

OCENCO M-20.2
Self-Contained Self-Rescuer
Emergency Escape Breathing Device
INSTRUCTION MANUAL

Manual No: NH22050
Revision F, ECN 2760

WARNINGS AND CAUTIONS

WARNINGS

- 1) **WEARERS MUST BE FULLY TRAINED IN THE USE AND CARE OF THE EQUIPMENT.**
- 2) **INDIVIDUAL WARNINGS MUST BE STRICTLY ADHERED TO WHICH, IF NOT, IT COULD RESULT IN INJURY AND OR DEATH OF PERSONNEL.**
- 3) **THE M-20.2 EEBD MUST NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED IN THIS MANUAL.**
- 4) **THE M-20.2 EEBD IS NOT TO BE USED UNDERWATER.**

CAUTIONS

- 1) **THE M-20.2 EEBD MUST BE REGULARLY INSPECTED TO ENSURE OPERATIONAL READINESS.**
- 2) **IF THE M-20.2 EEBD FAILS ANY OF THE INSPECTIONS, REMOVE THE UNIT FROM SERVICE IMMEDIATELY.**
- 3) **REMOVE THE UNIT FROM SERVICE IF THE TAMPER BALL IS MISSING.**
- 4) **THE FLOW OF OXYGEN WILL BEGIN AUTOMATICALLY WHEN THE UNIT IS REMOVED FROM IT'S BASE. YOU SHOULD NOT EXPECT TO HEAR THE FLOW OF OXYGEN OR SEE THE BREATHING BAG INFLATE.**

SECTION 1

CLASSIFICATION OF THE M-20.2 EEBD

The Ocenco M-20.2 is a belt worn or stored, compressed-oxygen, Emergency Escape Breathing Device (EEBD). The M-20.2 EEBD instantly provides breathable air, independent of the surrounding atmosphere, to a person escaping from any area of toxic gas or oxygen deficiency.

The M-20.2 EEBD meets or exceeds the EEBD requirement for confined spaces onboard ships in the United States Navy, the 10 minute self-contained closed circuit breathing apparatus requirement for escape from confined space, and the EEBD requirement for use in maritime shipboard confined spaces as required in the SOLAS Convention.

SECTION 2

METHOD OF OPERATION

Oxygen automatically and continuously flows from the cylinder to the breathing bag when the unit is pulled from the base.

During inhalation, and whenever the bag flattens, the oxygen regulator increases the oxygen flow into the breathing bag.

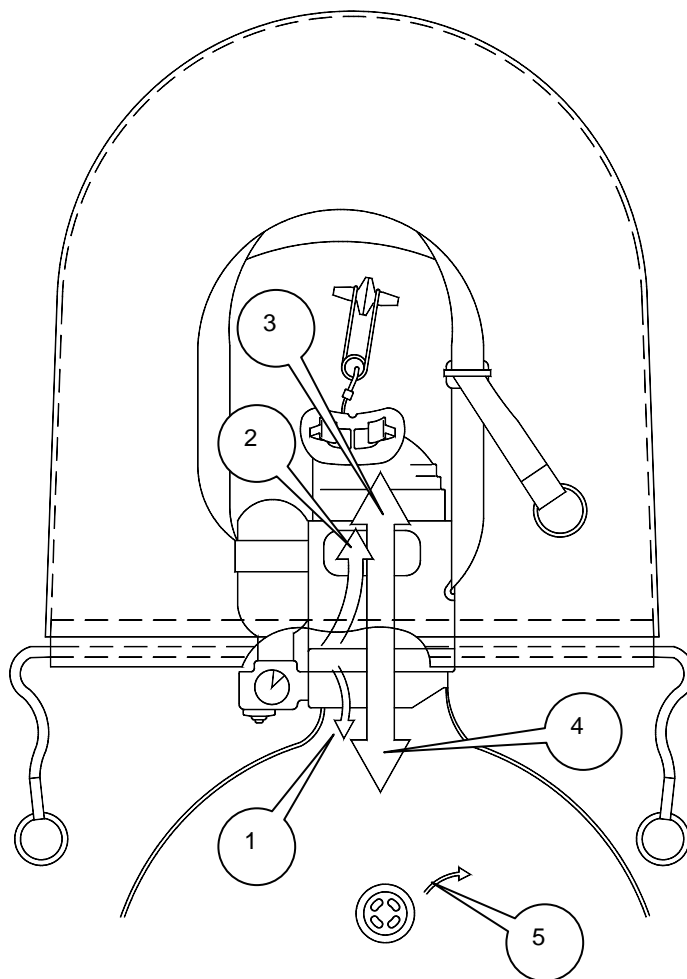
During inhalation, oxygen passes from the breathing bag through the scrubber and into the mouthpiece.

During exhalation, carbon dioxide laden air is exhaled through the scrubber and then into the breathing bag.

During inhalation and exhalation, carbon dioxide is absorbed by the lithium hydroxide scrubber.

Occasionally, during low work rates, the oxygen regulator supplies more oxygen than the user can consume. When this occurs, the excess gas automatically vents through the relief valve.

The starting of the oxygen flow, the increased flow rate during high work rates, and the occasional venting of gas through the relief valve, all occur automatically: the user needs only to breathe.



1. Constant Flow of Oxygen
2. Demand Flow of Oxygen
3. Inhalation
4. Exhalation
5. Relief Valve Exhaust

SECTION 3

DONNING PROCEDURE

The following are the donning steps for the stored configuration of the M-20.2 EEBD. These six steps must be practiced numerous times until they become second nature.

1 REMOVE EEBD FROM ORANGE CASE

2 LIFT YELLOW LEVER AND DISCARD COVER



3 REMOVE UNIT BY PULLING YELLOW NECK STRAP UPWARDS



4 INSERT YELLOW MOUTHPIECE



5 FIT YELLOW NOSE CLIP



6 INHALE THROUGH MOUTH AND ESCAPE

ADJUST YELLOW NECK STRAP AND DON FACE SHIELD IF NEEDED

To fit the neck strap, simply place the neck strap over the head and pull upward on the o-ring to shorten the neck strap.

To fit the face shield, simply pull the face shield over the head and pull outward on the o-rings to tighten the face shield around the neck.

In the unlikely event that moisture on the inside of the face shield distorts your vision, simply press or rub the face shield against the face with your hand.

CAUTION: The flow of oxygen will begin automatically when the unit is removed from its base. You should not expect to hear the flow of oxygen or see the breathing bag inflate.

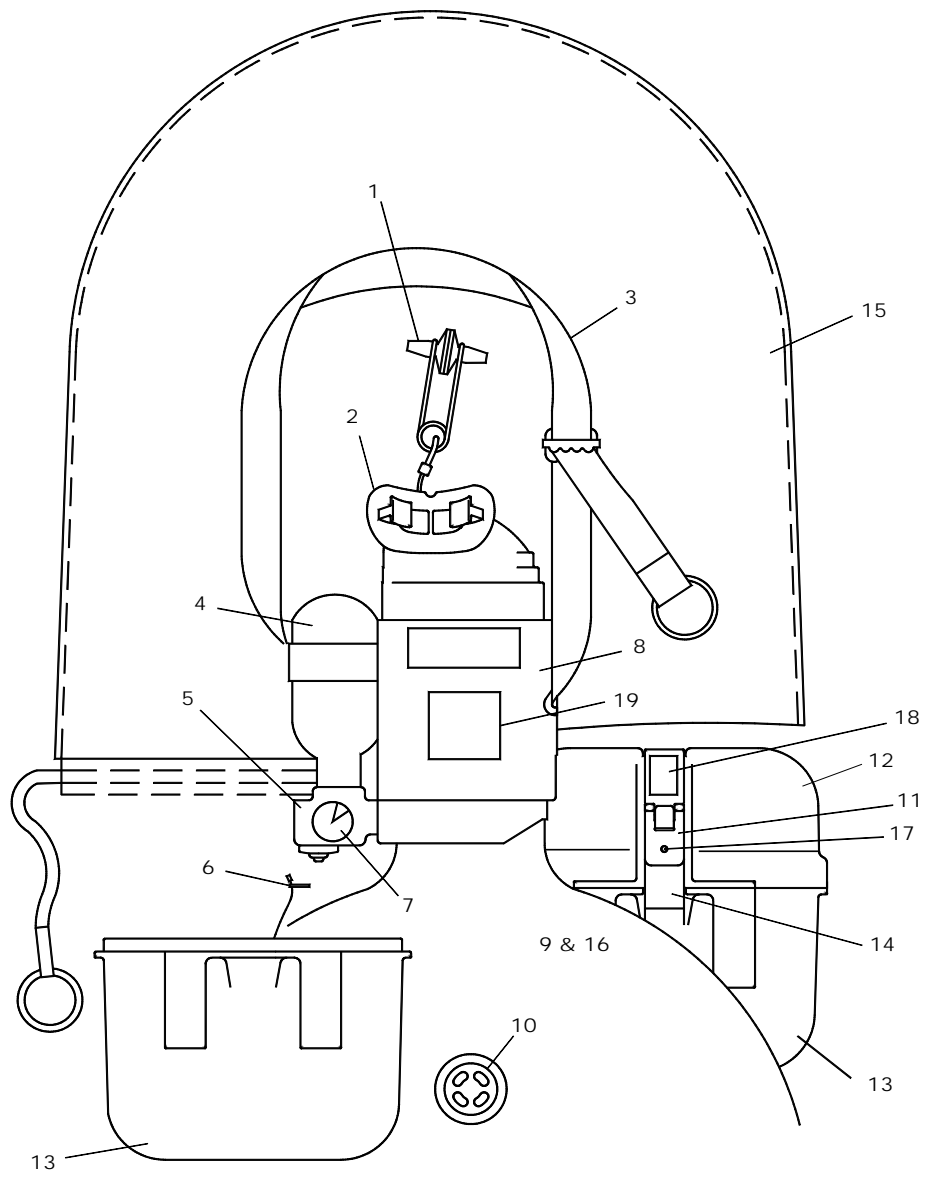
SECTION 4

COMPONENTS

Please refer to the illustration of components on next page:

1. **Nose Clip:** the yellow nose clip is attached to the mouthpiece and is used to close the nasal passage during use of the EEBD.
2. **Mouthpiece:** the yellow mouthpiece is placed in the mouth such that the flange seals between the lips and gums. The bits should be between the upper and lower teeth. Gently bite on the bits.
3. **Neck Strap:** the yellow neck strap is to be placed over the head for support and can be adjusted for fit.
4. **Oxygen Cylinder:** the stainless steel cylinder holds 100% medical grade oxygen.
5. **Oxygen Regulator:** starts the flow of oxygen and increases the oxygen flow during high work rates.
6. **Activation Cable:** the stainless steel activation cable is attached to the oxygen regulator and permanently attached to the inside of the base.
7. **Gauge:** indicates the amount of oxygen in the cylinder. The green zone indicates the M-20.2 EEBD is ready for use. The red zone indicates the cylinder is low on oxygen and should be removed from service. The gauge is visible through the clear case and the orange secondary container.
8. **Scrubber:** a chamber containing lithium hydroxide that removes carbon dioxide from the exhaled air.
9. **Breathing Bag:** air reservoir that receives oxygen from the regulator and exhaled air from the user.
10. **Relief Valve:** a one way valve that automatically allows excess air in the breathing bag to vent.
11. **Yellow Latch Lever:** the yellow latch lever is lifted upwards to open the M-20.2 EEBD.
Only lift Latch during emergency use.
12. **Cover:** the cover has an integral yellow tab, when lifted, releases any possible vacuum which may have developed due to change in atmospheric pressure.
13. **Base:** features integral belt loops. If belt worn, the base stays on the belt after the M-20.2 EEBD has been removed from the case. The base has an overcase that provides increased abrasion and impact resistance.
14. **S-Hook:** the metal hook that receives the cover latch on the belt side.
15. **Face Shield:** in the event the user requires head protection from smoke or chemical vapor, the face shield may be pulled up over the head and secured around the neck by pulling outward on the draw strings. This should be done only after inserting the mouthpiece and applying the nose clips.
16. **Bag Shield:** a cover providing additional protection to the breathing bag, to protect against heat, punctures or chemicals.
17. **Tamper Indicating Ball:** the presence of a stainless steel ball bearing located in the center of the yellow lever assures that the unit has not been opened.
Unit must be removed from service if the Tamper Ball is missing.
18. **Band Label:** is a user completed label indicating the commencement date of belt worn service.
19. **Information Label:** contains the following information:

MFG Date: XX/XX	the date of manufacture as month/year
Life Date: XX/XX	the end of service life date as month/year
Serial No.: X123456	the traceable serial number of the M-20.2 EEBD



SECTION 5

SPECIFICATIONS

Duration

- 10 minutes, US 42 CFR 84, Dept. of Health and Human Services, NIOSH
- 10 minutes, European Standard EN400, EC mark CE0194/EN400
- 15-18 minutes, U.S. Navy Test Protocol, Naval Surface Warfare Center.
- 32 minutes, at rest, as determined by US 42 CFR 84 mantest number 5

Dimensions

6.9 x 16.7 x 15.5 cm (2.75 x 7.0 x 6.1 in)

Weight

- 900 grams, breathing apparatus only (2.0 lb.)
- 1410 grams, with case and overpads (3.1 lb.)

Storage temperature

- Minimum: 10° F (-12.2° C)
- Maximum: 149° F (65° C)

SECTION 6

SERVICE LIFE

Service Life: The M-20.2 may remain in service for fifteen years from the date of manufacture, provided the conditions of use are observed.

The M-20.2 must be either stored or belt worn, according to the conditions of use, throughout its service life. The M-20.2 may be deployed in the belt worn configuration for 5 continuous years during its 15 year service life.

After the M-20.2 has been deployed in the belt worn configuration for 5 continuous years, it may be stored for the remainder of the service life, or it may be returned to Ocenco Incorporated to be refurbished. After the M-20.2 has been refurbished by Ocenco, it may be re-deployed in the belt worn configuration for 5 years.

Conditions of Use:

- (1) The visual inspections described in this manual must be performed.**
- (2) Proper care described in this manual must be performed.**
- (3) When stored, the M-20.2 EEBD must be contained in an Ocenco, Incorporated Secondary Container, (P/N648000), and then placed in a rigid bracket securely fastened to a wall or other substantial structure.**
- (4) If belt worn, the M-20.2 EEBD must be worn on the person and initial date of use recorded on the Band Label.**
- (5) The M-20.2 EEBD is not to be shoulder carried in the Secondary Container. Use of the Secondary Container strap is intended for emergency egress only.**

SECTION 7

DURATION

Five factors affect the duration of the M-20.2 EEBD:

1. The amount of work required to escape affects the duration. Low ceilings, steep inclines or ladders, and irregular floors increase the work required to escape. Less work results in greater duration.
2. The physical condition or "fitness" of the user affects the duration. A high heart rate, age and high percent of body fat decrease the fitness of the subject. The more fit the user, the greater the duration.
3. Regardless of the "fitness" of the user, the amount of oxygen required is proportional to the user's weight. The less the user weighs, the greater the duration.
4. The user's breathing rate affects the duration. The rate can be increased by excitement and fear. The lower the breathing rate, the greater the duration.
5. The degree of training and familiarity can affect the duration. The more training and experience the subject has with the M-20.2 EEBD, the more his breathing will be calm and controlled. If a subject is familiar with a particular escape-way it may improve the mechanics of his escape. The greater the training and familiarity, the greater the duration.

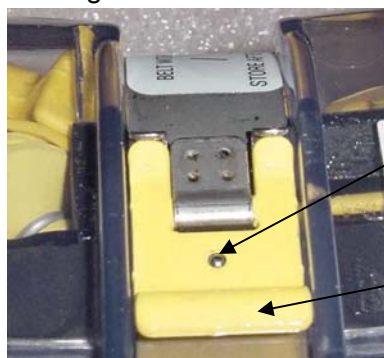
SECTION 8

HOW TO INSPECT THE M-20.2 EEBD

The inspections for the M-20.2 EEBD are visual. DO NOT lift the yellow latch or open the clear case to inspect the M-20.2 EEBD.

The inspections described below shall be performed on each M-20.2 EEBD upon deployment. Subsequently, if the M-20.2 EEBD is belt worn, the inspection shall be performed at the beginning of each work shift that the device is worn. If stored, the following visual inspections should be conducted every year:

1. Presence of Tamper Indicating Ball on the latch lever.



Tamper Indicating Ball

Yellow Latch Lever
***ONLY lift for
emergency escape use.***

WARNING: DO NOT use unit if Tamper Indicating Ball is missing or Latch has been opened. Remove unit immediately from service if the unit has been tampered with or if Tamper Indicating Ball is missing. Lifting Yellow Latch Lever voids the warranty.

2. Read the Pressure Gauge: The tip of the needle on the gauge is normally in the green zone. If the needle is in the red or on the white zero pressure mark, remove the M-20.2 EEBD from service immediately. If the view of the gauge is obstructed, the M-20.2 EEBD must be removed from service. If the surrounding air temperature is above 120°F (49°C) and the needle is above the green zone, the unit can remain in service. The needle should return to the green zone when unit is removed from the high temperature.

3. Visually inspect the apparatus for indications of high force impacts. Indications of high force impacts are listed below. If any of these signs are present the M-20.2 EEBD must be removed from service:
 - Case cracked, burned, deformed or excessively worn.
 - Excessive gap between the Cover and Base.
 - Damaged Latch or Cover Band.
 - Dirt, debris or moisture visible through the gauge window.
 - Broken belt loops.
4. Ensure that the M-20.2 EEBD has not exceeded the life date printed on the information label.
 - Ensure belt worn period (5 consecutive years) has not expired.

WARNING: If the M-20.2 EEBD fails any of the above inspection or if at any time during it's life the pressure gauge is out of the green zone or the indications of force impacts are observed, the unit should be removed immediately from service.

SECTION 9

HOW TO CARE FOR THE M-20.2 EEBD

Your life may depend on the care you give your M-20.2 EEBD. Avoid the most common abuses:

1. If the M-20.2 EEBD is accidentally opened, do not close it. Remove from service.
2. Do not drop the M-20.2 EEBD, particularly when taking off the belt to which it is attached.
3. Do not clean the M-20.2 EEBD with anything other than a soft brush (only outside case)
4. Do not immerse the M-20.2 EEBD in water
5. Do not sit on the M-20.2 EEBD.
6. Do not drag the M-20.2 EEBD on the ground.
7. Do not place the M-20.2 EEBD near heat greater than 149°F (65°C).
8. Do not put tape or stickers on the M-20.2 EEBD that would impede its opening or the reading of the gauge.

SECTION 10

WHEN TO USE THE M-20.2 EEBD

The M-20.2 EEBD should be used immediately at the first indication of a fire or explosion, even if smoke is not visible. Carbon monoxide is odorless and colorless. You could breathe a fatal amount of carbon monoxide before smoke is present. If you suspect an oxygen deficient atmosphere, put on the M-20.2 EEBD. Don't wait! Some of the possible indications of an emergency are:

1. Sight of smoke
2. Smell of smoke
3. Sight of fire
4. Fire or toxic gas alarm
5. Sudden increase of air temperature
6. Sound of an explosion
7. Vibrations of an explosion
8. Interruption of air flow
9. Someone around you has difficulty breathing or passes out

In the event of an emergency, always don your M-20.2 EEBD before attempting to escape or help others.

SECTION 11

DISPOSAL AND RETURN INSTRUCTIONS

Safe disposal is necessary after the M-20.2 EEBD has been used, fails inspection, or has exceeded the fifteen year service life. Expended Ocenco EEBDs must be disposed of in accordance with hazardous material disposal regulations. The units can be returned to Ocenco with a Return Material Authorization (RMA) obtained from Ocenco.

Section 12

M-20.2T TRAINER INFORMATION

Note: *The M-20.2T Trainer is identified by a blue secondary container and a blue scrubber.*

WARNING: *The M-20.2T Trainer provides NO protection from hazardous atmospheres and is to be used for training purposes only.*

WARNING: *It is critical that the M-20.2T Trainer be segregated from regular work spaces so it is not mistaken for an actual M-20.2 EEBD unit.*

The M-20.2T Trainer is designed to look like, don like and have breathing resistance similar to the M-20.2 EEBD.

Opening and donning an M-20.2 EEBD is a motor skill. The most effective method of teaching a motor skill is to have the student repetitively perform the motor skill.

It is essential that the students have “hands on” experience with the M-20.2T Trainer. The more often students have the M-20.2T Trainer in their hands and the more often the M-20.2T Trainer is donned in practice, the better their recall will be. Periodic training is highly recommended to achieve proficiency.

A. The following describes the theory of operation of the M-20.2T Trainer:

1. The M-20.2T Trainer is worn on the belt to demonstrate the proper orientation on the belt or is placed in the blue Secondary Container to simulate the stored position.
2. The Latch assembly is identical to the M-20.2 EEBD, so that the opening of the M-20.2T Trainer is practiced “hands on”.
3. As the unit is pulled from the base by the Neck Strap, the Activation Cable Snap disconnects from the Oxygen Regulator, simulating the oxygen activation of the M-20.2 EEBD.
4. During inhalation, air is supplied to the student from the atmosphere through holes in the Mouthpiece.
5. During exhalation, air is exhaled into the Mouthpiece, passing through the holes in the Mouthpiece to the atmosphere. During inhalation and exhalation, the breathing resistance through the Mouthpiece holes simulates the breathing resistance of the M-20.2 EEBD.

B. The following are steps to clean and re-pack the M-20.2T Trainer:

1. Remove the Mouthpiece from the Scrubber by pressing the release button with a standard pencil erasure or similar object and pulling upwards on the Mouthpiece removing it from the Scrubber.
2. Sanitize the Mouthpiece using one of the following methods:
 - (a) Immerse Mouthpiece for 2 minutes in warm water 110°F (43°C) solution of hypochlorite solution (approximately one milliliter of liquid laundry bleach to 1 liter of water)
 - (b) Immerse mouthpiece for 2 minutes in a warm water 110°F (43°C) solution of Wescodyne (approximately 2 tablespoons of Wescodyne per 1 ½ gallons of water).
3. Rinse under clean running warm water at a temperature of about 110°F, DO NOT exceed 122°F (50°C)
4. Allow Mouthpiece to air dry. DO NOT dry Mouthpiece by placing near heat or in direct sunlight.
5. Wipe remainder of the M-20.2T Trainer with a sponge dampened in cleaning solution.
6. Air dry in a clean, uncontaminated area in such a way as to prevent distortion of mouthpiece.
7. Snap the Mouthpiece onto the Scrubber Spring Clips.
8. Fold the Breathing Bag into a rectangle no larger than the bottom of the Scrubber.
9. Snap the Activation Cable onto the Oxygen Regulator.
10. Carefully set the M-20.2T Trainer into the Base while holding the Breathing Bag (folded) against the bottom of the Scrubber. It may be helpful to use a packing strap to help hold the Breathing Bag in place. Remove the strap after the M-20.2T Trainer is in the Base.
11. Hold the Mouthpiece and Noseclip and fold the Neck Strap on top of the Mouthpiece and Cylinder. It may be helpful to use a packing strap to hold in place.
12. Place the Cover on the Base, make sure to remove the packing strap if it was used.
13. Hook the S-Hook on the Belt Loop side of the Base Assembly with the two hooks curling away from the case.
14. Hook the Latch Assembly on the front side of the Base, making sure it is correctly secure in the slot as shown in Fig. A.

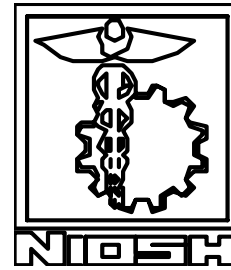
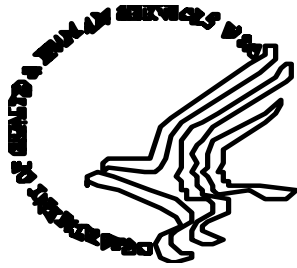


Fig. A. Correct band position.



Fig. B. Incorrect band position

15. Bring the Latch Assembly over the Cover and engage the two yellow forks on the lever in the curled tabs of the S-Hook and push down on the yellow lever.



OCENCO, INCORPORATED
 PLEASANT PRAIRIE, WI USA
 (262) 947-9000
 MODEL M-20.2

**CLOSED-CIRCUIT COMPRESSED OXYGEN ESCAPE
 SELF-CONTAINED BREATHING APPARATUS**

THIS RESPIRATOR IS APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

TC #	Protection ¹	Optional overcase base	Optional overcase cover	Optional Bag shield	Optional Face shield	Alternate extended base	Alternate extended cover	Cautions ² and limitations
13F-386	10 min/ 3850psi/ SC	X	X	X	X	X	X	JMNOS

1. PROTECTION SC-Self-contained

2. CAUTIONS AND LIMITATIONS

- 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 MSHA, OSHA, and other applicable regulations.
- N - Never substitute, modify, add, or omit parts.
- O - Refer to the users instructions and/or maintenance manuals for information on the use and maintenance of this respirator.
- S - Special or critical users instructions and/or specific use limitations apply. Refer to instruction manual before donning.

SPECIAL USER INSTRUCTIONS

1. - Failure to properly use and maintain this product could result in injury or death.
2. - All approved respirators shall be selected, fitted, used and maintained in accordance with MSHA, OSHA, and other applicable regulations.
3. - Never substitute, modify, add, or omit parts.
4. - Refer to the users instructions and/or maintenance manuals for information on the use and maintenance of this respirator.
5. - Special or critical users instructions and/or specific use limitations apply. Refer to instruction manual before donning.
6. -Approved for use at temperatures above 10° F (-12.2° C)