MAXAIR®

CAPR®

Trainer Program

MAXAIR® SYSTEMS protecting you with every breath®
17171 Daimler Street, Irvine, CA 92614 800-443-3842 www.maxair-systems.com

Index

Fundamentals of Respiratory Protection

- Procedures That Could Facilitate Airborne Transmission Risk
- Airborne Transmissible Diseases
- Filter Characteristics
- Common Particle Sizes
- Respirator Classification

Return to Index

Procedures That Could Facilitate Airborne Transmission Risk

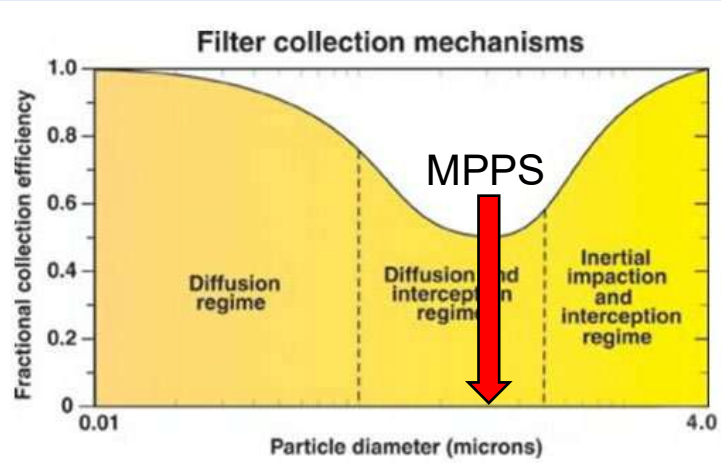
- BiPAP
- Bronchoscopy
- CPAP
- Intubation
- Nebulization
- Sputum induction
- Suctioning
- Noninvasive positive pressure ventilation
- Tracheotomy
- Cardiopulmonary resuscitation
- Nasogastric tube placement
- Thorocentesis
- Esophagogastroduodenoscopy
- Cardiac catheterization
- Exercise tolerance tests
- Pulmonary function tests
- Percutaneous gastric tube placement
- Facial surgery

Airborne Transmissible Diseases

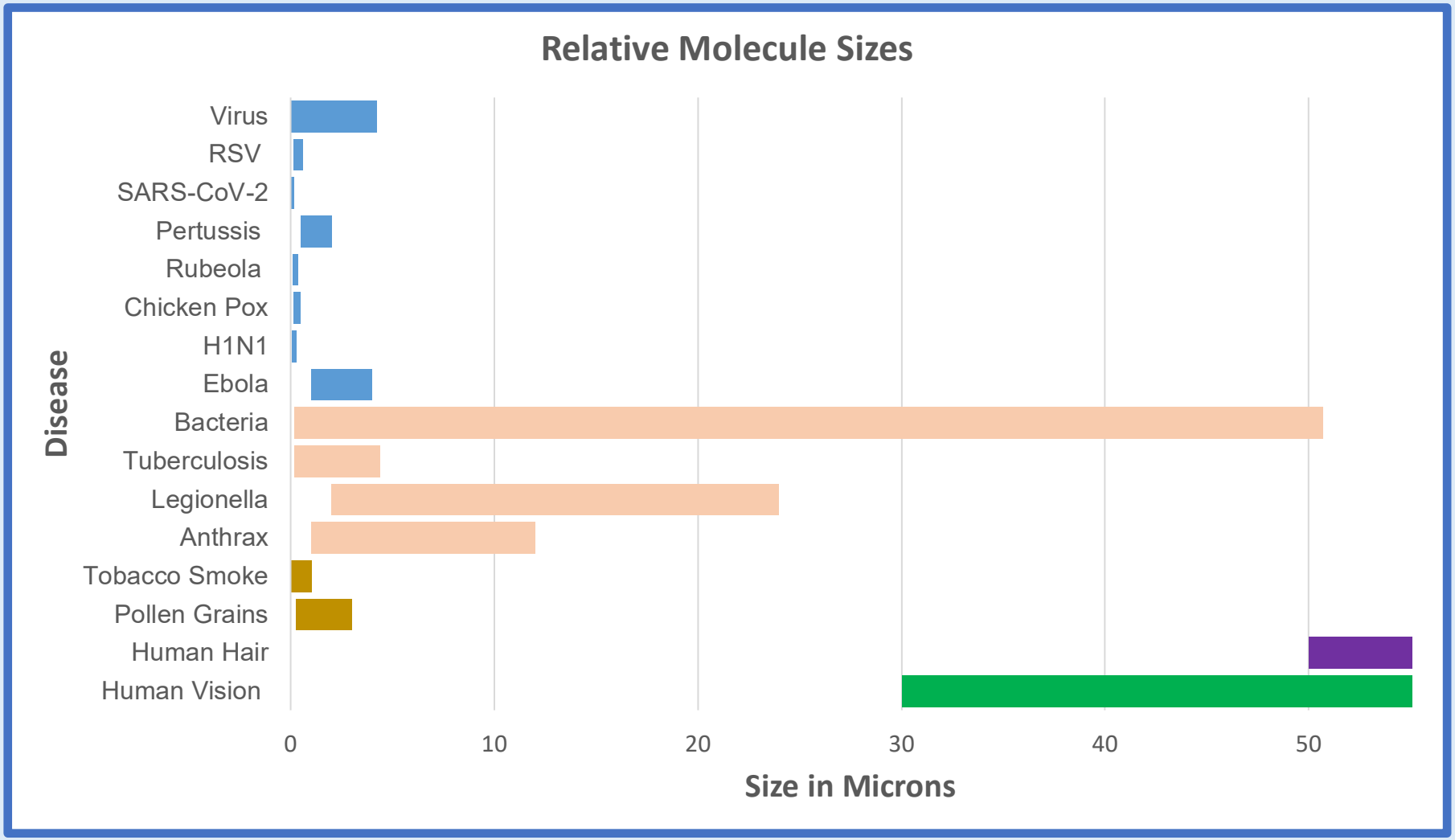
- RSV
- Sars-CoV-2
- Rubeola
- Mumps
- Pertussis
- Varicella
- Common cold
- Influenza
- Anthrax
- Polio
- Rubella
- Strep throat
- Tuberculosis
- Legionella
- Bacterial Meningitis
- SARS
- MERS

Filter Characteristics

- Filter collection mechanisms curve - basic characteristic of particulate filters
- Most Penetrating Particle Size (MPPS)
  - A filter's point of "lowest efficiency"
  - Larger and smaller particles are filtered at higher efficiencies



Common Particle Sizes



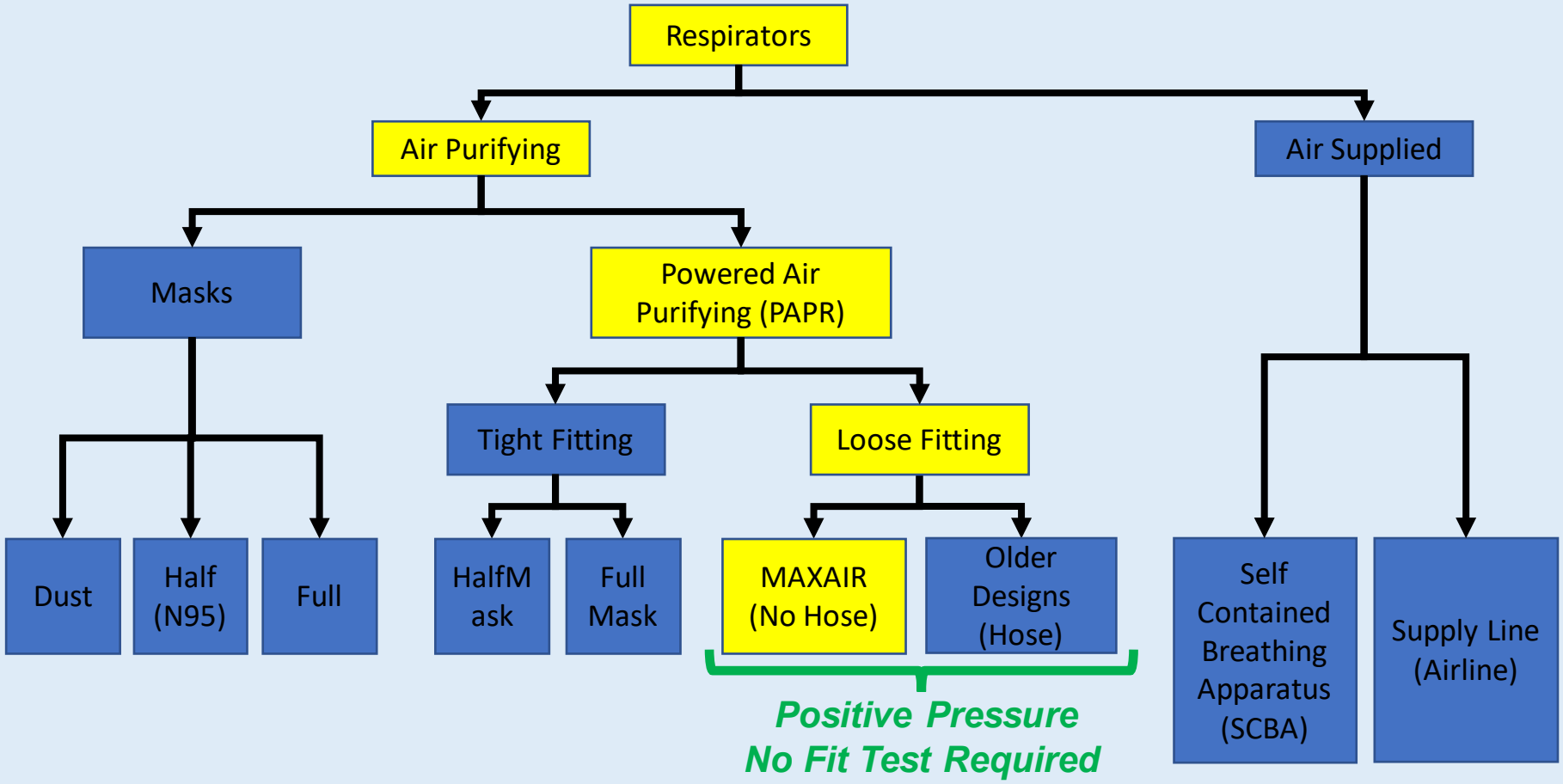
Respirator Classification

- Respirators are generally classified by
  - Source and mechanism of air-flow in/out of the device,
  - Filter characteristics
  - Coverage area on the wearer
  - Fit to the wearer

Respirator Classification

Particulate Filtering Respirators are grouped as Air Purifying or Air Supplying

PAPR and Mask Respirators are Air Purifying Respirators



Introduction to CAPR

- Source – Where does CAPR come from
- What is CAPR
- Regulatory Controls
- Key Advantages and Features
- How CAPR Works
- Base Systems, Peripherals, Accessories, Complete Systems
- Additional Information Resources

Return to Index

Source – Where Does CAPR Come From

- Bio-Medical Devices International, Inc. DBA MAXAIR Systems, founded in 1989, is the exclusive distributor of MAXAIR® brand respiratory protection products for healthcare and dental, EMS, pharmaceutical manufacturing, bio-research labs, restoration, and nuclear markets. **www.maxair-systems.com**
- Syntech International, Inc., with facilities in southern California and Tijuana, Mexico, is the exclusive manufacturer and and regulatory approval holder, including NIOSH, for all MAXAIR® brand products, and complies with all appropriate regulatory organizations. **www.syntech-intl.com**
  - GMP
  - FDA
  - ISO 13485:2016
  - NIOSH
  - CA
  - Dept. of Public Health
- Corporate headquarters are in Irvine, CA

What Is CAPR

- CAPR – Controlled Air Purifying Respirator
- Advanced design loose fitting Powered Air Purifying Respirator (PAPR)
- CAPR provides respiratory protection against aerosolized and airborne droplet particulate contaminants
  - Integrated Helmet
    - No Hose (Breathing Tube)
    - No Waist/Back mounted Blower/Filter Unit
    - Heads-Up-Display: always on and visible Battery and AirFlow status
  - Highly differentiated from conventional PAPRs
    - Comfortable convenience
    - Affordability
    - Performance
    - Reliability

Regulatory Compliance

- MAXAIR CAPR respiratory devices provide protection against aerosolized and airborne droplet particulates under the OSHA 29 CFR 1910.134 Standards for Personal Protective Equipment.
- All MAXAIR CAPR products are approved under NIOSH 42 CFR Part 84, Certification requirements for respiratory protective devices.
- CAPR Systems are Computerized Integrated-Helmet, loose fitting Powered Air Purifying Respirators (PAPRs).

Refer to the User's Instructions, P/N 03521015, for a complete list of warnings, www.maxair-systems.com

Syntech International, Inc. is the exclusive manufacturer and regulatory approval holder, including NIOSH, for all MAXAIR Brand products, www.syntech-intl.com

Key Features and Advantages

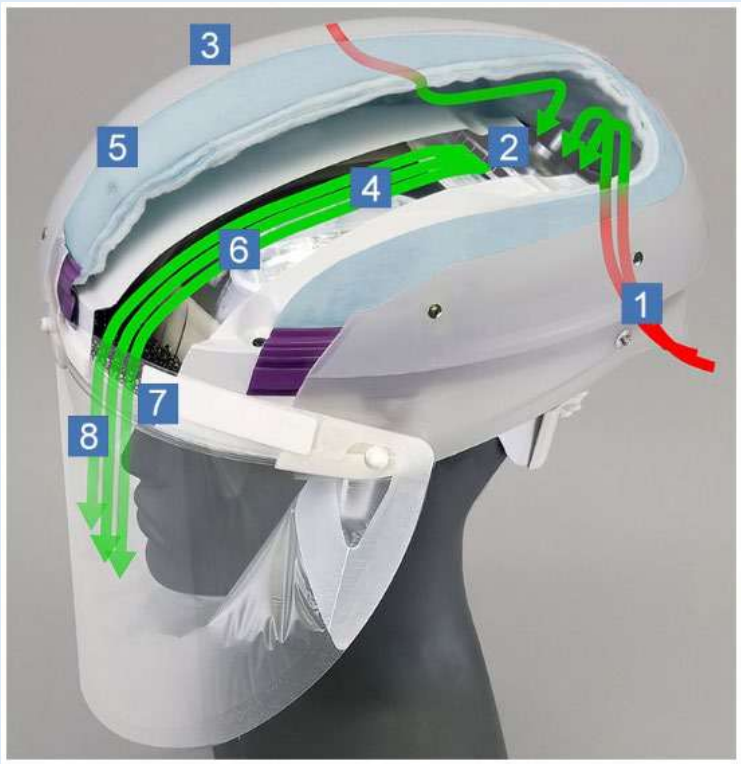
- Compact, lightweight, fewer parts
- Safety Status LEDs – Always Visible in peripheral vision
- Microcomputer Controlled User Adjustable Air Flow
  - Match air flow to work activity level
  - Laminar Flow – Low noise with a comfortable cooling effect
  - Whisper quiet for stethoscope use
- No Hose – no awkward air tube; eliminates chance of catching/snagging
- No waist-mounted Blower Unit – ease, freedom of movement
- Application Flexibility: Convenient Configuration Change
  - Cuff
  - Shroud
  - Hood

Key Features and Advantages

- Simplified De-Contamination
- Cost Effective Disposables
- Non claustrophobic
- Anti-fog lens
- Positive Pressure - Air Cooling Effect
- No heat build-up
- No moisture build-up
- No CO_2 buildup
- No facial pressure points

How It Works

- Toxic Air (1 Red Arrows) is pulled by the Motor (2) in under the FCC (3) (or in through the Hood top, not shown).
- The Toxic Air is then filtered to Clean Air (4 Green Arrows) as the Motor pulls it through the Filter (5).
- After passing down through the blower the Clean Air moves through the Laminar Flow area (6), through the front Air Diffusers (7), and gently down between the Lens and face (8)



Simple, Comfortable, Safe

- Diffused, clean, cooling air passes down around the wearers' face
- CO_2 exhausted automatically
- Lens defogged by airflow automatically

How It Works

The microcomputer controlled blower, integrated into the Helmet, allows the user to adjust the desired air flow level from Low, to Medium, to High, to meet their activity level

Airflow Switch

1 = Low (~190 lpm, ~6.7 cfm)

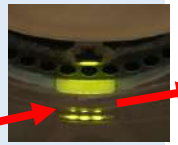
2 = Med (~215 lpm, ~7.6 cfm)

3 = High (~240 lpm, ~8.5 cfm)

How It Works

Safety Status LED Indicators

- The Microcomputer controller uniquely monitors and indicates system air flow and battery charge status
- Status is displayed continuously during real-time use, unobtrusively in the user's 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)

CONDITION	LED				
	Yellow	Green3	Green2	Green1	Red
Battery charge ok 75% to 100% Airflow ok		X	X	X	
Battery charge ok 50% to 75% Airflow ok			X	X	
Battery charge ok 25% to 50% Airflow ok				X	
Battery charge low 0 to 25% Airflow ok					X
Battery charge low Airflow low	X				X
Airflow low Battery charge ok 75% to 100%	X	X	X	X	
Airflow low Battery charge ok 50% to 75%	X		X	X	
Airflow low Battery charge ok 25% to 50%	X			X	

How It Works

Batteries – All MAXAIR configurations are powered by Li-Ion Batteries

- 2500-36TSC is an 4-10 hour per charge battery that suits most applications and is particularly convenient.
- Optional 2500-37TSC is a 6-15 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.
- Both batteries are small and lightweight

2500-36TSC
4-10 hrs/charge

2500-37TSC
6-15 hrs/charge

Base Systems, Peripherals, Accessories, Complete Systems

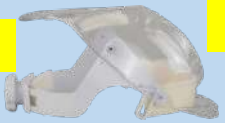
1

Helmet w/ Cage, Liner, and Power Cord

A

Cage

B



Liner

C

Power Cord

Available separately as replacements

2

Battery

3

Belt

4

Charger

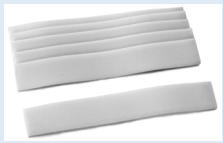
Base Systems consist of choice of -

1 Helmet
1 Battery
1 Belt
1 Charger

Filter Caps/Cartridges For Cuff and Shroud Systems

Filter Cover Cap and Hard Hat for Cuff and Shroud Systems

High Fluid Resistant Filter Cover Cap for Hood Systems



Comfort Strips Front & Back Headband

Perpherals and Accessories depend on desired Complete System Configuration

Refer to User Instructions, P/N 03521015, for a complete listing of CAPR Components, www.maxair-systems.com

Base Systems, Peripherals, Accessories, Complete Systems

Complete Systems

Add the specific Cuff, Shroud, or Hood to the choice of Base System, Peripherals, and Accessories

CUFF 

SHROUD 

HOOD 

Refer to User Instructions (P/N 03521015) and Product Catalog for Cuff, Shroud, and Hood options, www.maxair-systems.com

Cuff and Shroud Complete Systems

Hard Hat Cuff and Shroud Complete Systems

Hood Complete Systems

References

- User Instructions

  For more details regarding your system refer to the CAPR System User Instructions, P/N 03521015, and the package insert User Instructions included with each system component.

- Visit www.maxair-systems.com to view and download:
  - User Instructions
  - Training Videos
  - Other helpful instructional information.

Before and After Routine Use

- Assembly
- Disassembly
- Maintenance
  - Filters
  - Cleaning
  - Decontamination

Return to Index

Assembly - Helmet Liner

- ***The CAPR Helmet is delivered with the Liner and Power Cord preassembled***
- *If the Helmet Liner requires reassembling, follow instructions below*

Align Power Cord with Liner Cord Slot to fit Liner to Helmet without disconnecting the Cord

Place Liner inside Helmet

Secure both top Liner snap holes to top Helmet snaps

Secure both bottom Liner Snap Holes to bottom Helmet Snaps

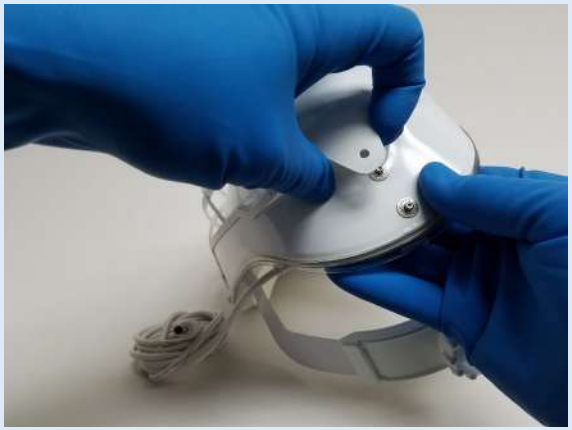
Ensure Liner bottom lip is fully up and against helmet, completely around entire helmet as in A, not as in B.

A - Correct **B - Incorrect**

Disassembly / Assembly - Cage

NOTE: The CAPR Helmet is delivered with the Cage preassembled for Helmet protection during shipping. The Cage needs to be removed if a Filter Cartridge is to be used.

Alternately unsnap each Cage side Snap Tab from the Helmet side Snap.



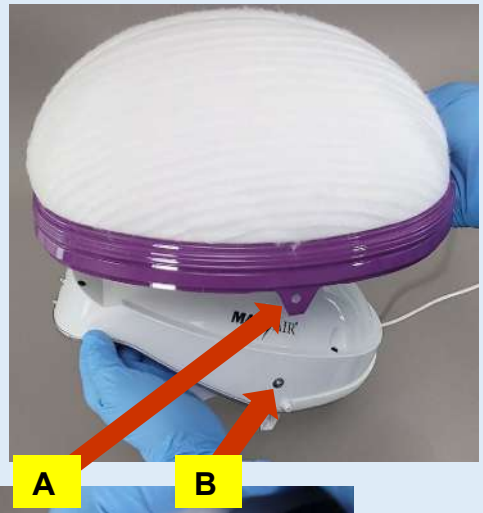
Unsnap the Cage rear Snap Tab from the Helmet rear top Snap.

Lift Cage up and off the Helmet. Store Cage in a safe location for later use as may be necessary.

***Note**: Assemble by reversing this Disassemble process*

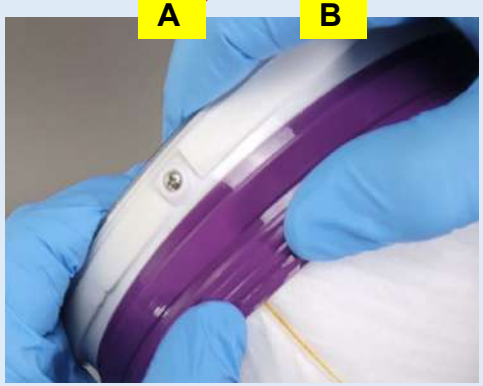
Assembly – Filter Cartridge

NOTE: Your Helmet may have shipped with a Cage snapped to its top for Blower protection during shipping. Before assembly of a Filter Cartridge, 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.



Place Filter Cartridge over Helmet (without Cage)

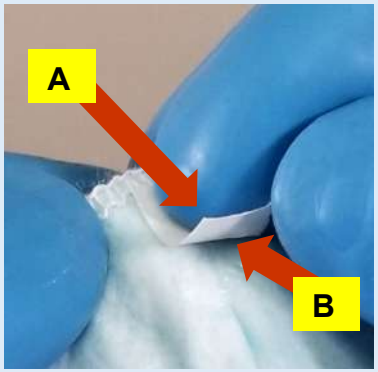
Secure Cartridge rear by pressing rear tab down on snap



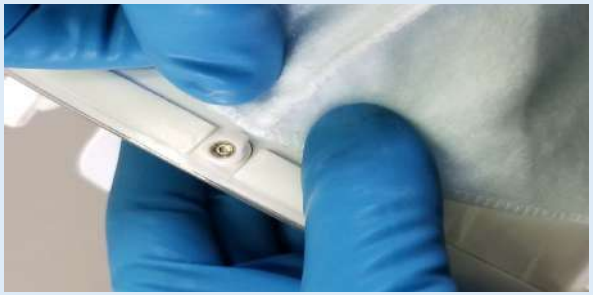
Grasp Helmet front bottom with fingers, press thumbs down on the Cartridge retainer ring until the side tab holes (A) are over the Helmet side Snaps (B)

Secure both left and right side tabs by pressing tabs down on snaps

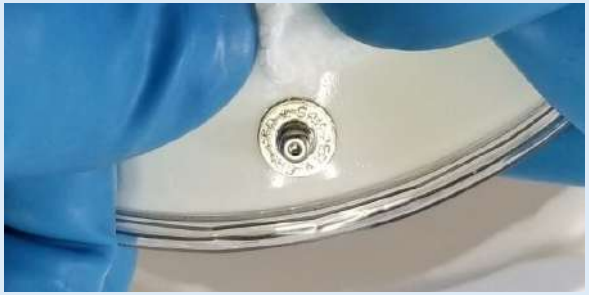
Assembly – Filter Cap



NOTE: Peel off the protective cover (A) from the adhesive strips (B) before each of the next steps



Place Filter Cap over Helmet and align its center front bottom just above Helmet Front Lens Mount and press adhesive firmly to Helmet.



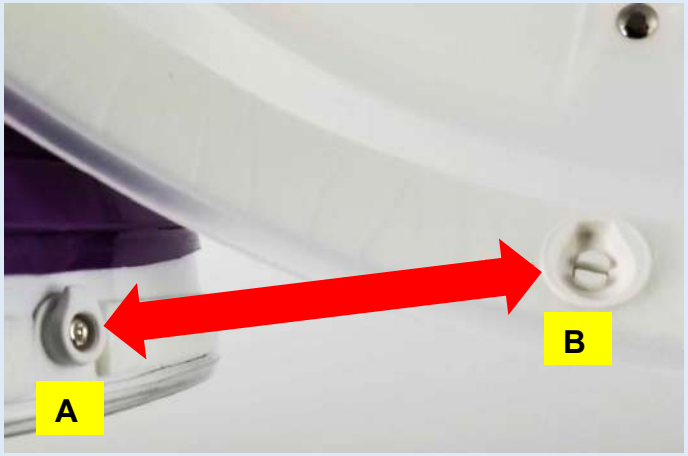
Pull Filter Cap down to Helmet back just above Helmet back bottom snap and press adhesive firmly to Helmet.

Alternately pull each side of Filter Cap down to just cover each Cage side tab and press adhesive firmly to Helmet.

***Note**: Disassemble simply by lifting the Filter Cap at each adhesive, up and off the Helmet.*

Discard used Filter Caps per institution's protocol for contaminated waste.

Assembly - Filter Cover Cap (FCC)



Securely hold the Helmet Front Adapter (A) into the inside of the FCC Front Adapter (B).

Pull the FCC over the top and down onto the Helmet (with Filter already assembled to Helmet).

Pull the FCC fully down on the Helmet to align the FCC T-Tab snap hole over the Helmet rear bottom Snap

Ensure the T-Tab is fully secure on the Helmet Snap – should feel/hear a slick click when secured.

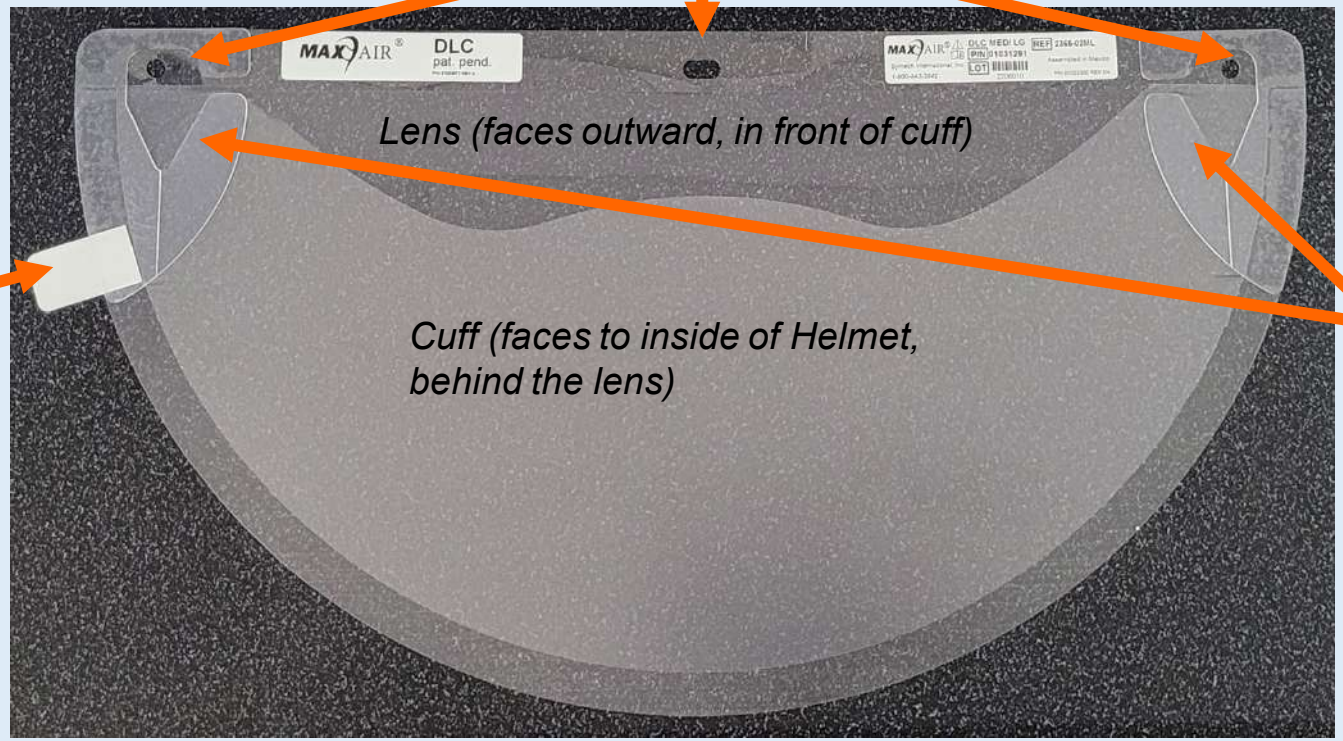
DLC (Disposable Lens Cuff)

VERY IMPORTANT - Ensure Proper Fit of the DLC

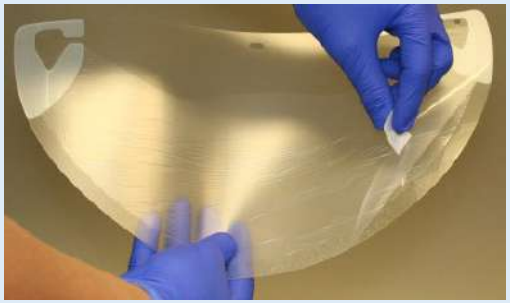
"ML" is for most head sizes; "SM" is for very small head sizes

2365-02SM

2365-02ML

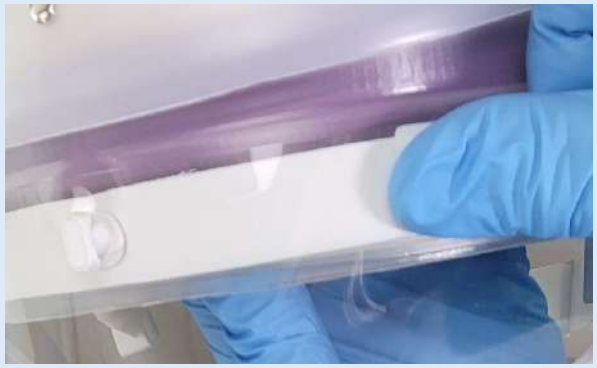


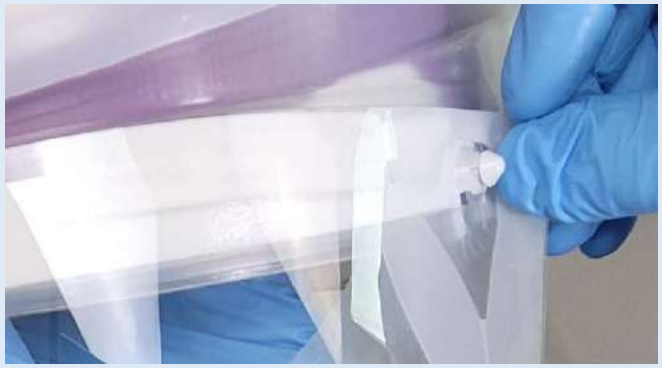
Assembly: DLC



Before donning the System, remove the Lens Protective liner from the Lens - pull the Peel Tab (A) up and from right to left.,

With it horizontal, place the DLC Lens center mount hole over the FCC front TurnClip. Place the TurnClip Vertically to lock the DLC Lens front in position.





While pressing Lens against FCC Foam Strip, slide fingers along the Lens to one side and snap the DLC side Lens hole over the FCC side Lens mount. Repeat for other side.

Disassembly: Cuff

Turn FCC front TurnClip horizontally.

Grasp each DLC Flapper and pull outward away from the Helmet.

Continue to pull DLC outward and forward until completely off the Helmet.

Discard used DLCs per Institutional protocol for contaminated waste.

Disassembly: FCC

Hold Helmet in one hand with thumb on outside of FCC and fingers on inside of Liner.

With the other hand, lift up on FCC T-Tab to unlatch it from Helmet Snap.

Lift T-Tab with one hand while with other hand push FCC up with thumb and pull Helmet/Liner down with fingers to remove FCC from Helmet.

Disassembly: Filter Cartridge

Gently lift each Cartridge side snap tab off of Helmet snap.

Lift rear snap tab off of Helmet snap and continue lifting Filter Cartridge up and off Helmet.

Discard used Filter Cartridges per Institutional protocol for contaminated waste.

Disassembly: Liner

Before proceeding, ensure the Power Cord is aligned with the Liner Power Cord Slot.

Hold the Helmet/FCC in one hand. With the other hand's thumb over the front of the Helmet/FCC, grasp the inside of the Liner just above the front Comfort Strip with the fingers.

Unsnap the two front snaps by pulling the front of the Liner down and away from the Helmet with the fingers. Continue pulling the Liner away until the two rear snaps release and the Liner is free of the Helmet.

Maintenance: Filters

For any of the following conditions, have the CAPR filter checked for the need for replacement with a new one. Discard the old filter per the institution's protocol for contaminated waste.

- If blood and/or bodily fluids contaminate the filter.
- If the filter becomes damaged or breathing resistance increases.
- If the Yellow Led Safety indicator is lighted, other than during the power-up light test, check for any possible compromise of safe filter performance. When in doubt, it is best to replace the filter until another solution is clearly identified

Maintenance: General Cleaning

IMPORTANT - Do not immerse Helmet w/fan module in water or other liquid

General Cleaning for all reusable components:

Supplies Needed:	Frequency:	Accomplishes:
● Clean Damp Cloth ● Cleaning Agent: Mild application of skin friendly soap.	● Wipe between uses and between different users wearing the system.	● Reduces cross contamination. ● Extends useful life. ● Improves hygiene.
Procedure:		
1. Use a damp cloth with cleaning agent to clean all outer and inner exposed surfaces.	2. Let air dry.	

Maintenance: Decontamination

IMPORTANT - Do not immerse Helmet w/fan module in water or other liquid

Warning

Prior to use of any cleaning agent on any material, it is always recommended to try the agent on a test sample to determine short and long term effects for overall product and user safety.

MAXAIR Systems is not responsible for results of any cleaning procedures that are outside of full compatibility, simultaneously with the cleaning agents and protocols included in this Technical Bulletin and with the cleaning agent manufacturers' recommendations regarding the Key Materials listed herein.

MAXAIR Systems has determined that the following cleaning agents are safe to use on the multi-use, non-disposable components of MAXAIR Systems:

Refer to Technical Bulletin TB-MAXAIR Cleaning, maxair-systems.com

Agent #	Active Ingredient	Brand	Model	PN	QTY
1	Quaternary Ammonium/ Isopropyl Alcohol	PDI (Professional Disposables International, Inc.)	Super Sani-Cloth Germicidal Disposable Wipe	Q55172	1 Container
2	Hydrogen Peroxide	Clorox	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectants	CLO30825	1 Container

Maintenance: Decontamination

RECOMMENDED CLEANING PROTOCOL - Agent 1

Agent	Step	Procedure
Super Sani-Cloth Germicidal Disposable Wipe	1	Wear proper protective gloves and other PPE as appropriate.
	2	If there is visible detection of dust, dirt, blood or other organic material, use one or more wipes to remove as necessary.
	3	Wipe top surfaces of the article for a minimum of two minutes. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the two minutes; a minimum total of two wipes is recommended. Use additional wipes as needed.
	4	Wipe bottom surfaces of the article for a minimum of two minutes. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the two minutes; a minimum total of two wipes is recommended. Use additional wipes as needed.
	5	Discard used wipes per institutional protocol for contaminated waste.
	6	Let air dry for a minimum of 30 minutes.

Maintenance: Decontamination

RECOMMENDED CLEANING PROTOCOL - Agent 2

Agent	Step	Procedure
Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectants	1	Wear proper protective gloves and other PPE as appropriate.
	2	If there is visible detection of dust, dirt, blood or other organic material, use one or more wipes to remove as necessary.
	3	Wipe top surfaces of the article for a minimum of one minute. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the one minute; a minimum total of two wipes is recommended. Use additional wipes as needed.
	4	Wipe bottom surfaces of the article for a minimum of one minute. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the one minute; a minimum total of two wipes is recommended. Use additional wipes as needed.
	5	Discard used wipes per institutional protocol for contaminated waste.
	6	Let air dry for a minimum of 30 minutes.

Routine Use

- Warnings and Cautions
- Filter Check
- Don / Doff
- Cleaning
- Decontamination

Return to Index

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

Refer to the User's Instructions, P/N 03521015, for a complete list of warnings, www.maxair-systems.com

Warnings

- Do not use if airflow is less than 6 cfm (cubic feet of air per minute)
- Damaged and worn Filters must be replaced immediately.
- Never attempt to repair a damaged Hood, Cuff, Shroud, Filter, or Filter Cover/Cap.
- Never use compressed air to clean MAXAIR Systems or Filters.
- All MAXAIR Systems Filter and Helmet configurations must be configured as described herein to maintain compatibility with NIOSH approval.

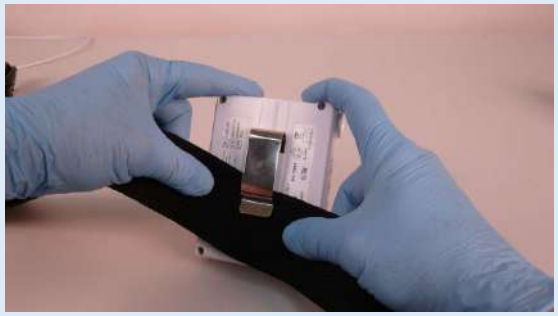
Refer to the User's Instructions, P/N 03521015, for a complete list of warnings, www.maxair-systems.com

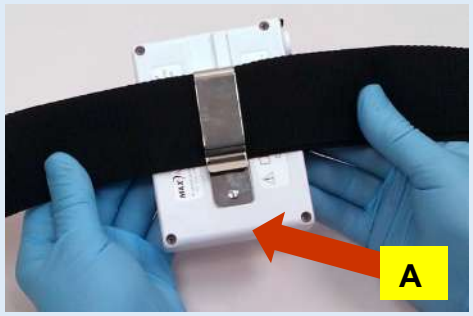
Cautions

- The purchaser/user is responsible for determining the appropriateness of their MAXAIR Systems for each/any of their applications and environments.
- All filters used with MAXAIR Systems have a finite useful life which is affected by:
  - The amount of contaminant 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 chosen for use.

Refer to the User's Instructions, P/N 03521015, for a complete list of warnings, www.maxair-systems.com

Assemble and Don / Doff: Battery & Belt





Ensure the Clip Detent rests on the Clip base, metal to metal (A)

Clip the Li-Ion battery to the battery belt

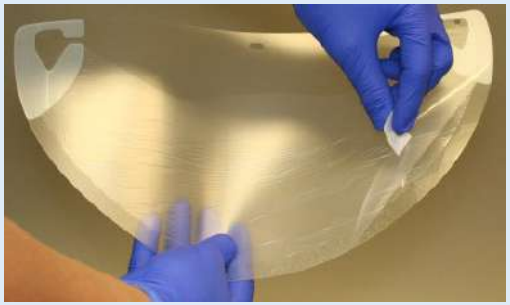
Adjust belt length for proper fit & secure around waist

Note: Battery over right hip is recommended.

***Note**: Doff by reversing the Donning process*

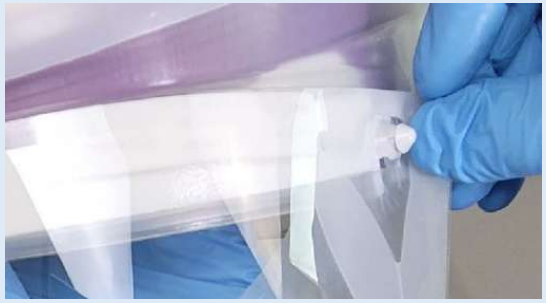
Assembly: DLC

If a DLC (Disposable Lens Cuff) is not already assembled to the Helmet, perform the following before proceeding with Donning.



Before donning the System, remove the Lens Protective liner from the Lens - pull the Peel Tab (A) up and from right to left.

With it horizontal, place the DLC Lens center mount hole over the FCC front TurnClip. Place the TurnClip Vertically to lock the DLC Lens front in position.



While pressing Lens against FCC Foam Strip, slide fingers along the Lens to one side and snap the DLC side Lens hole over the FCC side Lens mount. Repeat for other side.

***Note**: Disassemble by reversing this assemble process*

Discard used DLCs per Institutional protocol for contaminated waste.

Don / Doff: Cuff System (DLC)

Ensure air flow is initiated before donning the Helmet with a headcover.

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 mechanism.

Before donning, turn Ratchet Knob counterclockwise for easy fit over head.

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

After donning, tighten ratchet band by turning ratchet knob clockwise for most secure and comfortable fit

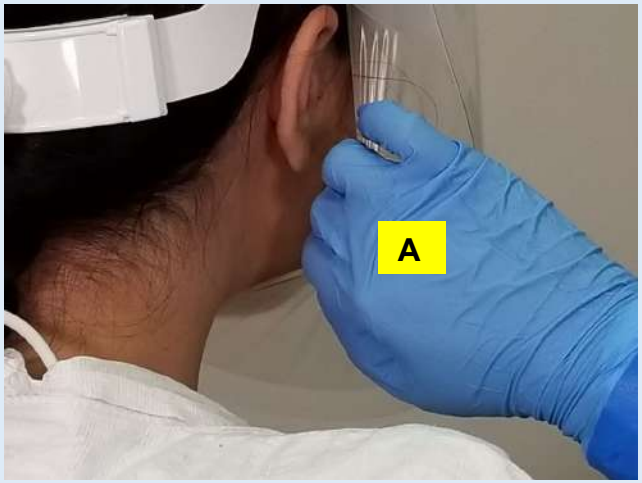
***Note**: Doff by reversing the Donning process*

Don / Doff: Cuff System (DLC)

VERY IMPORTANT - Ensure Proper Fit of the DLC

Proper fit is when A , B and C are achieved -

A. Slight 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 sides are in front of the Liner Side Tabs and within ~¼ inch of both temples
C. The bottom of the front Headband is within ≤ ½ inch of the eyebrows, for proper vision of the LEDs

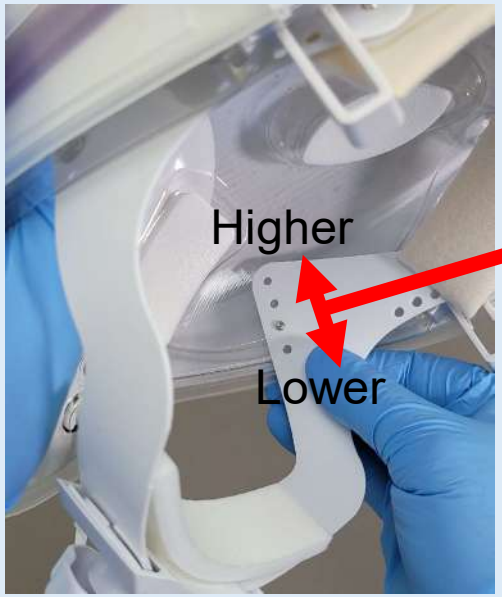


IMPORTANT: If all conditions are not met, switch to the other size DLC

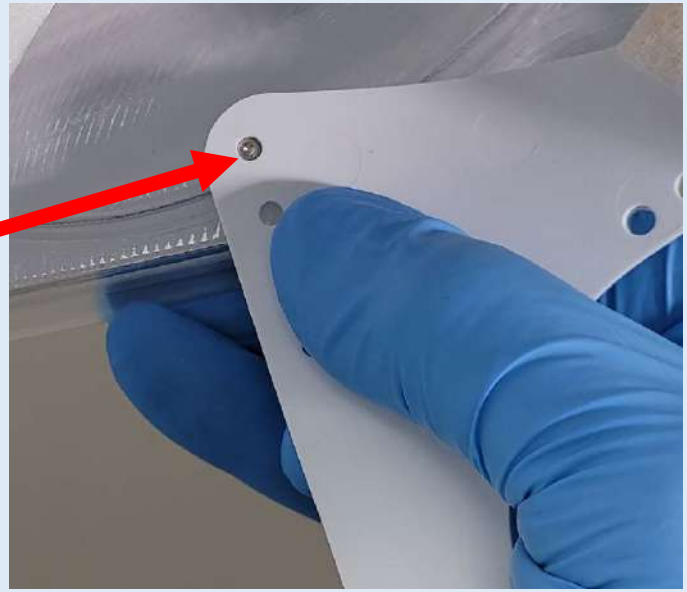
Adjustments: Helmet Fit

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 Height Position and re-don



Check Headband Adjustment positions for secure donning for all required activities



Reposition appropriately with both sides at the same level

Higher for larger head sizes and to set Helmet lower on the head. Lower for smaller head sizes and to set Helmet higher on the head.

Safety LED Display

LED Safety indicator lights, always on and visible in the user's peripheral vision during use, provide advanced warning if proper air flow and battery run time need attention.

This HUD (Heads Up Display) eliminates the need for additional airflow and battery test equipment

- **Green LEDs** – Indicate three stages of battery charge remaining
  - 3 Green: ~ 75%-100% charge remaining
  - 2 Green: ~ 50%-75% charge remaining
  - 1 Green: ~ 25%-50% charge remaining

- **Red LED – Low Battery, exit to a safe place as soon as possible**
  - When lit, user has ~15 minutes to change out battery
  - Check for damages to battery (i.e.. Cracks)
  - Replace with a fully charged battery if necessary

- **Yellow LED – Low Airflow, exit to a safe place as soon as possible**
  - System is approaching lower limit of Safe Airflow (~ 170 lpm)
  - Immediately check for proper function of the helmet
  - Replace Filter Cartridge if damaged or dirty or its function is otherwise compromised

NOTE: All LEDs light for ~ 5-8 seconds on power-up as a light test.

User Maintenance: Front Comfort Strip

Remove the Front Comfort Strip by peeling up one end of the Strip and continue pulling to remove completely from the Headband.

Attach the center of a new Comfort Strip to the center Headband Velcro.

Smooth the new Strip to each side Headband Velcro Strip.

User Maintenance: Rear Comfort Strip

The Rear Comfort Strip is closed cell foam and may be cleaned with a decon wipe and reused. To remove, peel up one end from the Liner rear Headband and pull it away and off the Headband.

Attach the center of the new Strip Velcro to the center of the Back Headband Velcro.

Ensure the new Strip is parallel and centered on the back Headband.

Maintenance: General Cleaning

IMPORTANT - Do not immerse Helmet w/fan module in water or other liquid

General Cleaning for all reusable components:

Supplies Needed:	Frequency:	Accomplishes:
● Clean Damp Cloth ● Cleaning Agent: Mild application of skin friendly soap.	● Wipe between uses and between different users wearing the system.	● Reduces cross contamination. ● Extends useful life. ● Improves hygiene.
Procedure:		
1. Use a damp cloth with cleaning agent to clean all outer and inner exposed surfaces.	2. Let air dry.	

Maintenance: Decontamination

IMPORTANT - Do not immerse Helmet w/fan module in water or other liquid

Warning

Prior to use of any cleaning agent on any material, it is always recommended to try the agent on a test sample to determine short and long term effects for overall product and user safety.

MAXAIR Systems is not responsible for results of any cleaning procedures that are outside of full compatibility, simultaneously with the cleaning agents and protocols included in this Technical Bulletin and with the cleaning agent manufacturers' recommendations regarding the Key Materials listed herein.

MAXAIR Systems has determined that the following cleaning agents are safe to use on the multi-use, non-disposable components of MAXAIR Systems:

Refer to Technical Bulletin TB-MAXAIR Cleaning, maxair-systems.com

Agent #	Active Ingredient	Brand	Model	PN	QTY
1	Quaternary Ammonium/ Isopropyl Alcohol	PDI (Professional Disposables International, Inc.)	Super Sani-Cloth Germicidal Disposable Wipe	Q55172	1 Container
2	Hydrogen Peroxide	Clorox	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectants	CLO30825	1 Container

Maintenance: Decontamination

RECOMMENDED CLEANING PROTOCOL - Agent 1

Agent	Step	Procedure
Super Sani-Cloth Germicidal Disposable Wipe	1	Wear proper protective gloves and other PPE as appropriate.
	2	If there is visible detection of dust, dirt, blood or other organic material, use one or more wipes to remove as necessary.
	3	Wipe top surfaces of the article for a minimum of two minutes. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the two minutes; a minimum total of two wipes is recommended. Use additional wipes as needed.
	4	Wipe bottom surfaces of the article for a minimum of two minutes. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the two minutes; a minimum total of two wipes is recommended. Use additional wipes as needed.
	5	Discard used wipes per institutional protocol for contaminated waste.
	6	Let air dry for a minimum of 30 minutes.

Maintenance: Decontamination

RECOMMENDED CLEANING PROTOCOL - Agent 2

Agent	Step	Procedure
Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectants	1	Wear proper protective gloves and other PPE as appropriate.
	2	If there is visible detection of dust, dirt, blood or other organic material, use one or more wipes to remove as necessary.
	3	Wipe top surfaces of the article for a minimum of one minute. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the one minute; a minimum total of two wipes is recommended. Use additional wipes as needed.
	4	Wipe bottom surfaces of the article for a minimum of one minute. Ensure all corners and crevices are wiped thoroughly. Ensure all surfaces are continuously wet during the one minute; a minimum total of two wipes is recommended. Use additional wipes as needed.
	5	Discard used wipes per institutional protocol for contaminated waste.
	6	Let air dry for a minimum of 30 minutes.

Battery Charging

When finished wearing the CAPR System Headcover, 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 to a powered on 2600-02[1] 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.

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

1 For details on charging refer to User Instructions and Ensure Readiness Program. If you have older MAXAIR chargers, refer to Ensure Readiness Sale. www.maxair-systems.com.

Battery Charging

CHARGING INSTRUCTIONS

1. Connect charger to an appropriate 110v wall outlet – Flashing Green light will come on to indicate Battery not connected
2. Connect battery to charger – Yellow-Orange light will come on if battery needs charging. During charging Yellow-Orange will change from constant to flashing as charging progresses. (If Green light stays on, Battery is charged and usable.
3. When charging is complete, Green light will come on and battery is ready for use.

LED'S INDICATE CHARGER STATUS

FLASHING GREEN – Charger powered up; Battery not connected.

2 Red Blinks - Battery is connected with wrong polarity.

3 Red Blinks - Charger output is shorted.

4 Red Blinks - Battery voltage low and may need replacing.

5 Red Blinks - Safety timer has run out - battery should be replaced.

LED Off - Battery voltage is too high - battery should be replaced.

Battery Charging

- 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 40-50% charge
- This ensures ~ 4-5 hours of emergency use prior to being fully charged

2500-36TSC **2500-37TSC**

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 Instructions and Ensure Readiness Program for details.
www.maxair-systems.com

Additional Information Appendices

- A. Training and Competency Checklist
- B. Annual Review Test Questions
- C. Example SOP
- D. Storing CAPR Between Uses
- E. Infrequent Use and Storage of Batteries
- F. Glossary

Return to Index

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 & MAINENANCE
  - 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 approxiamtely 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

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.

Appendix C.
Example Standard Operating Procedures

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.

Appendix C.
Example Standard Operating Procedures

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 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 *re-coverable 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 +25^{o} C, with 0^{o} C (freezing) to 10^{o} 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

Year(s) Elapsed from Manufacture Date	Storage Condition: 50% charged				Storage Condition: 100% charged			
	Residual Capacity (due to Self-Discharge)		Recoverable Capacity		Residual Capacity (due to Self-Discharge)		Recoverable Capacity	
	23° C	60° C	23° C	60° C	23° C	60° C	23° C	60° C
1	96%	76%	99%	92%	90%	60%	94%	80%
2	92%	52%	98%	84%	80%	20%	88%	60%
3	88%	28%	97%	76%	70%	0%	82%	40%
4	84%	4%	96%	68%	60%	0%	76%	20%
5	80%	0%	95%	60%	50%	0%	70%	0%
Year(s) Elapsed from Manufacture Date	Self-Discharge Loss		Permanent Capacity Loss		Self-Discharge Loss		Permanent Capacity Loss	
	23 deg C	60 deg C	23 deg C	60 deg C	23 deg C	60 deg C	23 deg C	60 deg C
1	4%	24%	1%	8%	10%	40%	6%	20%
2	8%	48%	2%	16%	20%	80%	12%	40%
3	12%	72%	3%	24%	30%	100%	18%	60%
4	16%	96%	4%	32%	40%	100%	24%	80%
5	20%	100%	5%	40%	50%	100%	30%	100%

Appendix F. Glossary

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.