

Ultra-Twin[®]

respirator
with Ultra-Twin[®], Ultravue[®], Ultra
Elite[®], or Duo-Twin[™] Facepiece

instructions for use and care

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 inside for Instructions, NIOSH Approval Information, Cautions and Limitations, and Warnings. The warranties made by MSA with respect to the product are voided if the product is not installed, used, and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the WARNINGS and CAUTIONS inside. We encourage our customers to write or call for a demonstration of this equipment prior to use or for any additional information relative to use or repairs. Call 1-800-MSA-2222 during regular working hours, or 1-800-MSA-5555 after working hours or during emergencies.

Manufactured by

MSA

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

TABLE OF CONTENTS

NIOSH APPROVAL INFORMATION	3
Cautions and Limitations	3
Special User Instructions	3
RESPIRATOR USE LIMITATIONS	4
MIXTURE OF CONTAMINANTS	5
Time Use Limitation	6
EXPOSURE LIMITS	6
Exposure Limits for Mixtures	6
RESPIRATOR FIT TEST	7
Quantitative Test	7
Qualitative Test	7
ASSEMBLY INSTRUCTIONS	7
Ultra-Twin Adapters 481740 and 484679	7
Ultra-Twin Adapter 491766 or Duo-Twin Adapter 491834	8
Duo-Twin Plug	8
PREPARATIONS FOR USE	8
FITTING THE RESPIRATOR	9
TEST FOR TIGHTNESS	10
REPLACING CARTRIDGES AND FILTERS	11
CLEANING AND DISINFECTING	11
MAINTENANCE	12
SUBMITTING ULTRA-TWIN RESPIRATORS (SILICONE) FOR INCINERATION	12
ULTRA-TWIN RESPIRATORS	13
STANDARD ULTRA-TWIN FACEPIECE ASSEMBLIES	14
PROBED ULTRA-TWIN FACEPIECE ASSEMBLIES	15
ULTRAVUE FACEPIECE ASSEMBLIES	16
ULTRA ELITE FACEPIECE ASSEMBLIES	17
DUO-TWIN FACEPIECE ASSEMBLIES	18

NIOSH APPROVAL INFORMATION

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- Do not wear for protection against organic vapors with poor warning properties or those which generate high heats of reaction with sorbent.
- J- Failure to use and maintain this product properly could result in injury or death.
- L- Follow the manufacturer's User Instructions for changing cartridges and/or filters.
- M- All approved respirators shall be selected, fitted, used, and maintained in accordance with 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 Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
- S- Special or critical user instructions and/or specific use limitations apply. Refer to User Instructions before donning.

Special User Instructions

Mersorb®-P100 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.

Mersorb-P100 respirators utilize an end-of-service-life indicator for use against metallic mercury vapor. The band around the side of each Mersorb-P100 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.

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 the 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 matrix to determine if this device can be used for escape from those concentrations.) (Exception: escape from particulates is unlimited.)
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 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 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 facepiece if such conditions exist.
8. Never alter or modify this device.
9. This respirator is for use by trained and qualified personnel only.

Failure to follow these precautions can result in serious personal injury or death.

RESPIRATOR USE LIMITATIONS

The wearer must comply with the following MSA 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. 1,000 parts per million organic vapors (for organic vapor respirators).
 - c. Immediately dangerous to life or health (IDLH) concentration for any contaminant present.

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 wear for protection against substances with poor warning properties or those which generate high heats of reaction with sorbent material in the cartridge.
5. Do not use for 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 materials.

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

6. Mixture of Contaminants — NIOSH allows this respirator to 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/filter must be approved for **all** contaminants present.
 - b. NIOSH permits mixing of the following contaminants: organic vapors, sulfur dioxide, chlorine, ammonia, methylamine, chlorine dioxide, hydrogen sulfide, and hydrogen chloride.
 - c. Particulates can be mixed with any gas or vapor for which the cartridge is approved.
 - d. 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).
 - e. MERSORB-P100 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.

7. GMT Cartridge users are limited to 10 mpca for a maximum of 60 minutes and must use the cartridges immediately after opening the bag.

Time Use Limitation

N95 and R95 filters shall be limited to 8 hours of use (continuous or intermittent) against particulates. [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 efficiency below 95% or (b) that the total mass loading of the filter is less than 100 mg.]

EXPOSURE LIMITS

A listing of acceptable exposure limits from the following sources is provided in MSA's *Response® Respirator Selector* (P/N 697254):

- 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, \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:

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

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* (P/N 697254) for additional information.

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.

WARNING

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

ASSEMBLY INSTRUCTIONS (Accessories)

These accessories enable other demand facepieces (Ultravue, Ultra Elite, Duo-Twin) to function as an Ultra-Twin Facepiece.

Ultra-Twin Adapters 481740 and 484679

1. To use these adapters, you will need a coupling nut P/N 96547 if one is not already included with the facepiece. Thread the coupling nut into the facepiece inlet and tighten so it is secure.

2. Remove the Ultra-Twin adapter from carton and position on the inlet assembly of the facepiece.
3. Hand tighten the plastic coupling nut on the facepiece inlet assembly making sure that the male portion of the adapter seals against the gasket in the inlet assembly.

CAUTION

Do not attempt to remove the cartridge receptacles from the TEE portion of the adapter as they are permanently bonded together. Separation will destroy the adapter.

Ultra-Twin Adapter 491766 or Duo-Twin Adapter 491834

1. Remove the coupling nut (P/N 96547) from the facepiece inlet assembly if present. Check to ensure that the spider gasket is in place in the inlet assembly.

WARNING

Do not use unless the spider gasket is in place. An air-tight seal cannot be achieved without the spider gasket. Use without the spider gasket can result in the user suffering serious respiratory injury or death.

2. Remove the adapter from bag and position in the inlet of the facepiece.
3. Hand tighten the plastic nut on the adapter making sure that the male portion of the adapter seals against the spider gasket in the facepiece inlet.
4. If using the Duo-Twin adapter, attach the Duo-Twin plug as described in the following section.

Duo-Twin Plug

Remove the Duo-Twin plug from its bag and position it on the inlet assembly of the Duo-Twin facepiece or the Duo-Twin adapter.

Hand tighten the plastic nut on the inlet assembly so that the plug seals against the gasket in the coupling nut.

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 receptacles: Check to make sure gaskets are in place and check for cracks and damage to threads.
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 metal sealing bead around the bottom.

Assemble the respirator as follows:

CARTRIDGES: Thread cartridges into receptacles carefully. Hand tighten to prevent damage to threads. To ensure a good seal against the gaskets, tighten each cartridge by gripping as much of the circumference of the receptacle as possible and then slowly turning the cartridge until tight.

FILTERS: Insert the appropriate filter into the appropriate filter cover. Never load filters into the receptacles. Snap filter covers onto both receptacles or cartridges taking care not to damage filters.

FITTING THE RESPIRATOR

Pull out headband straps, especially the "FRONT" or forehead strap, so that their ends are at the buckles, then grip facepiece between thumb and fingers. Insert chin well into the lower part of facepiece and pull headbands back over head. To obtain a firm and comfortable fit against the face at all points, adjust headbands as follows:

1. See that straps lie flat against head.
2. Tighten the lower or "Neck" straps.
3. Tighten the "SIDE" straps. (Do not touch forehead or "FRONT" strap.)
4. Place both hands on headband pad and push it towards the neck.
5. Repeat operations (2) and (3).
6. Tighten forehead or "FRONT" strap a few notches if necessary.

TEST FOR TIGHTNESS

Test the respirator for leakage using a positive pressure method. Lightly place the palm of your hand over the exhalation valve cover. Gently exhale. A slight positive pressure should build up inside the respirator. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other than facial seal leakage is detected, the condition must be investigated and corrected before another test is made. A negative pressure test may also be performed on certain types of respirators. Lightly place palms over cartridges or filter holders. Gently inhale and the facepiece should collapse against the face. The respirator must pass the tightness tests before the respirator can be used. The respirator will not furnish protection unless all inhaled air is drawn through suitable cartridges or filters. The respirator must be subjected to the Tightness Test before each use.

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 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 oxygen concentration sufficient to support life is questionable.**
- 5. Respirator does not leak (see Test for Tightness).**
- 6. Cartridges 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.

REPLACING CARTRIDGES AND FILTERS

The following conditions are indications that the cartridges or filters have served their useful life and must be replaced.

CARTRIDGES:

- Odor or taste of gases or vapors; eye, nose, or throat irritation.
- Mersorb-P100 Cartridges only: Brown color on end-of-service-life indicator
- GMT Cartridge only: Maximum 60 minute use.

FILTERS: Excessive breathing resistance upon inhalation.

To replace cartridges proceed as follows:

1. Remove the expended cartridges and discard.
2. Remove the replacement cartridges from storage bags and insert into the threaded receptacles making sure gaskets are in place in the receptacles.
3. Carefully hand tighten the cartridges to prevent damage to threads. To ensure a good seal against the gaskets, tighten each cartridge by gripping as much of the circumference of the receptacle as possible and then slowly turning the cartridge until tight.

To replace filters proceed as follows:

1. Remove the filter covers and discard filters.
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

The facepiece (with the cartridges removed) should be cleaned and disinfected after every use with MSA's Cleaner-Disinfectant Liquid (P/N 697284).

1. Dilute the Cleaner-Disinfectant Liquid with water according to its use instructions.
2. Immerse soiled equipment in the solution and scrub gently with a soft brush until clean. Take care to clean the exhalation valve in the facepiece and all other parts that exhaled air contacts.
3. Rinse in plain, warm water (maximum 120°F) and then air dry.

CAUTION

Cleaning and disinfecting at or below 120°F will avoid possible overheating and distortion of parts of the respirator assembly, which would necessitate replacement.

MAINTENANCE

This respirator must be kept in good condition to function properly. When any part shows evidence of excessive wear or damage, it must be replaced immediately with the proper part. Extra parts should be readily available. Refer to the Preparations for Use section for proper inspection of the respirator.

This respirator, when not in use, should be stored in a clean, dry location. Do not distort rubber facepiece during storage.

SUBMITTING ULTRA-TWIN RESPIRATORS (SILICONE) FOR INCINERATION

Parts of the Ultra-Twin Facepiece Assembly (silicone only) have been certified incinerable by Scientific Ecology Group, Inc. (SEG). If the Ultra-Twin facepiece will be submitted for incineration, the following conditions must be satisfied:

1. The SEG logo must appear on the facepiece. The SEG logo is located inside the facepiece opposite the date code on Ultra-Twin silicone facepieces.
2. The following parts must be removed and disposed of separately (refer to Ultra-Twin Facepiece Components on page 16).
 - a. Lens ring, Qty 2, P/N 470909 (small, grey), or P/N 462709 (medium, black), or P/N 470910 (large, gold).
 - b. Lens ring screw, Qty 2, P/N 60532
 - c. Buckle assembly, Qty 3, P/N 96662
 - d. Buckle assembly with "D" ring, Qty 2, P/N 457190
 - e. Head harness, Qty 1, P/N 458173
 - f. Speaking diaphragm assembly, Qty 1, P/N 470038, or Housing assembly, P/N 470030
 - g. Clamp, Qty 1, P/N 458212
 - h. Any cartridges

The following accessory equipment must also be removed and disposed of separately:

- Nosecup assembly, Qty 1, P/N 471710 (small), P/N 471711 (medium), and P/N 471712 (large)
- Spectacle Kit, Qty 1, P/N 454819

STANDARD FACEPIECES AVAILABLE

Part No.	Type	Size			Material
		Small	Medium	Large	
483843	Duo-Twin	•			Hycar rubber
483851	Duo-Twin	•			Silicone
483819	Duo-Twin		•		Hycar rubber
483833	Duo-Twin		•		Silicone
483855	Duo-Twin			•	Hycar rubber
483871	Duo-Twin			•	Silicone
493064	Ultra Elite	•			Hycar rubber
493072	Ultra Elite	•			Silicone
493020	Ultra Elite		•		Hycar rubber
493028	Ultra Elite		•		Silicone
493108	Ultra Elite			•	Hycar rubber
493116	Ultra Elite			•	Silicone
471219	Ultravue	•			Hycar rubber
471221	Ultravue	•			Hycar rubber
480254	Ultravue	•			Silicone
471213	Ultravue		•		Hycar rubber
480250	Ultravue		•		Silicone
471233	Ultravue			•	Hycar rubber
480256	Ultravue			•	Silicone
471304	Ultra-Twin	•			Hycar rubber
480263	Ultra-Twin	•			Silicone
471286	Ultra-Twin		•		Hycar rubber
480259	Ultra-Twin		•		Silicone
471310	Ultra-Twin			•	Hycar rubber
480269	Ultra-Twin			•	Silicone

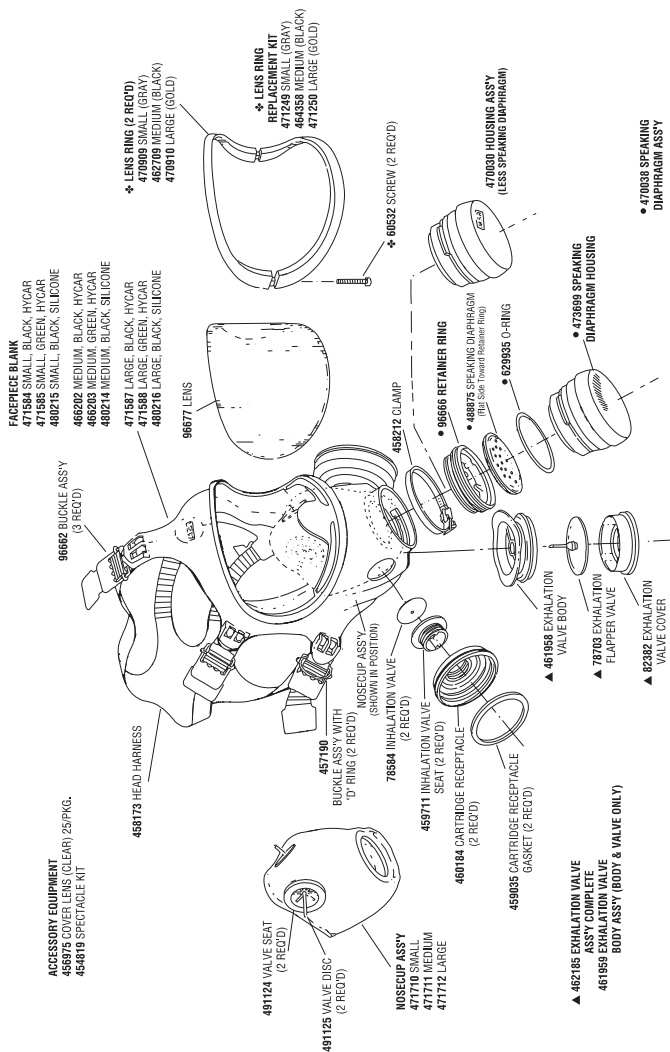
All facepieces listed above are black in color. Duo-Twin, Ultravue, and Standard Ultra-Twin Facepieces also are available in green. Ultra Elite Facepieces also are available in blue and gray. All facepieces above include both Nosecup and Speaking Diaphragm. Models also are available without Nosecup and Speaking Diaphragm. For additional part numbers contact MSA.

PROBED FACEPIECES AVAILABLE

Part No.	Type	Size			Material
		Small	Medium	Large	
471683	Ultra-Twin	•			Hycar rubber
482025	Ultra-Twin	•			Silicone
465457	Ultra-Twin		•		Hycar rubber
482024	Ultra-Twin		•		Silicone
471684	Ultra-Twin			•	Hycar rubber
482026	Ultra-Twin			•	Silicone

Probed facepieces are for use with personal sampling devices for measuring contaminant concentrations inside the facepiece. They are also for use while performing quantitative facepiece fit tests. Probed facepieces are not recognized by NIOSH as approved respirator components.

Ultra-Twin Facepiece Components



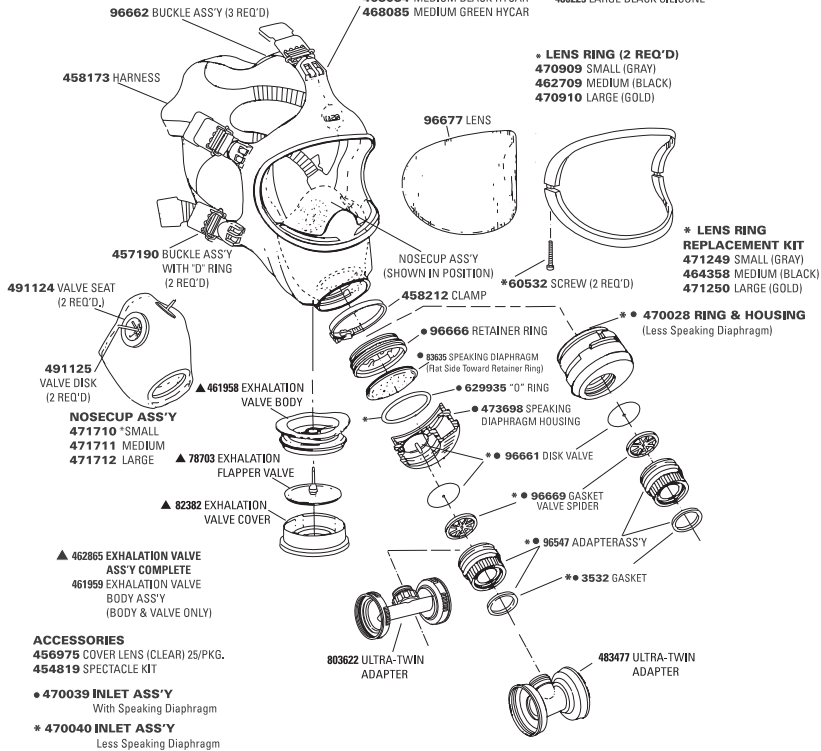
Ultravue Demand Facepiece with Ultra-Twin Adapter Components

FACEPIECE BLANK

PART NO. DESCRIPTION

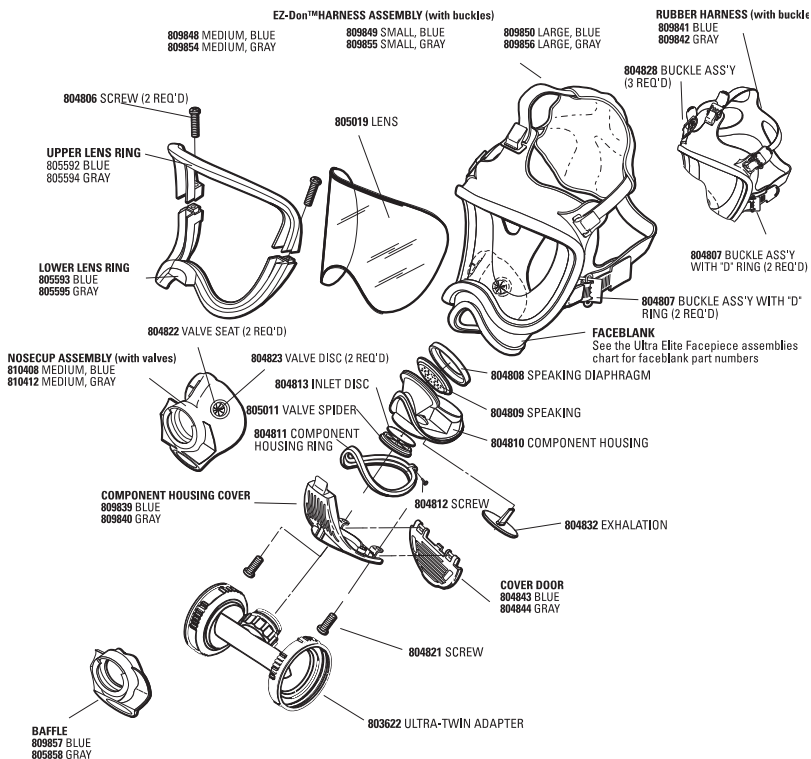
471577 SMALL BLACK HYCAR
471578 SMALL GREEN HYCAR
480224 SMALL BLACK SILICONE
468084 MEDIUM BLACK HYCAR
468085 MEDIUM GREEN HYCAR

80223 MEDIUM BLACK SILICONE
471580 LARGE BLACK HYCAR
471581 LARGE GREEN HYCAR
480225 LARGE BLACK SILICONE

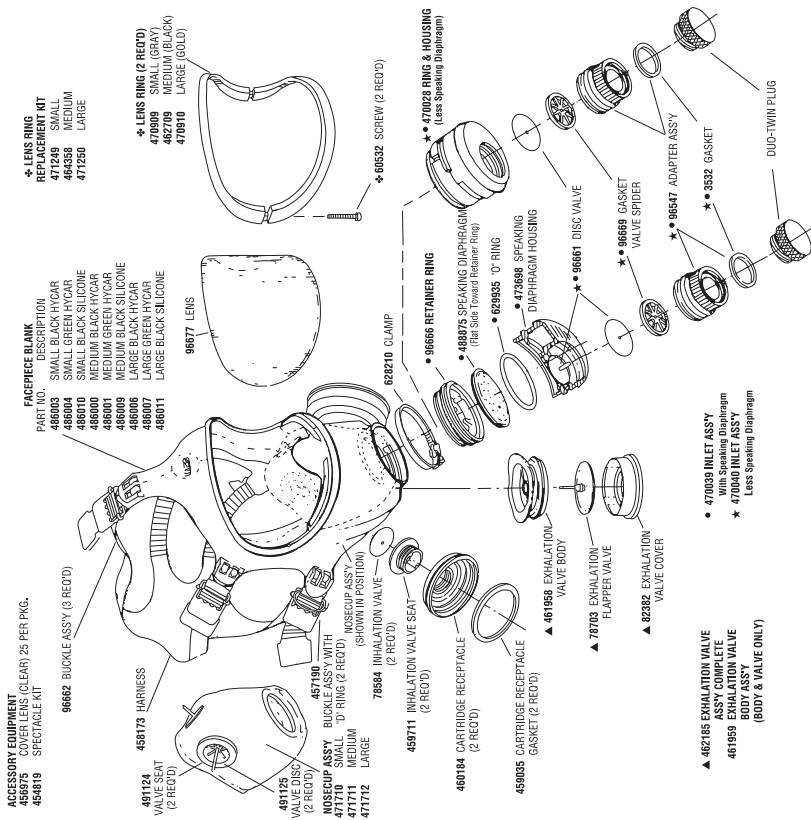


Ultra Elite Demand Facepiece with Ultra-Twin Adapter Components

Facepiece Components



Duo-Twin Constant Flow Facepiece Components with Duo-Twin Plug



Manufactured by



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