Warnings

- MAXAIR® Systems are not intended for use in atmospheres immediately dangerous to life or health (IDLH), including explosive atmospheres where intrinsic safety is required for safe operation of electronic equipment.
- MAXAIR sensor LEDs indicate when it is no longer able to maintain adequate protection for the user. When so indicated, failure to exit immediately to a safe area may be hazardous to the user’s health.
- The use of MAXAIR Systems in an alarm condition is only for immediate exit to a safe environment.
- Do not use MAXAIR Systems near flame or other heat sources.
- MAXAIR Systems filters are not for use against oily particulates (paint mist, oil mist, detergents).
- Damaged and worn Filters must be replaced immediately.
- Never attempt to repair a damaged Hood, Cuff, Shroud, Filter Cartridge, or Filter Cover/Cap.
- Never use compressed air to clean MAXAIR Systems or Filters.
- All MAXAIR Systems Filter/Helmet configurations must be configured as described herein to maintain compatibility with NIOSH approval.
Cautions

• The purchaser/user is responsible for determining the appropriateness of their MAXAIR Systems for each/any of their particular applications and environments.

• All filters used with MAXAIR Systems have a finite useful life which is affected by:
  – The amount of contaminants in the air.
  – The type of contaminant in the air.

• Used properly, MAXAIR Systems protect against airborne particulates at the level specified per the NIOSH label on the Filter/Filter Cartridge chosen for use.
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Bio-Medical Devices (BMDI)

- Leader in the development and manufacturing of personal respiratory safety products for healthcare, pharmaceutical manufacturing, bio-research labs, and industrial markets.
- Corporate headquarters in Irvine, CA
- Facilities in Irvine and Chino, CA and Tijuana, Mexico
- All MAXAIR Systems products are audited and certified to meet the rigorous standards of the
  - Food and Drug Administration (FDA)
  - Good Manufacturing Practice Regulations (GMP)
  - National Institute for Occupational Safety and Health (NIOSH)
- All MAXAIR Systems manufacturing is ISO Certified, 13485 ver 2003
Bio-Medical Devices (BMDI)

• MAXAIR respiratory devices provide protection against aerosolized and airborne droplet particulates under the OSHA 29 CFR 1910.134 Standards for Personal Protective Equipment, and are approved under NIOSH 42 CFR Part 84, Certification requirements for respiratory protective devices.

• MAXAIR Systems are Computerized All-in-the-helmet Air Purifying Respirators. They represent advanced, highly differentiated designs evolved from the principles of conventional PAPRs (Powered Air Purifying Respirators) with many unique advantages in:
  – Comfort and convenience
  – Affordability
  – Performance
  – Reliability
Droplet and Airborne Transmission Risks

- Diseases that can be transferred through the respiratory system include:
  - Anthrax
  - Bacterial Meningitis
  - Common cold
  - Influenza
  - Measles
  - MERS
  - Mumps
  - Polio
  - Rubella
  - SARS
  - Strep throat
  - Tuberculosis
  - Varicella
  - Whooping cough
Medical Procedures that could facilitate airborne transmission of disease include:

- BiPAP
- Bronchoscopy
- CPAP
- Intubation
- Nebulizer treatment
- Sputum induction
- Suctioning
Filtration

- Filter collection mechanisms curve - basic characteristic of a particulate filter

- MAXAIR Systems filters
  - Combined mechanical and electrostatic
  - HE or higher filtration levels
  - MPPS (Most Penetrating Particle Size) 0.04-0.06μm
  - Larger and smaller particles are filtered at higher efficiencies
Filtration - Particle Size

<table>
<thead>
<tr>
<th>PARTICLE</th>
<th>SIZE (MICRONS)</th>
<th>CLINICAL CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust</td>
<td>5-7</td>
<td></td>
</tr>
<tr>
<td>Bacteria</td>
<td>0.25 – 1.5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Size</th>
<th>Clinical Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>1.0</td>
<td>Pneumonia, leukemia, sepsis, renal failure, diabetes</td>
</tr>
<tr>
<td>Pseudomonas diminuta</td>
<td>0.62</td>
<td>May cause septicemia</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>0.5</td>
<td>Meningitis, septicemia, endocarditis, osteomyelitis, pneumonia</td>
</tr>
<tr>
<td>Serratia marcescens</td>
<td>0.45</td>
<td>Extraintestinal infections, many nosocomial outbreaks</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td>0.3 X 1.0 (smallest)</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Anthrax</td>
<td>1.0 x 4.0</td>
<td></td>
</tr>
</tbody>
</table>

### Virus

<table>
<thead>
<tr>
<th>Virus</th>
<th>Size</th>
<th>Clinical Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthomyxovirus</td>
<td>0.12</td>
<td>Influenza</td>
</tr>
<tr>
<td>Cytomegalovirus</td>
<td>0.1</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>HIV</td>
<td>0.08</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>0.07</td>
<td>Respiratory infections</td>
</tr>
<tr>
<td>Hepatitis Virus</td>
<td>0.02</td>
<td>Hepatitis</td>
</tr>
</tbody>
</table>

Filtration - Particle Size

<table>
<thead>
<tr>
<th>Potential Infectious Viruses (Particle Sizes μ microns)</th>
<th>Potential Infectious Bacteria (Particle Sizes μ microns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteriophage MS-2 (0.02μ)</td>
<td>HIV (0.08μ)</td>
</tr>
<tr>
<td>Hepatitis Virus (0.02μ)</td>
<td>Cytomegalovirus (0.1μ)</td>
</tr>
<tr>
<td>Adenovirus (0.07μ)</td>
<td>Orthomyxoovirus (0.1μ)</td>
</tr>
<tr>
<td>HIV (0.08μ)</td>
<td>Cytomegalovirus (0.1μ)</td>
</tr>
<tr>
<td>Cytomegalovirus (0.1μ)</td>
<td>Orthomyxoovirus (0.1μ)</td>
</tr>
<tr>
<td>Staphylococcus aureus (1.0μ)</td>
<td>Bacillus Subtilis (1.0μ x 0.7μ)</td>
</tr>
</tbody>
</table>

Respirator Classification

• Generally by source and mechanism of airflow in/out of the device, filter characteristics, coverage area on the wearer, and fit to the wearer.
Respirator Classification

- Air Purify
  - Masks
    - Dust (quarter) Mask
    - Half Mask
    - Full Mask
  - Powered Air Purifying Respirators (PAPR)
    - Hosed (traditional)
    - MAXAIR Hose Free CAPR

- Air (Atmosphere) Supplying
  - Supply Line (airline)
  - Self Contained Breathing Apparatus (SCBA)
General User Precautions

- MAXAIR Systems are NOT intended for use in atmospheres IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH).

- MAXAIR Systems are not intended for use in explosive atmospheres where intrinsic safety is required for safe operation of electronic equipment.

- MAXAIR Systems are NOT for use in atmospheres containing less than 19.5% or greater than 25% oxygen (MAXAIR CAPR does NOT produce oxygen).

- Do not use if airflow is less than 6 cfm (cubic feet of air per minute).

Refer to the User’s Instructions, P/N 03521015, for a complete list of warnings.
General User Precautions

• **NOT** for use against oily particulate (paint mist, oil mist, detergents)

• Replace damaged or worn filters immediately

• **NEVER** repair a damaged filter cartridge or face/head cover

• **NEVER** use compressed air to clean filter cartridges

• Do not use near flame or other heat source

Refer to the User's Instructions, P/N 03521015, for a complete list of warnings
**CAPR® Introduction**

- **MAXAIR® CAPR® System**
  - CAPR – Controlled Air Purifying Respirator
  - Advanced design respirator provides respiratory protection against aerosolized and airborne droplet (particulate) contaminants
  - Highly differentiated from conventional PAPRs
    - Comfortable convenience
    - Affordability
    - Performance
    - Reliability
  - NIOSH 42 CFR Part 84, Certification requirements for respiratory protective devices (1995)
CAPR Introduction

• **CAPR System Key Features and Advantages**
  – Compact, lightweight, fewer parts
  – Safety Status LEDs – Always Visible in the peripheral vision
  – MicroComputer Controlled User Adjustable Air Flow
    • Match air flow to work activity level
    • Laminar Flow – Low noise with a comfortable cooling effect
    • Whisper quiet for stethoscope use
  – No Hose – no awkward air tube; eliminates chance of catching/snagging
  – No bulky Blower Unit – optimum ease and freedom of movement
  – Convenient Configuration Change
    • Cuff
    • Shroud
    • Hood
CAPR Introduction

- **CAPR System Key Features and Advantages**
  - Simplified De-Contamination
  - Cost Effective Disposables
  - Non claustrophobic
  - Anti-fog lens
  - No heat build-up
  - No moisture build-up
  - No facial pressure points
  - Reduced CO₂ buildup
• **CAPR System References**

For more details regarding your system refer to the CAPR System User’s Instructions, P/N 03521015, and the package insert Instructions For Use (IFU) included with each system component.
How MAXAIR Works

- Blower pulls outside air in through the filter and gently distributes around the face
- Positive pressure is maintained within the helmet and face/head cover
  - Prevents inhalation of potentially contaminated air
  - No need for fit testing as with negative pressure mask respirators
  - Makes breathing very easy
  - Prevents heat and moisture build-up
  - Prevents lens fogging and CO₂ build-up
  - Eliminates facial pressure points
How MAXAIR Works

• The micro-computer controlled blower allows the user to adjust the desired air flow level from Low, to Medium, to High, to meet their particular activity level
How MAXAIR Works

- **Safety Status LED Indicators**
  - The MicroComputer controller uniquely monitors and indicates system air flow and battery charge status.
  - Status is continuously, during real-time use, and unobtrusively displayed visually to users in their upper peripheral vision.
  - Users are always alerted ahead of time of upcoming unsafe conditions regarding air flow and battery charge remaining to have time to move to safety to inspect the filter for change out, and the battery for re-charging or change out.

### Status Indicator LED MATRIX

All conditions (X indicates LED is lit)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery charge ok 75% to 100%</td>
<td></td>
</tr>
<tr>
<td>Airlow ok</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge ok 50% to 75%</td>
<td></td>
</tr>
<tr>
<td>Airlow ok</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge ok 25% to 50%</td>
<td></td>
</tr>
<tr>
<td>Airlow ok</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge low 0 to 25%</td>
<td></td>
</tr>
<tr>
<td>Airlow ok</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge low</td>
<td></td>
</tr>
<tr>
<td>Airlow low</td>
<td>X</td>
</tr>
<tr>
<td>Airflow low</td>
<td></td>
</tr>
<tr>
<td>Battery charge ok 75% to 100%</td>
<td></td>
</tr>
<tr>
<td>Airlow low</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge low</td>
<td></td>
</tr>
<tr>
<td>Airflow low</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge ok 50% to 75%</td>
<td></td>
</tr>
<tr>
<td>Airlow low</td>
<td>X</td>
</tr>
<tr>
<td>Battery charge ok 25% to 50%</td>
<td></td>
</tr>
<tr>
<td>Airlow low</td>
<td>X</td>
</tr>
</tbody>
</table>

**Legend**

- Yellow = Air Flow Filter Status
- Greens = Battery Charge Level
- Red = Low Run Time Alert
How MAXAIR Works

• Batteries – All MAXAIR configurations are powered by Li-Ion Batteries
  – 2500-36TSC is an 8-10 hour per charge battery that suits most applications and is particularly convenient. It is small and lightweight.
  – Optional 2500-30TSC is a 16-20 hour per charge battery for all MAXAIR applications. It may be more suitable for excessively long periods of use, environments that cause rapid filter loading, etc.
System Configuration Basics

Systems – 4 Components (e.g. DLC-CAPR-36)

1. Helmet w/Cage, Liner, and Power Cord
   Available separately as replacements:
   A. Cage
   B. Liner
   C. Power Cord
2. Battery
3. Belt
4. Charger

For Complete Cuff and Shroud Configurations:
- Remove cage
- Add Filter Cartridge
- Add Filter Cover Cap
- Add choice of Cuff or Shroud

For Complete Hood Configurations:
- Add choice of Hood
Assembly¹ - Important Focus Points

The purpose of this check list is to ensure the following components are properly assembled:

- Filter Cartridge securely snapped on the helmet
  - All three snap tabs, right and left sides, and rear, are secured to the Helmet
  - There are no cuts, tears, or soiled areas of the Filter Media
  Note: Filter will “tear” if assembled improperly

- Filter Cover Cap (FCC) securely snapped over the helmet
  - Front FCC snap is securely positioned over the Helmet front DLC Mounting Post
  - FCC rear T-Tab is securely positioned over its rear Helmet Snap

- Helmet Headband Adjustments are positioned for secure and comfortable donning
  - The front headband bottom is within ½ inch of the eyebrows for clear visualization of the Safety LEDs
  - The Height Adjustment Tabs are in the same respective positions on both sides
  - Circumference ratchet knob set to secure Helmet on the head for all activities required

- DLC is secure at its three helmet attachment points and around the face
  - Tension is continuous between DLC and face from side to side and under chin
  - DLC Flappers are within ¼ inch of temples on each side

¹ Cuff configuration described; Refer to User’s Instructions, P/N 03521015, for assembly of other configurations
Assembly - Helmet Liner to Helmet

- **DLC System kit includes Helmet Liner preassembled on the Helmet**
- **If Helmet Liner requires reassembling, follow instructions below**

**Place Liner inside Helmet**

- Secure both top snaps
- Secure both bottom snaps

*Ensure Liner bottom lip is fully up and against helmet, completely around entire helmet as in B, not as in A.*

Back to Index
Assembly - HE Filter Cartridge (FC) to Helmet

- Start by placing FC over Helmet starting at the Helmet rear.

- Secure Cartridge rear by pressing rear tab down on snap.

- Grasp Helmet bottom with fingers, press thumbs down on Cartridge retainer ring until side tab holes are over snaps.

- Secure both left and right side tabs by pressing tab down on snap.

NOTE: Your Helmet may have shipped with a Cage snapped to its top for Blower protection during shipping. Before assembly of a Cuff or Shroud configuration, remove the Cage by unsnapping the rear snap tab from the Helmet, then unsnap each of the side tabs from the Helmet, then lift the Cage up and off the Helmet. Store the Cage for potential future use with a Hood configuration.
Assembly - Filter Cover Cap (FCC) to Helmet

- Secure FCC front Alignment hole over the Helmet front Alignment Post
- Pull FCC down over back of helmet and secure rear T-Tab onto lower rear Helmet snap (a)
- If Helmet has a Pull Tab, Secure Pull Tab to the top rear snap (b)

Properly Assembled

(b) Optional Pull Tab and snap

(a) T-Tab
Assembly - DLC (Disposable Lens-Cuff)

Disposeable Lens-Cuff Components

VERY IMPORTANT - Ensure Proper Fit of the DLC
Unless you have a very small face, begin with the 2365-02ML DLC
(see page 37)

- Helmet Attachment Holes
- Lens (faces outward, in front of cuff)
- Cuff (faces to inside of Helmet, behind the lens)
- Pull tab to remove outer lens protector film
- Flappers – must be within ¼ inch of temples

Back to Index
Assembly - DLC (Disposable Lens-Cuff)

**Note:** Disassemble by reversing assembly process

**NOTE:** Begin with the 2365-02 ML, or the 2365-02SM for very small faces. (see page 37)

1. Secure one side DLC Attachment Hole over its Helmet Side Attachment Post

2. Place the DLC center Alignment Hole over the Helmet center Alignment Post

3. Secure other side DLC Attachment Hole over other Side Attachment Post

*DLC will “click” when properly secured on each Side Attachment Post*
Assembly – Reminder, Important Focus Points

The purpose of this check list is to ensure the following components are properly assembled:

- HE Filter Cartridge securely snapped on the helmet
  - All three snap tabs, right and left sides, and rear, are secured to the Helmet
  - There are no cuts, tears, or soiled areas of the Filter Media
  
  *Note: HE filter will “tear” if assembled improperly*

- Filter Cover Cap (FCC) securely snapped over the helmet
  - Front FCC snap is securely positioned over the Helmet front DLC Mounting Post
  - FCC rear T-tab Tab is securely positioned over its rear Helmet Snap

- Helmet Adjustment Tabs are positioned for secure and comfortable donning
  - The front headband bottom is within ½ inch of the eyebrows for clear visualization of the Safety LEDs
  - The Height Adjustment Tabs are in the same respective positions on both sides
  - Helmet is secure on the head for all activities required

- DLC is secure at its three helmet attachment points and around the face
  - Tension is continuous between DLC and face from side to side and under chin
  - DLC Flappers are within ¼ inch of temples on each side

Back to Index
Donning - Battery & Belt

(either 2000-36TSC or 2000-30TSC)

A. Clip the Li-Ion battery to the battery belt

B. Adjust belt length for proper fit & secure around waist

*Note:* Battery over right hip is recommended.
Ensure the Helmet Power Cord is securely connected to a fully charged battery to initiate airflow before donning (See CAPR User’s Instructions, P/N 03521015, for securing details).

Connect the Helmet Power Cord to the Battery by pushing the cord connector into the Battery receptacle until you hear the audible “click” of the Secure Lock locking around the cord connector.

Be sure the lens protector is removed from the DLC - pull the peel tab up and from right to left.
1. Turn Ratchet Knob counterclockwise to loosen Headband

2. Hold Helmet by Ratchet Knob with one hand, top of DLC Cuff with the other, place chin in cup between cuff-lens, pull Helmet over and down on head

3. Tighten ratchet band by turning ratchet knob “clockwise” for most secure and comfortable fit

*Note: Doff by reversing the Donning process*
Donning - The CAPR System

VERY IMPORTANT - Ensure Proper Fit of the DLC

Proper fit is when both A and B are achieved -

A) Tension on the cuff must be felt continuously while sliding the index or first finger between the cuff and the face all along the chin, from the right side of the face to the left.

B) The Flappers on both left and right sides are within ¼ inch of both right and left temples.

IMPORTANT: If both conditions are not met, switch to the other size DLC and return to page 32.

Back to Index
Donning - The CAPR System

VERY IMPORTANT - Ensure Proper Fit of the DLC

Helmet Front Headband Proper Positioning

A. Headband should rest ½ inch above eyebrow

B. LED lights in upper peripheral vision should be clearly visible
Helmet Headband Position Adjustment

VERY IMPORTANT - Ensure Positioning Secures Helmet On Head for All Required Activities

After donning the CAPR System with DLC in place, if the helmet is not secure on head for all activities, doff, adjust Headband Position and re-don (page 36)

- Check Headband Adjustment positions for secure donning for all required activities
- Reposition appropriately with both sides at the same level
Changing the DLC with Helmet On

1. Grasp the DLC near the side Attachment Holes pull straight out away from the Helmet and off the side Helmet Attachment Posts

2. Continue to pull the DLC out and forward away from the front of the Helmet to remove it from the front Helmet Alignment Post and completely off the Helmet

3. Dispose of the DLC by approved institutional protocol for contaminated objects

4. If the DLC is to be reused, decontaminate it by wiping down all inner and outer surfaces with an alcohol, bleach, or quaternary ammonium wipe
Changing the DLC with Helmet On

1. For a new DLC, grasp the Peel Tab and remove Lens Protector by pulling right to left
2. Secure one side DLC Attachment Hole on its respective Helmet Attachment Post (the DLC will “click” when properly secure)
3. Pull the DLC over the front of the Helmet and place the center DLC Alignment Hole over the center Helmet Alignment Post
4. Secure the other side DLC Attachment Hole on its respective Helmet Attachment Post (the DLC will “click” when properly secure)
Disassembly - Filter Cover Cap (FCC)

1. Press down on the FCC
2. Pull up on the T-Tab to unlatch it from the rear lower snap
3. Simultaneously lift the FCC up while pulling the Helmet down with the bottom of your hand against the Headband

• If Helmet has an optional Pull Tab, unsnap it from the FCC
• Rest the front of the Helmet on a countertop, or other surface
• Hold the Helmet in one hand with your hand between the Helmet and the Headband

Back to Index
Disassembly - HE Filter Cartridge (FC)

- Gently lift one side snap tab off of Helmet snap
- Lift other side snap tab off of Helmet snap
- Lift rear snap tab off of Helmet snap and continue lifting Filter Cartridge up and off Helmet.
Disassembly - Helmet Liner

• **Grasp the Liner just above the front Comfort Strip with the thumbs while holding the front of the Helmet with the fingers. Unsnap the two Liner front snaps by pulling the Comfort Strip toward you while pushing the Helmet away.**

• **Move one hand to hold the Helmet on one lower side. Continue pulling the Liner toward you with the other hand until the Liner is off the rear snaps and completely off the Helmet and the Helmet Power Cord.**
LED Indicator lights in upper peripheral vision, alert user, in real time, for equipment maintenance (proper air flow and battery run time remaining)

They eliminate the need for additional airflow and battery test equipment

- **Yellow LED** – low airflow
  - Check for proper function of the helmet
  - Replace Filter Cartridge if damaged or dirty

- **Red LED** – low battery
  - When lit, user has approximately 15 minutes to change out battery
  - Check for damages on battery (i.e., Cracks)
  - Replace with a fully charged battery if necessary

- **Green LEDs** – battery charge remaining
  - Check for proper connection between power cord, battery, and helmet
  - Replace with a fully charged battery if necessary

  3 Green lit ~ 75%-100% charge remaining
  2 Green lit ~ 50%- 75% charge remaining
  1 Green lit ~ 25%- 50% charge remaining
On start-up, all LEDs should come on briefly (LED test) before proceeding to normal operation.

During normal operation, the LEDs continuously indicate the status of the Airflow and Battery level.

Airflow is good if the Yellow LED is off. A continuously lit or flickering Yellow LED indicates low or marginal airflow. If the Yellow LED is lit, check the Filter for excess particulate/dirt build-up and damage, and replace if necessary.

The Battery level is indicated by the three Green and one Red LEDs:

• When all three Green LEDs are lit, the Battery has approximately 75% to 100% of its charge.

• When two Green LEDs are lit, the Battery has approximately 50% to 75% of its charge.

• When only one Green LED is lit, the Battery has approximately 25% to 50% of its charge. When this occurs the user should be preparing to exit to a safe area to obtain a fully charged Battery.

• When all three Green LEDs are off and the Red LED is lit, the Battery level is low, approximately 0% to 25% charge left.
Helmet Airflow Switch

**Airflow Switch:**
The Helmet is equipped with a switch to adjust the operating airflow. When the Helmet is first turned on it will start at a low level then the airflow will increase to a preset point according to the switch position.

<table>
<thead>
<tr>
<th></th>
<th>Lo</th>
<th>Med</th>
<th>Hi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(~190 lpm, ~6.7 cfm)</td>
<td>(~215 lpm, ~7.6 cfm)</td>
<td>(~240 lpm, ~8.5 cfm)</td>
</tr>
</tbody>
</table>

*NOTE: The flow levels, in liters per minute, cubic feet per minute, are only approximate.*

Recommended position for typical activities is Low
Maintenance - Filter Cartridge Replacement

– If blood and/or bodily fluids contaminate the filter, dispose of the Filter Cartridge according to the hospital’s contaminated waste disposal protocol

– Dispose of the Filter Cartridge if the filter becomes damaged or breathing resistance increases

– The Filter Cartridge may be functional for weeks or months due to the added protection of the filter cover

– Hospital personnel should follow their standard operating procedures for infection control in conjunction with the use of personal protective equipment
Maintenance - General System Cleaning

**IMPORTANT - Do not immerse Helmet w/fan module in water**

- Recommended disposal of DLC
  - Preferable to dispose of potentially contaminated DLC after care of an infectious patient
  - Signs for tear, scratched lens, etc.
  - Contact with blood for bodily fluid

- Recommended HE Filter Cartridge change out
  - When the **Yellow** LED indicator is constantly on
  - Signs for tear or other potential functional damage
  - Contact with blood for bodily fluid

- Disinfect the following items using Quaternary Ammonium, Bleach, or Alcohol wipes:
  - Filter Cover Cap & Helmet
    - Replace helmet if motor is not working
  - DLC
    - Wipe between uses

  **Note:**
  *If residue is present, additionally wipe with moist towelette or change to a new DLC*
  - Helmet liner w/ratchet suspension and rear headband cushion
  - Battery
**Maintenance - General System Cleaning**

**IMPORTANT - Do not immerse helmet w/fan module into water**

- Optional change out of Helmet Liner for hygiene purposes
  - Personnel hygiene preference
  - Disassemble by holding Helmet upside down firmly with one hand
  - With the other hand, use thumb to hook under headband and pull the Liner off and away from Helmet

- Clean liner by wiping with an alcohol, bleach, or quaternary ammonium wipe
Maintenance – Comfort Strip Replacement

IMPORTANT - Do not immerse helmet w/fan module into water

Comfort strip replacement

- Pull the old strip from the front headband and discard
- Attach new strip to front headband
  • Center the new strip onto the Velcro
  • Only one side of the Comfort Strip will attach to tape on the Helmet

NOTE: The rear headband cushion and the four head cushions on the top underside of the Helmet Liner are closed-cell foam and may be cleaned by wiping with an alcohol, bleach, or quaternary ammonium wipe
When finished wearing the CAPR System, disconnect the power cord from the battery by pressing down on the black Secure Lock Button to release the cord connector and pull the cord connector out of the battery connector.

Connect the battery to the charger to re-charge. Insert the Charger Connector all the way into the Battery Connector. Push in firmly until you feel the Charger Connector “hit bottom” of the Battery Connector.

The Li-Ion battery has no memory and is not negatively affected by repeated connection to the charger.

**WARNING:**
A Battery must not be left on the Charger after the Charger LED turns Green. For safety, always remove the Battery from the Charger when the Charger LED turns Green. For infrequent Battery use, refer to your CAPR System User's Instructions for details.
Battery - Charging

CHARGING INSTRUCTIONS
1. Connect the charger to an appropriate 110v wall outlet – Green light will come on.
2. Connect the battery to the charger – Red light will come on if battery needs charging. If Green light stays on, battery is sufficiently charged for use.
3. When charging is complete Green light will come on and battery is ready for re-use with CAPR.

LED’S INDICATE CHARGE STATUS

Fast charge
Constant current mode. Maximum charge current.

Final charge
Constant voltage mode. Charge current less than maximum. Battery is normally 80-95% charged. Charger in this mode until charge current decreases to charge termination level.

Charge completed
Charging is stopped. Zero charge current. LED changes to green.
Battery - Storage

(Batteries not used on a regular basis)

- If the battery is not used on a regular basis…it is recommended to store it at 50% charge
- Initial “out-of-the-box” Lithium-Ion battery condition is at a 50% charge
- This ensures 4-5 hours of emergency use prior to being fully charged

Long-Term Storage:

- Store batteries @ 50% charge at reduced temperature (See CAPR User’s Instructions for details)
- Recovered capacity after charging is typically 99% after 12 month storage under optimum storage conditions

Refer to the CAPR System User’s Instructions for details
Appendix A.
Training Competency Checklist

- **APPLICATIONS**
  - Know that CAPR Systems are only to be used for protection from Bacterial and Viral contamination exposure such as TB, SARS, Anthrax, Smallpox and the Avian Flu.
  - Know that CAPR Systems are NOT intended for protection from chemical and gas exposures.

- **ASSEMBLY**
  - Can identify Yellow, Green, and Red LED warning lights and their meaning.
  - Understand proper assembly of filter media onto helmet.
  - Understand proper attachment of filter cover cap to helmet.
  - Know how to properly assemble and disassemble the DLC face seal to the system.

- **DONNING**
  - Understand importance of proper positioning and adjustment of headbands, headband height, and ratchet suspension knob for comfort and secure positioning.
  - Knowledge of proper positioning of DLC Flappers and Cuff-to-face tension.
  - Know how to properly connect and disconnect power cord from helmet to battery.
Appendix A.
Training Competency Checklist

• FILTER USAGE
  – Know to replace filter media if blood and/or bodily fluids contaminate filter media.
  – Know proper procedures for disposal according to the hospital’s contaminated waste disposal protocol.
  – Know how to identify when filter media needs replacement due to wear and tear.

• BATTERY OPERATION
  – Know to plug charger into wall outlet BEFORE plugging into battery.
  – Know how to re-charge Lithium-Ion battery on the charger.
  – Understand meaning of Red and Green LED conditions on charger.
  – Know NOT to leave battery on charger longer than 4 weeks.

• CLEANING & MAINTENANCE
  – Know to use Quaternary Ammonium, Bleach or Alcohol spray/wipes to clean outer and inner surfaces of helmet, filter cover cap and battery.
  – Know not to immerse helmet w/fan module into water.
Appendix A.
Training Competency Checklist

• GENERAL USER PRECAUTIONS
  – Understand that MAXAIR Systems are NOT intended for use in atmospheres IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH).
  – Understand that MAXAIR Systems are NOT for use in atmospheres containing less than 19% oxygen – MAXAIR DOES NOT produce oxygen.
  – Know not to use system if airflow is less than 6 CFM.
  – Know that MAXAIR Systems are NOT for use against oily particulates (paint, mist, oil mist or detergents).
Appendix B.
Annual Review Test Questions

1. One of the primary benefits of the MAXAIR CAPR Systems is:
   a. Provides even airflow across the face
   b. Does not need a battery belt
   c. Provides greater freedom of movement

2. MAXAIR CAPRs can be used for protection from:
   a. Chemical and Biological
   b. Chemical only
   c. CBRN – Chemical, Biological, Radiological and Nuclear
   d. Bacterial and viral airborne particulate contaminants

3. Stethoscopes are able to be used with the MAXAIR CAPR cuffs because:
   a. The cuff material is very thin and you can clearly hear through this material
   b. The cuff fits close to the face and in front of the ears
   c. The airflow exits at the bottom of the cuff and is very quiet

4. MAXAIR CAPR helmets have 5 LED indicators to indicate:
   a. 1 hour of battery life left and/or a damaged filter
   b. Low airflow and/or amount of battery charge remaining
   c. Battery is not functional and/or the filter needs immediate changing

5. The helmet must be worn with the front headband approximately ½” above the eyebrows because:
   a. This allows for proper airflow, a wide field of vision, and easy visibility of the LED indicators in your peripheral vision should they illuminate
   b. It allows for maximum air to be exhausted below the cuff or shroud
   c. It fits better and allows less contaminant to enter the helmet
Appendix B.

Annual Review Test Questions

6. Adjustment of the MAXAIR CAPR helmet is accomplished by:
   a. Adjusting the center band at the top of the helmet
   b. There is no adjustment for the helmet as one size fits all
   c. Adjusting the ratchet knob and height position of the Helmet Headband

7. The airflow setting in the MAXAIR CAPR helmets from the factory is set at 6 CFM (cubic feet/minute)

8. The airflow adjustment switch allows you to change the airflow setting approximately from:
   a. 7 – 10 CFM
   b. 6 – 9 CFM
   c. 5 – 8 CFM

9. The reason there is no fit testing required with MAXAIR CAPRs is:
   a. The motor runs more efficiently than any other PAPR on the market
   b. There is greater area for airflow
   c. They are positive pressure devices

10. The HE filter used with MAXAIR CAPRs meets what NIOSH efficiency rating:
    a. 99.97% efficiency
    b. The same as an N95
    c. 95% efficiency
Appendix B.
Annual Review Test Questions

11. Assembly of the HE filter media onto the helmet is from:
   a. Back to front
   b. Front to back
   c. It does not make any difference how the filter is assembled onto the helmet

12. The Lithium-Ion battery that is recommended for MAXAIR CAPRs for Emergency Preparedness runs for approximately how long per full charge:
   a. 16-20+ hours
   b. 8 hours
   c. 4 hours and must be changed out with a new battery after lunch

13. The Lithium-Ion battery that is used with MAXAIR CAPRs for routine Infection Prevention applications runs for approximately how long per full charge:
   a. 12 hours
   b. 10 hours
   C. 8 –10+ hours

14. The Lithium-Ion battery has no MEMORY which allows you to place the battery on the battery charger after each use, regardless of how long it was in actual use.
Appendix B.  
Annual Review Test Questions

15. The Lithium-Ion battery should not be left on the charger without use for longer than:
   a. ONLY until the Charger LED turns Green – Then Disconnect the Battery
   b. 1 week
   c. Indefinitely

16. MAXAIR CAPR Helmets and Filter Cover Caps can be cleaned with the following:
   a. Quaternary disinfectant wipes
   b. Soap and water
   c. Bleach diluted with water
   d. Quaternary Ammonium, Bleach or Alcohol based disinfectant wipes

Back to Index
Appendix C.

Example Standard Operating Procedures

EXAMPLE ONLY – THIS IS NOT INTENDED AS A RECOMMENDED SET OF STANDARD OPERATING PROCEDURES FOR YOUR FACILITY.

EACH FACILITY MUST DEVELOP THEIR OWN SPECIFIC SOP’S FOR THEIR USE OF PPE IN THEIR FACILITY.
Appendix C.
Example Standard Operating Procedures

Standard Operating Procedures – Infection Prevention with MAXAIR CAPR Systems

PURPOSE:

To protect staff from airborne pathogens during routine care for patients where protection from airborne contaminants is warranted.

POLICY:

MAXAIR CAPR Systems (Controlled Air Purifying Respirators) are to be used by all health professionals entering negative airflow, Airborne Infection Isolation Rooms (AIIR) during hospitalization of patients requiring Airborne Precautions (See Exposure Control Plan), and wherever personnel may be near suspect and confirmed infectious patients whose infections may be transmitted via airborne means.
1. All staff who will have need of MAXAIR CAPRs must be familiar with them and receive initial training describing purpose, adequate use, and care of MAXAIR CAPRs. Additional training will be provided to direct caregivers as needed before a suspect or confirmed infectious patient arrives on the unit or after need for airborne precaution is determined.

2. Proper assembly, donning/doffing, de-con and maintenance procedures:

Refer to MAXAR CAPR System User’s Instructions, P/N 03521015 shipped with each CAPR System Helmet.

NOTE:
The hospital protocol may include that the sterile processing department picks up the MAXAIR CAPR Systems from the units and disinfects them according to protocol.
3. The Lithium-Ion batteries provide up to 10 hours (2000-36TSC), or up to 20 hours (2000-30TSC), of continued use per charge.

4. Use of MAXAIR CAPRs can be discontinued upon Physician orders and/or recommendation from the Infection Control Practitioner.

5. Equipment Storage & Maintenance

   A. MAXAIR CAPRs will be stored on the Med/Surg unit and in the Emergency Room, or as otherwise directed by hospital protocol.

   B. MAXAIR CAPRs will be stored assembled and ready for immediate use.

NOTE: Hospital protocols may dictate the Sterile Processing Department to be responsible for item 5. above.
Appendix C.
Example Standard Operating Procedures

6. Traffic Control

A. Hospital Employees not directly involved in the direct care of the patient requiring Airborne Precautions will not be allowed in the rooms.

B. The doors to the rooms will remain closed at all times to maintain negative pressure and avoid disruption of air flow.

C. Nursing has the authority and responsibility to limit visitors and guests as needed for patient, visitors and employee safety.

D. All visitors entering the airborne infection isolation rooms will be required to wear a MAXAIR CAPR, or an N95 mask respirator as minimum.
Appendix D.
Storing MAXAIR between Uses

Recommended Protocol for Storage of MAXAIR Systems Between Routine Uses

The preferred protocol is to use cuffs, shrouds, hoods, and comfort strips one time, and then dispose them per institutional protocol for hazardous materials. The helmet and filter cover are to be thoroughly wiped down after each use, inside and out, except for the comfort strips, with a quaternary ammonium, alcohol, or bleach wipe, or equivalent. (Remove the comfort strips for storage, if necessary.)

A secondary protocol is to thoroughly wipe down the disposable, on all sides, with an alcohol wipe and place the damp disposable along with an alcohol wipe in a plastic bag until the next use. During the storage period, the vapors from the wipe would continue the sanitizing effect. The helmet and filter cover are to be thoroughly wiped down after each use, inside and out, with a quaternary ammonia, alcohol, or bleach wipe, or equivalent.

WARNING: Inspect each system component before use to insure against defects, damage, or residue from cleaning.

DISCLAIMER: This recommendation is based on best efforts of understanding disinfection procedures currently in place for similar items and is not based on laboratory data or specific experimental findings.
Appendix D.
Storing MAXAIR between Uses

Recommended Protocol for Storage of MAXAIR Systems
During Extended Periods of Non-Use

In general, it is recommended that MAXAIR Systems be used on a frequent basis to insure proper functioning and user familiarity, particularly in consideration of a future emergency, pandemic, etc.

Routine use can be accomplished, even for systems primarily designated for emergency preparedness (EP), by periodically cycling groups of systems from EP storage areas through routine use areas where infectious and suspected infectious patients are isolated and cared for. This will allow for periodic change-out of filters, cuffs/shrouds/hoods, comfort strips, recharging of batteries, and verification of proper functioning of motors/blowers and LED Status indicators.

Storage of MAXAIR Systems beyond routine use should only be done in environments that are comparable to normal working environments for health care professionals in terms of temperature, pressure, relative humidity, and the presence of any toxic and corrosive elements.
Appendix D.
Storing MAXAIR between Uses

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ESTIMATED SHELF LIFE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helmets, helmet liners, power cords, filter covers, filter cover caps, DLCs, hooks</td>
<td>Relatively indefinite; 5-7 years</td>
</tr>
<tr>
<td>Filters, hoods, filter cartridges</td>
<td>2-3 years</td>
</tr>
<tr>
<td>Li-Ion Batteries</td>
<td>2-4 years</td>
</tr>
<tr>
<td>Cuffs, shrouds, chin straps</td>
<td>3-5 years</td>
</tr>
<tr>
<td>Comfort strips</td>
<td>3-5 years</td>
</tr>
<tr>
<td>Chargers</td>
<td>Relatively indefinite; 5-7 years</td>
</tr>
</tbody>
</table>

*The amount of filter loading and residue from use will shorten useful life of filter materials and decrease all estimates of shelf life and time between replacements.

If stored for extended periods after potentially contaminating use, it is recommended that all filter materials and disposable items be replaced and that all items* not replaced, including helmets, be thoroughly decontaminated and stored per the secondary protocol of “Recommended Protocol for Storage of MAXAIR Systems Between Routine Uses”.

**WARNING:** Inspect each system component before use to insure against defects, damage, or reside from cleaning.

**DISCLAIMER:** This recommendation is based on best efforts of understanding disinfection procedures currently in place for similar items and is not based on laboratory data or specific experimental findings.
Appendix E.
In-Frequent Use and Storage of Batteries

The Lithium Ion (Li-Ion) batteries that are part of your MAXAIR System are secondary (rechargeable) batteries, not primary (storage) batteries.

They will hold much of their charge for a year or longer. However, as with all rechargeable batteries, the amount of charge will decline slowly in use or storage (self discharge rate), depending on time and temperature, and the maximum recoverable charge level diminishes gradually over the life of the battery.

For routine Infection Control use in the med/surg and ED areas:

If you are repeating the charge-discharge use of the batteries on a monthly basis, leaving the battery on the charger in between uses is recommended.

However, we do not recommend leaving the battery connected to the charger continuously for more than a month at any one time. If this is the case, we recommend that you disconnect them after a month of non-use.

In this instance, the fully charged battery will retain most of its charge for as much as 12 months. If you leave it off the charger longer than a year, we recommend that you fully charge the battery again before use.

For Emergency Preparedness (EP):

MAXAIR batteries are shipped to customers at the 50% charge level (approximately 14.6v output level). This is the approximate level most often recommended for long term storage of a Li-Ion battery, and therefore what we recommend for EP use to achieve the longest overall useful life of the batteries.

On a new 2000-30TSC battery this represents up to 8 hours of use before recharging to a fully charged level. (Approximately 4 hours on a new 2000-36TSC battery.)
Appendix E.
In-Frequent Use and Storage of Batteries

For those systems that may be in storage and not used for even longer than a year, we recommend that you revalidate the charge on a bi-annual, or at minimum, an annual basis.

The following descriptions and tables are provided to assist you in determining what conditions you may wish to use to schedule the amount of time you leave your batteries on their chargers, the amount of time between re-charging, and the charge levels you set for long term storage of the batteries for extended periods of non use (greater than 4 weeks). The most dominant factors that determine how long your battery will last and how much run-time it will have when first put back in service after periods of inactivity, are:

**Storage temperature** – the cooler the better, e.g., placed in a refrigerator is much better than just on an open shelf in a storage room.

**Charge level when put into a “storage mode”** – Full charge is generally okay, however, storing for long periods of time at the 50% charge level has a much stronger benefit for Li-Ion batteries than other battery technologies.

The individual battery technology’s self-discharge rate (see table on page 2) – the rate at which the battery charge level declines while it is just sitting in storage, usually quoted as a decline in %-per-month.

The individual battery technology’s recoverable capacity (see table on page 2) – the amount that a battery can be “fully charged back to” over time, usually quoted as a certain % of the full charge level when the battery was initially manufactured.
Appendix E.
In-Frequent Use and Storage of Batteries

CAUTION: The following table illustrates calculated projections of the best case scenarios. Results may vary.

It is essential that the batteries are tested periodically, with a MAXAIR system, to determine their condition.

Notes:

• Data is extrapolated linearly, year to year from the 1 year data provided by the manufacturer.

• Lithium-Ion battery storage is recommended at cool temperatures, preferably 0 degrees Celsius (32 degrees Fahrenheit); high storage temperatures degrade the battery’s performance at a significantly accelerated rate.

Although we are not aware of extensive studies by battery manufacturers on the subject, recommendations in the literature for storage temperatures for Li-Ion Batteries ranges from about -20º C to +25º C, with 0º C (freezing) to 10º C a good compromise.

• One must remember that these are long term storage recommendations and that when moved from lower temperature conditions to higher temperature conditions condensation likely will form. Time for temperature equilibration must be allowed for the batteries to come to ambient operating conditions and for removal of condensation before being placed back in use with the MAXAIR Helmet.

• Table data is provided at 23 degrees Celsius (73.4 degrees Fahrenheit) and 60 degrees Celsius (140 degrees Fahrenheit) to demonstrate the effects of elevated temperature.

• It is best to store Lithium-Ion batteries when they are 50% charged, not fully charged.
## Appendix E.
In-Frequent Use and Storage of Batteries

### TABLE: Projected Li-Ion Battery Charge Level Available As A % Of Level at Initial Manufacture

<table>
<thead>
<tr>
<th>Year(s) Elapsed from Manufacture Date</th>
<th>Storage Condition: 50% charged</th>
<th>Storage Condition: 100% charged</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residual Capacity (due to Self-Discharge)</td>
<td>Recoverable Capacity</td>
</tr>
<tr>
<td></td>
<td>23° C</td>
<td>60° C</td>
</tr>
<tr>
<td>1</td>
<td>96%</td>
<td>76%</td>
</tr>
<tr>
<td>2</td>
<td>92%</td>
<td>52%</td>
</tr>
<tr>
<td>3</td>
<td>88%</td>
<td>28%</td>
</tr>
<tr>
<td>4</td>
<td>84%</td>
<td>4%</td>
</tr>
<tr>
<td>5</td>
<td>80%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year(s) Elapsed from Manufacture Date</th>
<th>Self-Discharge Loss</th>
<th>Permanent Capacity Loss</th>
<th>Self-Discharge Loss</th>
<th>Permanent Capacity Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23° C</td>
<td>60° C</td>
<td>23° C</td>
<td>60° C</td>
</tr>
<tr>
<td>1</td>
<td>4%</td>
<td>24%</td>
<td>1%</td>
<td>8%</td>
</tr>
<tr>
<td>2</td>
<td>8%</td>
<td>48%</td>
<td>2%</td>
<td>16%</td>
</tr>
<tr>
<td>3</td>
<td>12%</td>
<td>72%</td>
<td>3%</td>
<td>24%</td>
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<tr>
<td>4</td>
<td>16%</td>
<td>96%</td>
<td>4%</td>
<td>32%</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
<td>100%</td>
<td>5%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Glossary

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.
Appendix F. Glossary

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Emergency situation means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.
Appendix F.
Glossary

Escape-only respirator means a respirator intended to be used only for emergency exit.

Exposure limit: The maximum allowable concentration of a contaminant in the air to which an individual may be exposed. These may be time-weighted averages, short-term limits, or ceiling limits.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)
Appendix F. Glossary

Hazard ratio: A number obtained by dividing the concentration of a contaminant by its exposure limit.

Helmet means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

High Efficiency (HE) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.
Appendix F.
Glossary

Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Negative pressure respirator (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen deficient atmosphere means an atmosphere with an oxygen content below 19.5% by volume, or with an oxygen content above 25.0% by volume.
Appendix F.
Glossary

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure demand respirator means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
Appendix F.
Glossary

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Recommended Exposure Limit (REL): An 8- or 10-hour time-weighted average (TWA) or ceiling (C) exposure concentration recommended by NIOSH that is based on an evaluation of the health effects data.

Respiratory inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.
Appendix F.
Glossary

Supplied-air respirator (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

Time weighted average: The average concentration of a contaminant in air during a specific time period.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

Workplace Protection Factor (WPF): A measure of the protection provided in the workplace by a properly functioning respirator when correctly worn and used.