

# Versa-Hood™

## Respirator with Vortex Tube

### instructions

#### WARNING

THIS MANUAL MUST BE CAREFULLY READ BY ALL PERSONS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any other piece of complex equipment, the Versa-Hood Respirator from MSA will perform as designed only if it is used and serviced according to the instructions. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED, AND PERSONS WHO RELY ON THIS RESPIRATOR COULD SUSTAIN SERIOUS RESPIRATORY INJURY OR DEATH.

The warranties made by MSA with respect to the product are voided if the product is not installed, used, and serviced according to the instructions in this manual. 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.

Manufactured by



TAL 998 (L) Rev. 2

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

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# Cautions and Limitations/Description

## NIOSH APPROVAL INFORMATION CAUTIONS AND LIMITATIONS

- B Not for use in atmospheres immediately dangerous to life or health.
- C Do not exceed maximum use concentrations established by regulatory standards.
- D Airline respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.
- E Use only the pressure ranges and hose lengths specified in the User's Instructions.
- J Failure to properly use and maintain this product could result in injury or death.
- 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 as specified by the manufacturer.
- O Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
- S Special or critical user's instructions and/or specified use limitations apply. Refer to User's Instructions before donning.

## SPECIAL USER INSTRUCTIONS (In accordance with section "S" of the Niosh cautions and limitations)

**Do not use an airline hose length that is less than 25 feet with the 816283 and 816284 hoods.**

**The air source must provide at least 6 cubic feet per minute (cfm) to each hood, and keep the inlet pressure in the correct range for the specific flow control device selected.**

**If the pressure at any point in the supply system is higher than 125 psig, a pressure release mechanism must be installed. Failure to follow these precautions may result in serious personal injury or property damage.**

**Do not use the respirator if air contaminants are unknown, immediately dangerous to life or health, or you cannot escape without respiratory equipment. The Versa-Hood**

**Respirator does not afford protection if the air source fails.**

**Do not use the respirator as an underwater device. The respirator does not supply oxygen.**

**If exposed to contaminants which can be absorbed by the skin, wear clothing which will prevent the contaminant from contacting the skin.**

**Return to a safe atmosphere and discard the respirator immediately if discoloration, crazing, blistering, cracking or other deterioration of the respirator system are observed.**

**Remove the respirator at once if the flow of air stops or drops noticeably. Failure to do so may result in serious personal injury or death.**

**Do not don or use the respirator unless the inlet pressure matches the specifications. Reduced pressure may result in inadequate air volume in the hood. Failure to follow this precaution may result in serious personal injury or death.**

**Keep the respirator away from hot sparks and flames. Respirator materials will burn.**

**Do not use respirator if you cannot see through the lens. Pull the cover lens off when it gets dirty or scratched. Pull the tab near your left eye.**

**Do not remove the respirator in a contaminated area. The contaminant will stay in the air in the work area. Return to a safe atmosphere before removing the respirator. Failure to follow these precautions may cause inhalation of the contaminant and result in serious personal injury or death.**

## IMPORTANT NOTICE FOR RESPIRATORY PROTECTION PROGRAM ADMINISTRATORS

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 (b) (1)].
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. We encourage our customers to write or call for information on this product before using it.

3. This respirator may be used only after proper instruction and training in its use as specified in OSHA regulations [Title 29 CFR, Part 1910.134 (b) (3)].
4. This respirator may not be worn in an atmosphere which is immediately dangerous to life or health as defined in Title 30 CFR, Part 11, or from which the wearer cannot escape without the aid of a respirator. Under no circumstances should the respirator be used as an underwater device.
5. Use only with an air supply that meets ANSI (Compressed Gas Association) specifications. Air pressure and flow rates must be within the approved ranges for the device.
6. Users must wear suitable protective clothing and precautions must be taken so that the respirator is not worn in atmospheres that may be harmful to the device.
7. Do not alter, modify, or substitute any components without the approval of the manufacturer. Such alterations will void the NIOSH approval.
8. Inspect the respirator regularly and maintain it according to the manufacturer's instructions. Repairs must only be made by properly trained personnel.

## DESCRIPTION

Vortex-tube respirators are Type C, supplied-air respirators approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres not immediately dangerous to life or health:

"Not immediately dangerous to life or health" means any hazardous atmosphere which may produce physical discomfort immediately, chronic poisoning after repeated exposure, or acute adverse physiological symptoms after prolonged exposure. (Title 42 CFR, Part 84, Subpart A, Par. 84.2 (x) ).

# Assembling the Respirator

This limitation is necessary because the air-line respirator depends entirely on an air supply not carried by the wearer. If the air supply fails, the wearer is without respiratory protection and might not be able to escape safely from an IDLH atmosphere. Another limitation of air-line respirators is that the air-supply hose limits the wearer to a fixed distance from the air source. The respirator can be used in many industrial applications. Its design makes it an economical device where a disposable respirator is desirable. A cover lens is provided to extend the "life" of the respirator. The cover lens is simply peeled off when it becomes contaminated, and the primary lens is then used. When this lens becomes contaminated, the entire hood is removed, disassembled, and a new hood is attached to the hood tube. The suspension is kept for use with the new hood.

The Versa-Hood respirator consists of a loose-fitting hood (shoulder- or waist-length), hood suspension, hood tube, a support belt, a flow control device and an air-supply hose. An optional protective cap may be ordered separately if head protection is required. An optional chin strap also is available.

The Versa-Hood respirator is a constant-flow, air-line device. This means that an air-supply hose delivers a continuous flow of compressed, respirable air to the respirator.

Accessory equipment, such as pressure regulators, pressure gauges, or air-line filters may be necessary to ensure that the air is at the proper pressure. Many in-plant installations require an air purifier and/or monitoring system to ensure that the air source is respirable. An accessory air filter is available from MSA which removes particulates and nuisance odors. Air-line monitors also are available from MSA.

To maintain the NIOSH approval, the user must provide respirable quality air at the correct inlet pressure; use the proper length of approved air-supply hose and fittings; and use the device and maintain it according to the instructions in this manual.

## RESPIRATOR USE LIMITATIONS

The wearer must not exceed any of 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 contaminant present.  
Exception: when equipped with aerosol filters the respirator may be used for escape from an unlimited concentration of particulates.
  - b. 1,000 parts per million organic vapors (for organic vapor respirators).
  - c. Immediately dangerous to life or health (IDLH) concentration for the contaminant.
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 organic vapors with poor warning properties or those which generate high rates of reaction with sorbent material in the cartridge (for organic vapor respirators).

## UNPACKING AND INSPECTION

Remove the respirator from the packing. Thoroughly inspect all components of your air-line respirator. In many cases, you will not be the first to handle the respirator. The respirator may be fully assembled when you receive it. Whether the respirator is pre-assembled or unassembled in the packing container, check that all parts are in place. Inspect the entire respirator to be sure no parts are damaged. If the respirator is assembled, go on to **DONNING THE RESPIRATOR**.

## ASSEMBLING THE RESPIRATOR

### General Assembly (all models)

Remove the hood from the container. Unroll the hood. Be careful not to damage the lens or lose the plastic hose clamp (cable tie) included with the hood.

### Inserting the Liner into the Hood

1. Insert the foam liner P/N 497349 into one of the air outlets inside the hood. The tape on the liner should face inside the hood.



2. Reach into the other outlet and pull the liner through until equal amounts of liner extend from each outlet.



3. Remove the facing from the adhesive and fasten the liner to the hood.



# Assembling the Respirator

## Assembling the Hood Tube to the Hood

1. Push the tube into the hood inlet port so that the end of the muffler is about 1 inch inside the hood.



2. Fold any extra hood material around the tube.
3. Line up the plastic hose clamp so the grooves are against the hood material.
4. Pull the plastic clamp for a firm, hand-tight fit.



Do not over-tighten or the hood tube will collapse. Cut off any extra clamp material.

### WARNING

**Do not don the respirator until you have completed all of the assembly steps required for your respirator. Different respirator models need different inlet air pressures. Failure to follow this precaution may result in inadequate air flow to the respirator and may cause serious injury or death.**

## NOTE

The hood suspension should be adjusted before it is installed

## Adjusting the 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. See assembling the Optional Chin Strap, below.

1. Insert the suspension into the hood.
2. Turn the suspension so that the sweatband faces the hood lens.
3. Attach the three Velcro strips on the suspension to the three strips inside the hood.



## Assembling the Optional Chin Strap

The chin strap must be attached to the hood suspension before the suspension is installed in the hood. To install the chin strap:

1. Insert one end of the chin strap in the slot located at the side of the suspension.
2. Insert the other end of the strap in the slot on the other side.



## Assembling the Respirator to an Optional Protective Cap

## NOTE

If a protective cap is to be worn, it must be from MSA. Only the cap from

# Filter Cartridge Assembly

MSA is equipped with proper adapters to secure the hood to the cap. Any other cap voids the NIOSH approval.

1. Adjust the cap suspension to the head size desired, following the instructions supplied with the cap.
2. Insert the cap into the hood.
3. Turn the cap so that the brim is pointed toward the hood lens.
4. Attach the Velcro strips to the pads in all three places on the cap (at both lug slots and the back).



## Assembling the Respirator to the Air Source

1. Remove the quick-disconnect socket from the vortex tube. Attach the threaded end of the quick-disconnect socket to the air-supply hose, using wrenches or slip-joint pliers.



2. Connect the opposite end of the air-supply hose to a respirable air source. An air-line inlet pressure gauge is available from MSA. The pressure gauge should be installed at the point where the air-supply hose is connected to the air source.



It is important that the approved air pressure is maintained at the inlet to the hose (not just at the compressor) to assure adequate air flow.

### ⚠ WARNING

**This system must be supplied with respirable air meeting quality verification level (Grade) D is specified by the compressed gas association - specification G-7.1. Failure to follow this precaution may result in serious personal injury or death.**

3. Be sure that inlet air pressure is set to agree with your flow control device. Use the information below as a guide.

### ⚠ WARNING

**The air source must provide at least 6 cubic feet per minute (cfm) to each hood, and keep the inlet pressure in the correct range for the specific flow control device selected.**

**If the pressure at any point in the supply system is higher than 125 psig, a pressure release mechanism must be installed. Failure to follow these precautions may result in serious personal injury or death.**

**Do not use an airline hose length that is less than 25 feet with the 816283 and 816284 hoods.**

A maximum of 12 sections of air-supply hose may be used in making up the maximum working length of hose. The coiled hoses are considered to be the indicated length, although actual extended lengths can be less.

To reattach the quick-disconnect socket to either adjustable- or non-adjustable valve-connectors, temporarily don the support belt. Push the socket on the vortex tube plug end until it snaps in place. Pull slightly on the air-supply hose to be sure the connection is secure.



## Cold Vortex Tube

Approved air-supply hose: 3/8" only; length: 8 - 300 ft. Approved inlet air pressure required to maintain at least 6 cfm to each respirator: 75 - 90 psig.

## Warm/Cool Vortex Tube

Approved air-supply hose: 3/8" only; length: 8 - 300 ft. The approved inlet air pressure required to maintain at least 6 cfm to each respirator is listed below:

| Hose Length    | Pressure Range |
|----------------|----------------|
| 8 - 100 feet   | 85 - 95 psig   |
| 100 - 200 feet | 95 - 110 psig  |
| 200 - 300 feet | 110 - 120 psig |

## FILTER CARTRIDGE ASSEMBLY INSTRUCTIONS

The filter cartridge holder is approved for use with the Vortex tube respirator when equipped with:

GMA cartridges approved for respiratory protection against not more than 1000 ppm organic vapors. Available in packages of 10.

Type H cartridge approved for respiratory protection against dusts, mists, and fumes having a TWA less than 0.05 milligrams per cubic meter, and radionuclides. Available in packages of 10.

# Donning the Respirator

Filter cartridges are used to remove slight odors from gases or vapors or to remove dusts, mists, and fumes that may be in the air supply.

When odors of vapors or gases become noticeable, or when breathing resistance becomes uncomfortable, the cartridge must be replaced. Filter cartridges should be checked for flow resistance using the Filter Resistance Tester.

Install filter cartridges in the cartridge holder as follows:

1. Unscrew the bezel ring.
2. Separate the holder halves.
3. Screw the filter cartridge in until it is firmly seated on the gasket.



4. Place the holder halves together and tighten the bezel ring to ensure a good seal at the gasket.



Connect the cartridge holder (with filter cartridge installed) to the respirator as follows:

1. Disconnect the breathing tube from the valve-connector or vortex tube.
2. Connect the cartridge holder female fitting to the valve-connector or vortex tube.

3. Connect the breathing tube coupling nut to the cartridge holder male fitting.



4. Position the cartridge holder comfortably on your hip.
5. Turn the air source on. Check for leaks with a commercial leak-test solution or soapy water. Tighten connections as required, using wrenches or slip-joint pliers. Turn the air source off.

## DONNING THE RESPIRATOR

1. If the respirator lens has a paper cover, it must be removed before the respirator is donned.

### CAUTION

**Do not remove the special clear cover lens until it becomes contaminated. The cover lens extends the life of the hood.**

2. Turn air source on. Be sure the air source pressure and flow match the requirements of the flow control device used. The hose length and pressure required are on the flow control device or its holder.

### WARNING

**Do not don or use the respirator unless the inlet pressure matches the specifications. Reduced pressure may cause inadequate air volume in the hood. Failure to follow this precaution may result in serious personal injury or death.**

3. Don the support belt. Check for a gasket in the hood tube coupling nut.



4. Thread the hood tube coupling nut on the cartridge holder and hand-tighten.



5. Grip the hood and knit collar between your fingers with both hands. Stretch the collar and pull the hood over your head.



6. Put the suspension on your head.
7. Center the lens for your best vision.

# Maintaining the Respirator

8. Secure the chin strap (optional accessory) under your chin.
9. Straighten the knit collar for a good fit around your neck.
10. Waist-length hood only: Attach tie-downs around your waist. Use a slip knot in case the air flowing to the hood stops. You are now ready to use the respirator.



## ⚠ WARNING

Remove the hood and return to fresh air immediately if air flow stops or breathing becomes difficult. Failure to follow this precaution may result in serious personal injury or death.

### ADJUSTING TEMPERATURE ON COOL VORTEX TUBES

1. For minimum cooling, fully turn the adjusting valve clockwise.
2. Rotate the adjusting valve counter-clockwise until a comfortable temperature is reached.
3. For maximum cooling, turn the valve fully counter-clockwise (approximately 3-1/2 turns). The adjusting knob may vary air flow but cannot reduce flow below the required minimum 6 cfm rate when the proper pressure is used at the inlet of the MSA air-supply.

### ADJUSTING THE TEMPERATURE ON WARM/COOL VORTEX TUBES

1. Using the lever, rotate the temperature adjustment collar to provide a comfortable temperature.
2. For maximum warmth, rotate the collar clockwise. For maximum cooling, rotate the collar counter-clockwise.

## ⚠ WARNING

**Do not use the respirator if air contaminants are unknown, immediately dangerous to life or health, or you cannot escape without respiratory equipment. The Versa-Hood respirator does not afford protection if the air source fails.**

**Do not use the respirator as an underwater device.**

**If exposed to contaminants which can be absorbed by the skin, wear clothing which will prevent the contaminant from contacting the skin.**

**Return to a safe atmosphere and discard the respirator immediately if discoloration, crazing, blistering, cracking, or other deterioration of the respirator system are observed.**

**Remove the respirator at once if the flow of air stops or drops noticeably.**

**Keep the respirator away from hot sparks and flames. Respirator materials will burn.**

**Do not use the respirator if you cannot see through the lens. Pull the cover lens off when it gets dirty or scratched. Pull the tab near your left eye.**

**Do not remove the respirator in a contaminated area. The contaminant will stay in the air in the work area. Return to a safe atmosphere before removing the respirator. Failure to follow these precautions may cause inhalation of the contaminant and result in serious personal injury or death.**

### Removing the Lens

Remove the cover lens when it gets too dirty for acceptable vision.

1. Pull on the loose tab near your left eye.
2. Hold the hood in place with your other hand as you pull.



### Removing the Respirator

1. Release the chin strap if used.
2. Waist-length model: Untie the waist tie-downs.
3. Lift the back of the hood over your head.



4. Remove the support belt.
5. Turn the air source off.
6. Hang the respirator up to prevent damage to the lens or hood material.

### MAINTAINING THE RESPIRATOR

Regular maintenance is necessary to assure proper protection. Maintenance includes inspection of all parts of the respirator and parts replacement as necessary. NIOSH approvals require regular inspection and maintenance. Worn or damaged parts must be replaced. See the parts list for correct replacement numbers.

## ⚠ 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.**

# Maintaining the Respirator

**Otherwise, you could sustain serious personal injury or death.**

## Component Inspection

Only trained personnel are to maintain the respirator. Use only genuine MSA parts. Do not make repairs or design modifications other than as recommended by MSA or the NIOSH approval will be voided. Inspect the respirator after each use.

Perform the following inspection checks:

1. Check the hood tube for wear and cracking.



2. Be sure the plastic clamp holding the tube to the hood is secure.
3. Be sure that you can see clearly through the lens.

4. On models which use the adjustable or non-adjustable valve-connector, be sure that there is a gasket in the breathing tube coupling nut.



5. Inspect the flow control device to be sure it is operating properly.
6. Check that the quick-disconnect snaps into place and releases properly.
7. Be sure that the support belt is in good condition.
8. Check the hood (or cap) suspension to be sure it is installed correctly.
9. Reassemble the respirator. Follow the instructions which apply to your model only. See Assembling the Respirator.
10. Inspect the air-supply hose for tears, cracks or other damage.

11. Store the respirator in a cool, dry place, out of direct sunlight.

## Replacing the Hood Material

1. Cut the plastic clamp using scissors or wire cutters.



2. Pull the hood tube and suspension out of the hood. Save them.
3. Discard the used hood material.
4. Assemble the hood tube to the new hood material. See Assembling the Respirator, page 3. Follow the instructions which apply to your particular model only.

# Accessories

## ACCESSORIES

**The Constant Flow Air-Line Filter** provides high-efficiency filtration of compressed-air lines. The filter removes a minimum of 99 percent of particulates measuring 0.3 micron or larger. These include dusts, mists, fumes, smokes, and petroleum vapors. A chemical cartridge removes organic vapors. The filter can be used at inlet pressures up to 125 psig. The pressure drop is 1 psig at a maximum rated air flow of 25 scfm. This accessory does **not** remove carbon monoxide (CO).



**The Constant Flow Air-Line Pressure Regulator** reduces inlet pressure to the desired operating pressure. The pressure regulator maintains pressure on the outlet side until it is readjusted.



\*Velcro is a registered trademark of Velcro, Inc.

## VERSA-HOOD™ RESPIRATOR with VORTEX-TUBE Complete Assemblies (FOR USE WITH AIR-SUPPLY HOSE)

| Part No. | Description                                                                           |
|----------|---------------------------------------------------------------------------------------|
| 494424   | Shoulder-length hood, with Snap-Tite (AL) quick-disconnect and Cool vortex tube.      |
| 494425   | Shoulder-length hood, less quick-disconnect and with Cool vortex tube.                |
| 494426   | Waist-length hood, with Snap-Tite (AL) quick-disconnect and Cool vortex tube.         |
| 494427   | Waist-length hood, less quick-disconnect, with Cool vortex tube.                      |
| 495781   | Shoulder-length hood, with Snap-Tite (AL) quick-disconnect and Warm/Cool vortex tube. |
| 495782   | Shoulder-length hood, less quick-disconnect, with Warm/Cool vortex tube.              |

### Replacement Parts

|        |                                              |
|--------|----------------------------------------------|
| 482612 | Replacement hood - Tyvek (shoulder-length)   |
| 482610 | Replacement hood - Tyvek (waist-length)      |
| 816284 | Replacement hood - Saranex (shoulder-length) |
| 816283 | Replacement hood - Saranex (waist-length)    |
| 473902 | Support Belt (pvc)                           |
| 482703 | Hood tube                                    |
| 455019 | Socket assembly (Snap-Tite)                  |
| 66273  | Plug (Snap-Tite) for 3/8" hose               |
| 467044 | Socket assembly (Foster)                     |
| 56549  | Plug (Foster)                                |
| 3532   | Gasket (hood coupling nut)                   |

### 3/8" Neoprene Air-Supply Hose Assemblies

|        |               |
|--------|---------------|
| 481071 | 8 ft. length  |
| 455020 | 15 ft. length |
| 455021 | 25 ft. length |
| 455022 | 50 ft. length |

### 3/8" PVC Air-Supply Hose Assemblies

|        |                |
|--------|----------------|
| 481051 | 8 ft. length   |
| 471511 | 15 ft. length  |
| 471512 | 25 ft. length  |
| 471513 | 50 ft. length  |
| 484225 | 100 ft. length |

## ACCESSORIES

|        |                                                        |
|--------|--------------------------------------------------------|
| 81857  | Air-Line filter assembly                               |
| 484923 | Replacement filter group (for air-line filter)         |
| 476734 | Pressure gauge assembly (Snap-Tite plug) for 3/8" hose |
| 484735 | Pressure gauge assembly (Foster plug) for 3/8" hose    |

### Hats and Suspensions from MSA

|        |                                                                     |
|--------|---------------------------------------------------------------------|
| 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                                  |
| 816611 | Replacement ratchet suspension                                      |
| 484319 | Optional chin strap (elastic)                                       |
| 484320 | Optional chin strap (cotton webbing)                                |

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Manufactured by



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