

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.

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. For any additional information relative to use or repair, write or call 1-800-MSA-5555 after working hours or during emergencies.

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



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.
- I- Contains electrical parts that may cause an ignition in flammable or explosive atmospheres.
- 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 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 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 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 user has a constant, positive check on the condition of the cartridge.

WARNING

- ¥ This device **DOES NOT** supply oxygen. Use only in adequately ventilated areas containing at least 19.5 percent oxygen.
- ¥ This respirator must be used in conjunction with the proper chemical or particulate cartridges for protection against specific contaminants.
- ¥ **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.)
- ¥ **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.
- ¥ 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.
- ¥ Use strictly in accordance with instructions, labels and limitations pertaining to this device.
- ¥ 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.
- ¥ Never alter or modify this device.
- ¥ This respirator is for use by trained and qualified personnel only.

Failure to follow this warning can result in serious personal injury or death.

RESPIRATOR USE LIMITATIONS

The user 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 , ... are the individual contaminant TLVs and C_1 , C_2 , C_3 , ... are the individual contaminant concentrations:

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

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

Note: Coupling nut P/N 96547 is needed to use the Ultra-Twin Adapters, if one is not already included with the facepiece.

1. 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

1. 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.
2. 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.

ASSEMBLING THE RESPIRATOR

Cartridges:

1. Thread cartridges into receptacles carefully.
2. Hand tighten to prevent damage to threads.

Note: 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:

1. Insert the appropriate filter into the appropriate filter cover. Never load filters into the receptacles.

2. 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. Ensure 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 steps (2) and (3).
6. Tighten forehead or “FRONT” strap a few notches, if necessary.

RESPIRATOR FIT TEST

WARNING

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

A qualitative or quantitative respirator fit test must be routinely carried out for each wearer of this respirator to determine or confirm the amount of protection that the respirator provides. The fit test method chosen may impact the maximum use concentration.

Respirator fit tests are explained fully in the American National Standard Practices for Respiratory Protection, ANSI Z88.2-1992 which is published by the American National Standards Institute, 11 West 42nd Street, New York, New York, 10036 and Occupational Safety and Health Standards, OSHA 1910.134, which is published by the Occupational Safety and Health Administration, 200 Constitution Avenue, NW, Washington DC, 20210.

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.

Replacing the Cartridges:

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.

Replacing the Filters

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

CAUTION

DO NOT use alcohol as a germicide because it may deteriorate rubber parts.

Depending on the cleaning policy adopted, either a designated person or the user should clean the respirator after each use. Non-sudsing

Confidence Plus® Cleaning Solution (P/N 10009971) from MSA is recommended. It is a germicidal cleaner that cleans and disinfects in one operation. It retains its germicidal efficiency in hard water to inhibit the growth of bacteria. It will not deteriorate rubber, plastic, glass, or metal parts. Refer to the label for use instructions. A solution as effective as Confidence Plus Cleaning Solution and compatible with MSA respirator components may be substituted. ANSI suggests that users be trained in the cleaning procedure.

⚠ WARNING

Be careful not to breathe or touch the contaminant in handling the respirator or its parts. If necessary, use equipment disposal to protect you from the specific contaminant. Failure to follow this warning can result in serious personal injury or death.

1. Preparing Solution
 - a. Follow the instructions with the Confidence Plus Cleaning Solution.
 - b. If the Confidence Plus Cleaning Solution is not used, wash in a mild cleaning solution, rinse thoroughly, and submerge in a germicide solution for the manufacturer's recommended time.
2. Clean and Disinfect the Facepiece
 - a. Remove the canister/cartridge(s) from the facepiece.
 - b. Thoroughly wash the facepiece (and nose cup) in the cleaning solution. A soft brush or sponge can be used to clean the soiled facepiece. Be sure to include cleaning the exhalation valve and seat.
 - c. Rinse the facepiece and components in clean, warm (110°F), water (preferably running and drained).

⚠ CAUTION

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

- d. Allow the facepiece to air dry. Do not dry the parts by placing them near a heater or in direct sunlight. The rubber will deteriorate.
- e. Operate the exhalation valve by hand to be sure it works properly.

- f. Harness (straps and buckles)
- g. The facepiece and components should be air-dried or hand-dried with a clean lint-free cloth.

WARNING

DO NOT force-dry the parts by placing them in a heater or in direct sunlight. The rubber will deteriorate. When facepiece is thoroughly dried, store the facepiece in the clam shell in which it was shipped.

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

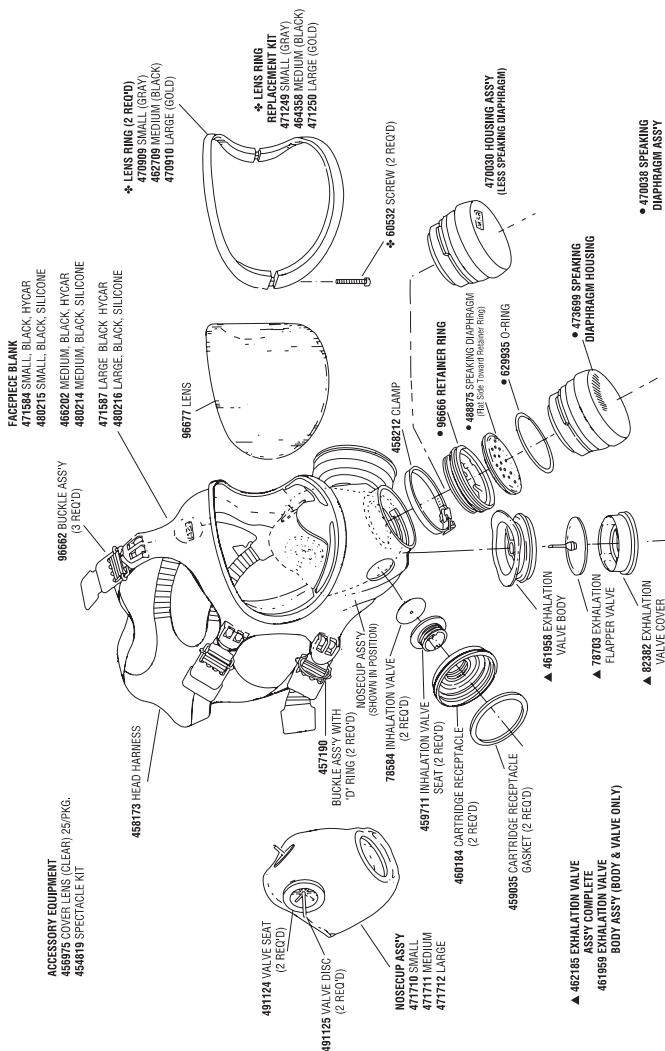
All facepieces listed above are black in color. All facepieces above include both Nosecup and Speaking Diaphragm. Models also are available without Nosecup and Speaking Diaphragm. For additional part numbers contact MSA.

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.

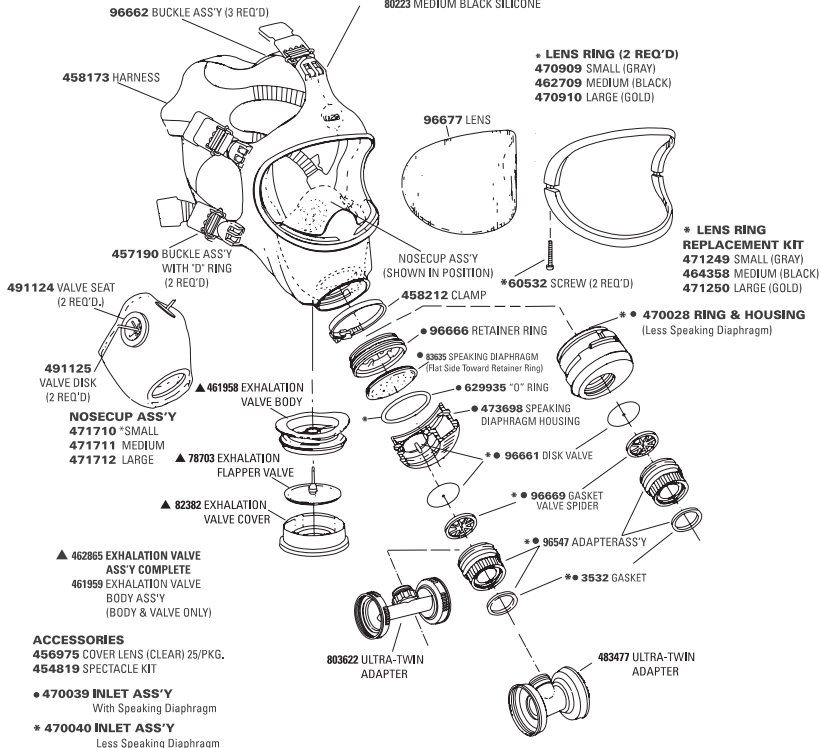
Ultra-Twin Facepiece Components



Ultravue Demand Facepiece with Ultra-Twin Adapter Components

FACEPIECE BLANK

PART NO.	DESCRIPTION
471577	SMALL BLACK HYCAR
480224	SMALL BLACK SILICONE
468084	MEDIUM BLACK HYCAR
80223	MEDIUM BLACK SILICONE
471580	LARGE BLACK HYCAR
480225	LARGE BLACK SILICONE

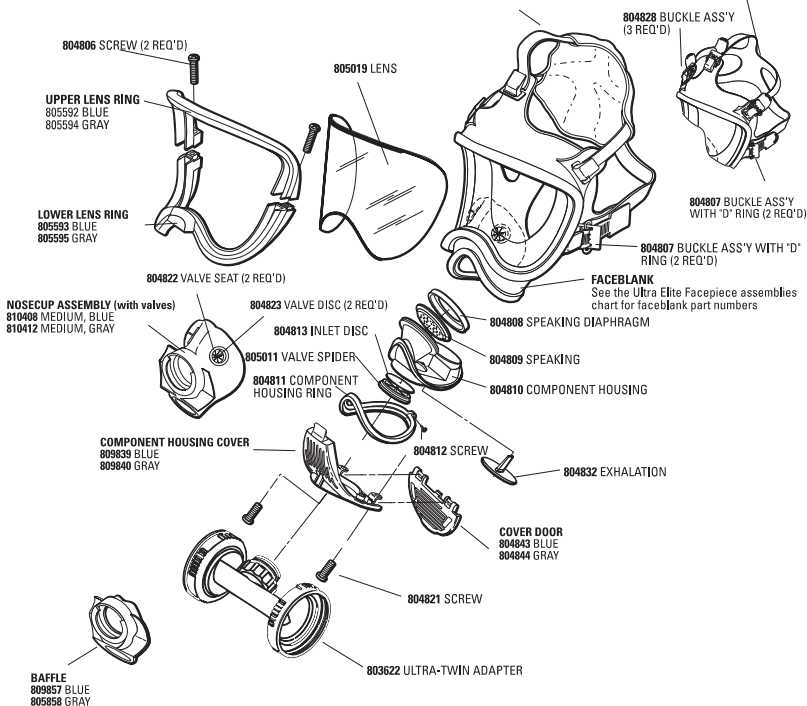


Ultra Elite Demand Facepiece with Ultra-Twin Adapter Components

Facepiece Components

493064 SMALL, HYCAR, RUBBER HEAD HARNESS
 493020 MEDIUM, HYCAR, RUBBER HEAD HARNESS
 493108 LARGE, HYCAR, RUBBER HEAD HARNESS
 491146 SMALL, HYCAR, SPEED-ON HEAD HARNESS
 491145 MEDIUM, HYCAR, SPEED-ON HEAD HARNESS
 491147 LARGE, HYCAR, SPEED-ON HEAD HARNESS

493072 SMALL, SILICONE, RUBBER HEAD HARNESS
 493028 MEDIUM, SILICONE, RUBBER HEAD HARNESS
 493116 LARGE, SILICONE, RUBBER HEAD HARNESS
 491505 SMALL, SILICONE, SPEED-ON HEAD HARNESS
 491502 MEDIUM, SILICONE, SPEED-ON HEAD HARNESS
 491508 LARGE, SILICONE, SPEED-ON HEAD HARNESS



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

