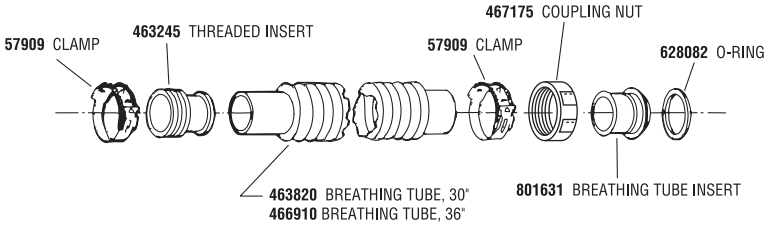
Full Facepiece Matrix

MSA Part Number	Type		Size			Rubber		Color		
	Ultravue	Ultra-Elite	Small Model	Med. Model	Large Model	Hycar	Silicone	Black	Blue	Gray
471218	●		●			●		●		
457126	●			●		●		●		
471230	●				●	●		●		
480251	●		●				●	●		
480247	●			●			●	●		
480255	●				●		●	●		
493064		●	●			●		●		
493020		●		●		●		●		
493108		●			●	●		●		
493072		●	●				●	●		
493028		●		●			●	●		
493116		●			●		●	●		

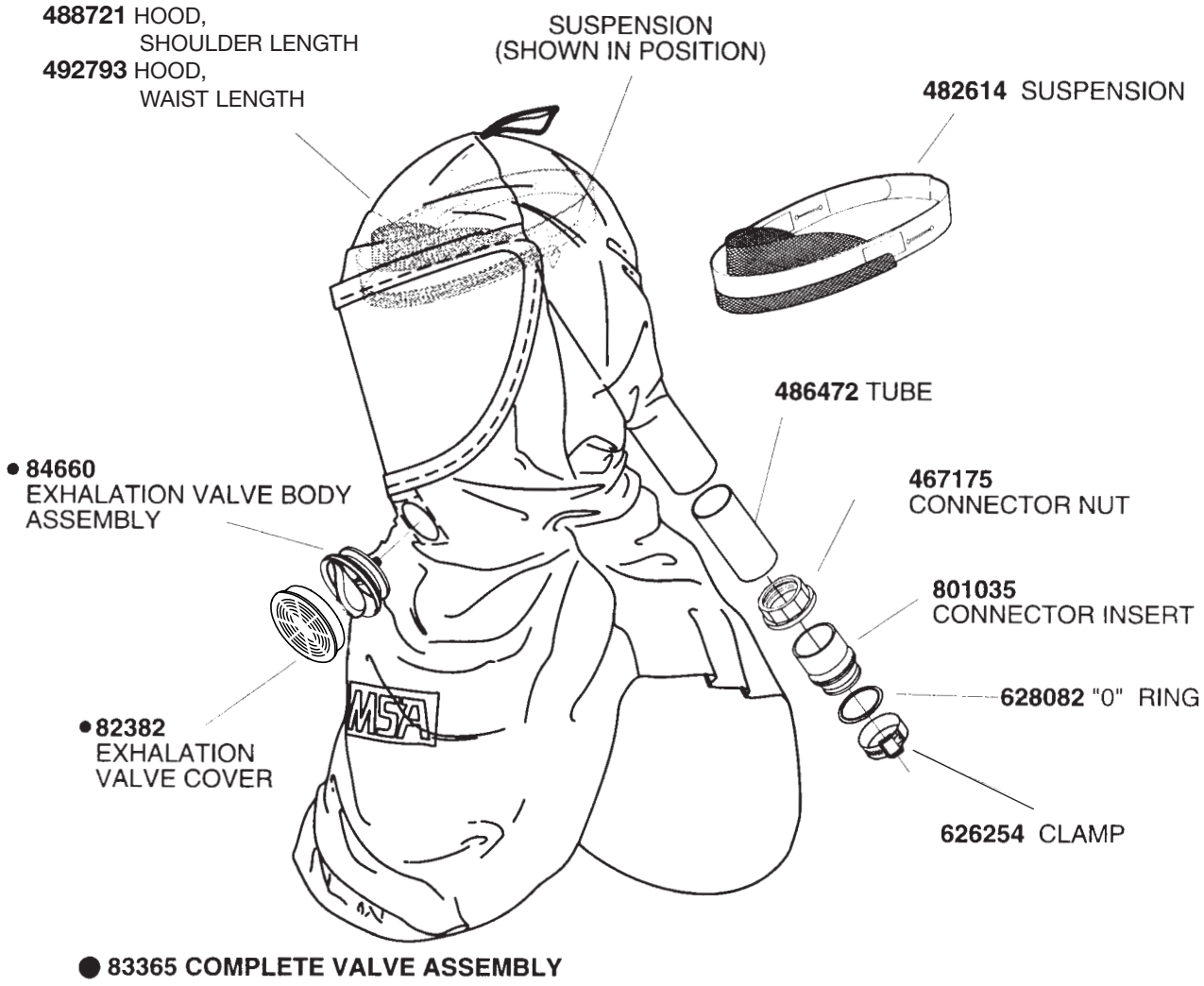
Facepiece Components



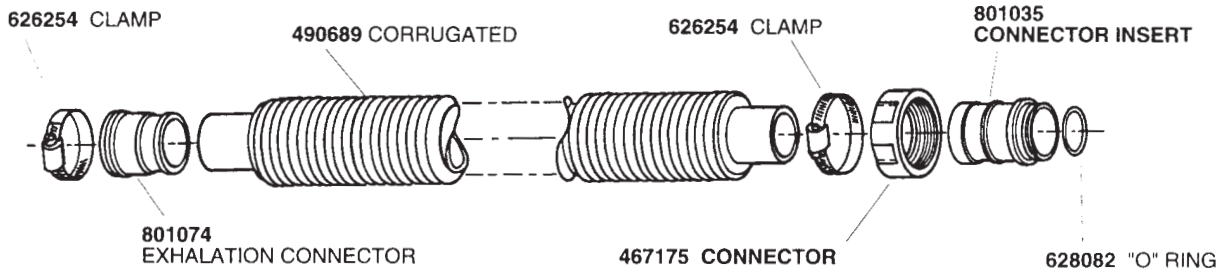
486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



OPTIMAIR® 6A PAPR WITH TYVEK HOOD



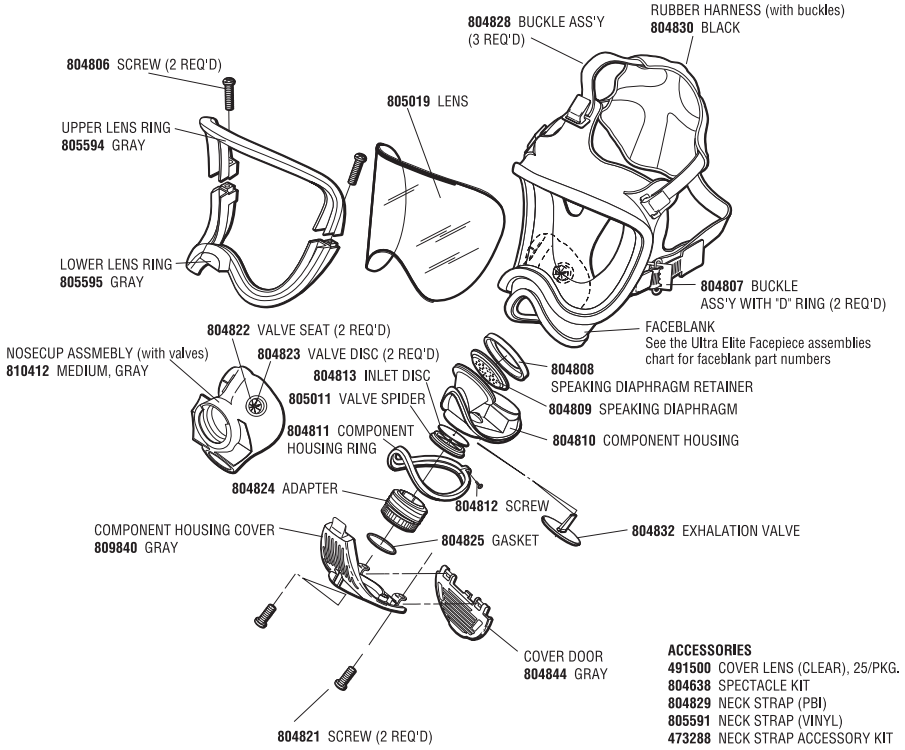
481980 19" Breathing Tube Assembly



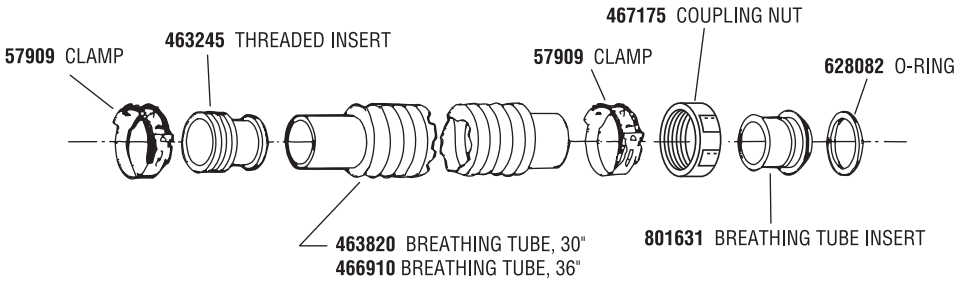
OPTIMAIR® 6A PAPR WITH ULTRA ELITE® FACEPIECE

Assembly	Size			Elastomer		Faceblank
Part Number	Small Model 7-934-2	Medium Model 7-934-1	Large Model 7-934-3	Black Hycar	Black Silicone	Part Number
493064	•			•		490128
493072	•				•	491388
493020		•			•	490138
493028		•		•		491387
493108			•	•		491039
493116			•		•	491389

Facepiece Components



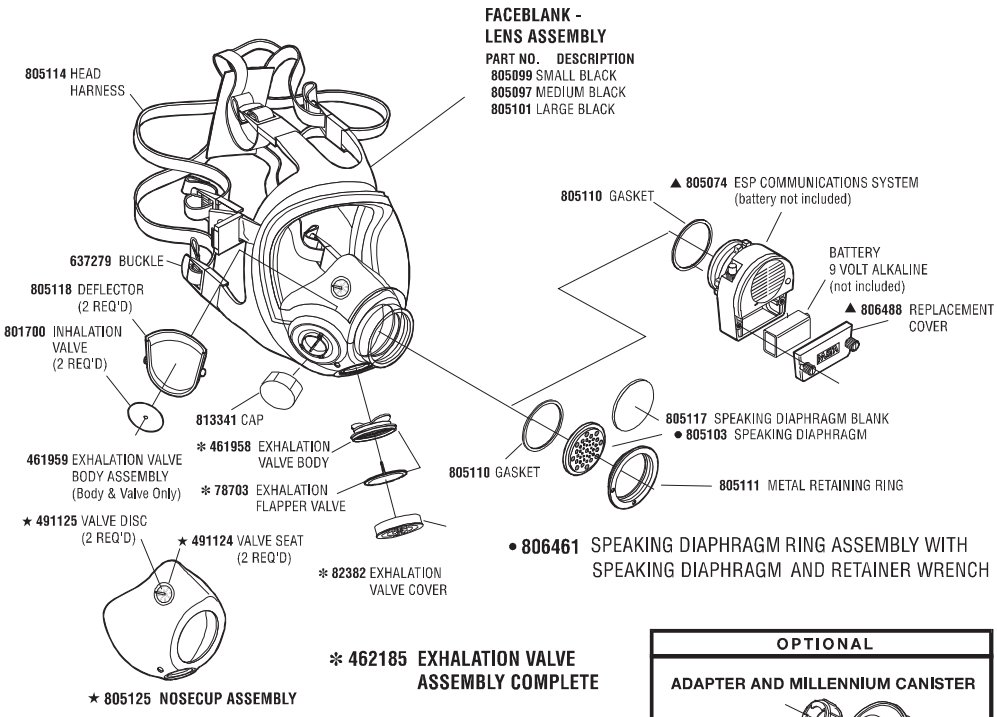
486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



ADVANTAGE® 1000 Facepiece

Note: Advantage 1000 Facepiece must have the P/N 10012413 kit and P/N 96547 adapter installed on the facepiece.

Respirator Components

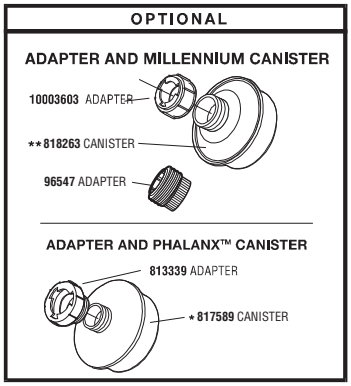


ACCESSORIES

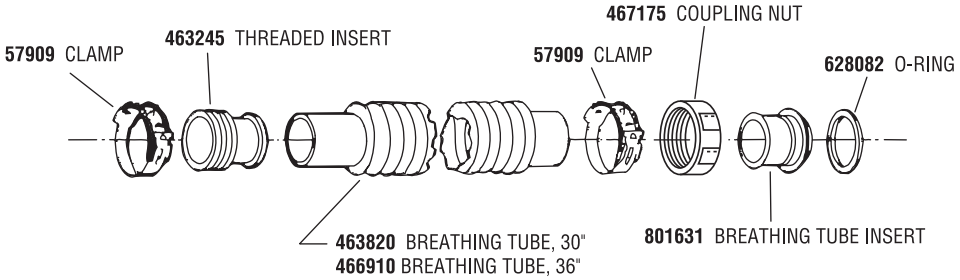
PART NO.	DESCRIPTION
807543	SPEAKING DIAPHRAGM RETAINER WRENCH
813832	FLEXIBLE COVER LENS, PKG/25 (CLEAR)
813833	FLEXIBLE COVER LENS, PKG/25 (SMOKE)
454819	SPECTACLE KIT
805350	MICROPHONE / VOICEMITTER

† SOLD IN PACKAGES OF 6 (P/N 817590)
*SOLD IN PACKAGES OF 6 (P/N 817591)
**SOLD IN PACKAGES OF 6 (P/N 818264)

OPTIONAL



486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



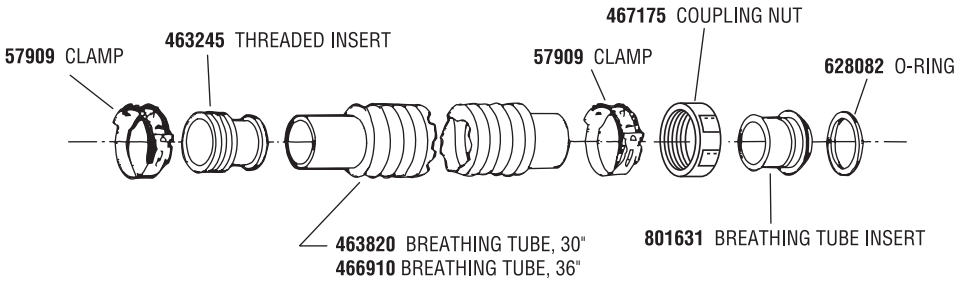
MILLENNIUM FACEPIECE

Note: Millennium Facepiece must have the P/N 10012413 kit and P/N 96547 adapter installed on the facepiece.

*sold in packages of 6, P/N 817591
**sold in packages of 6, P/N 818264
***sold in packages of 6, P/N 10011890

10008907	Lens Outsert, small, clear
10008906	Lens Outsert, medium/large, clear
10008909	Lens Outsert, small, tinted
10008908	Lens Outsert, medium/large, tinted
816137	Spectacle Kit
305022	Butyl-Coated Nylon Hood

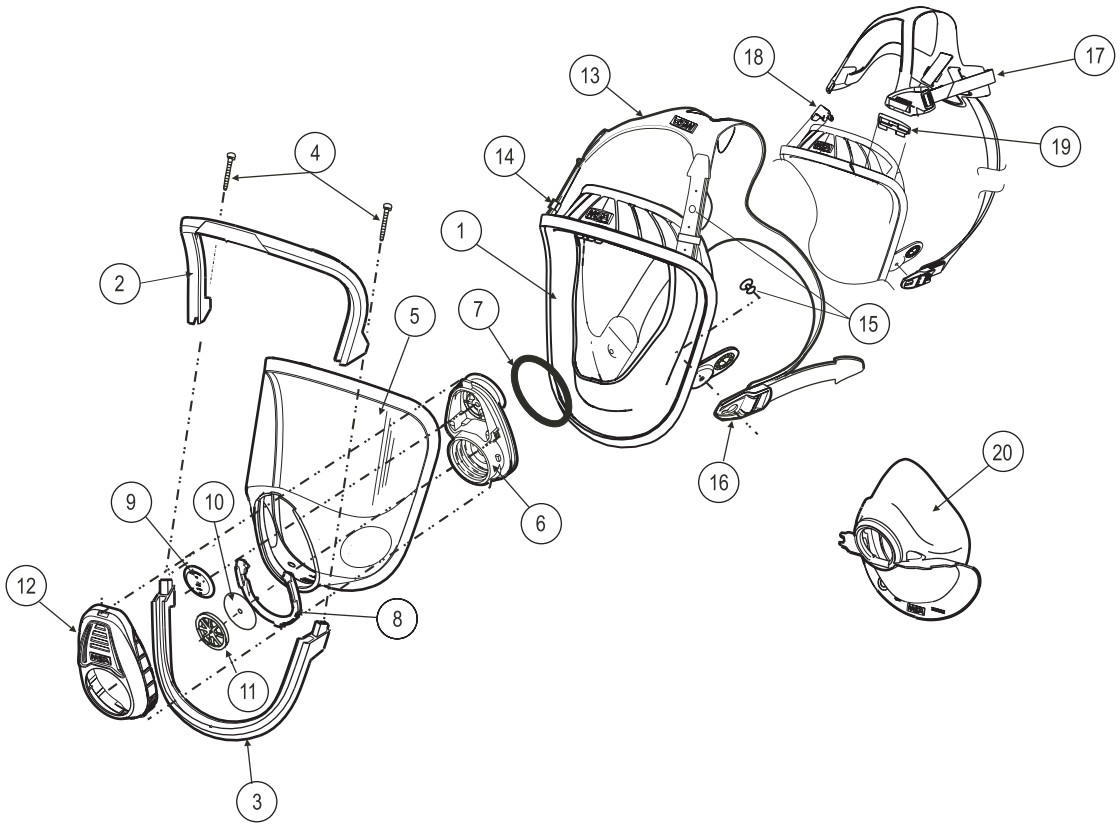
486364 30" Breathing Tube Assembly
492197 Optional 36" Breathing Tube Assembly



Advantage® 3000

model 3100 single port

Advantage 3100 Facepiece Assemblies	
Part No.	**Description**
10028999	Small with Rubber Harness
10028998	Medium with Rubber Harness
10029000	Large with Rubber Harness
10031343	Small with Advantage (Plastic) Harness
10031342	Medium with Advantage (Plastic) Harness
10031344	Large with Advantage (Plastic) Harness



Advantage 3100 Facepiece Components		
Item No.	**Part No**	**Description**
1	**10025280**	Small, Faceblank Silicone
	10025258	Medium, Faceblank Silicone
	10025259	Large, Faceblank Silicone
-Kit-	**10030785**	Lens Ring Kit
2	*	1 - Upper Lens Ring
3	*	1 - Lower Lens Ring
4	*	2 – Lens Ring Screw
5	**10025282**	Single Port Lens
-Kit-	**10030791**	Single Port Housing Replacement Kit
6	*	1 – Single Port Housing
7	*	1 - O-ring
8	*	1 - Retainer Clip
9	**10030789**	Exhalation Valve, 6 per Package
10	**10030788**	Inhalation Valve, 10 per Package
11	**10025292**	Spider Gasket
12	**10025291**	Cover
-Kit-	**10030794**	Classic Rubber Harness Kit
13	*	1 - Rubber Harness

Advantage 3100 Facepiece Components		
Item No.	**Part No**	**Description**
14	*	2 – Slide
15	*	4 – Harness Button
16	*	2 – Buckle
14	**10030797**	Slide for Classic Rubber Harness, 10 per Package
15	**10030795**	Harness Button , 12 per Package
16	**10030796**	Buckle for Classic Rubber Harness, 6 per Package
-Kit-	**10030798**	Advantage (Plastic) Harness Kit
17	*	1 Advantage Harness
18	*	1 Right Adapter Clip
19	*	1 Left Adapter Clip
Accessories		
20	**10030792**	Medium/Large Nose Cup
	10030793	Small Nose Cup
Not Shown	**10029298**	Spectacle Kit
Not Shown	**10031542**	Cover Lens, Clear, 25 per Package
Not Shown	**10031543**	Cover Lens, Smoke, 25 per Package

*** Item Available in Kit**

NOTES

NOTES

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA
The Safety Company

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PITTSBURGH, PENNSYLVANIA, U.S.A. 15230