3M™ Breathe Easy™ Powered Air Purifying Respirators (PAPRs)

Always read and follow all User Instructions
Opening Points

• This presentation is based on current United States federal requirements as of April, 2021. US, state or other country requirements may be different. Always consult User Instructions and follow local laws and regulations.

• This presentation contains an overview of general information and should not be relied upon to make specific decisions. Completing this program does not certify proficiency in safety and health.

• Information is current as of April 2021, and requirements can change in the future.

• This presentation should not be relied upon in isolation, as the content is often accompanied by additional and/or clarifying information or discussion.

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Breathe Easy PAPR System Components

Hoods
- BE-10 Tychem® QC
- Butyl Rubber

Breathing Tube

Motor Blower, Belt, Flow Meter, Cartridges (3)

Batteries & Charges

Discontinued
3M™ Breathe Easy Powered Air Purifying Respirators

CBRN System for Emergency Preparedness

- CBRN PAPR Kits:
  - RBE-L10
  - RBE-10BR

Note: New Rechargeable Battery System
Replaces BP-15 battery in certain configurations:
- RBE-600

Convert over to Biological Configuration

3M S Series Hoods Options
Small/Large
- S-403S-20
- S-403L-20

3M Breathing Tube
- BE-324

3M HEPA Filters
- 450-00-01R12
Use Considerations

• The Breathe Easy PAPR, in certain configurations, is NIOSH approved for use in certain CBRN events.
• In many cases it is paired with other PPE as part of an US EPA Level C ensemble.
• The motor blower draws contaminated air through a cartridge and blows filtered air up into head covering
• When properly used, the Breathe Easy PAPR helps reduce respiratory exposure to gases, vapors and particles including biological and radiological aerosols
• When used with the S-403 or BE-10BR hood, it may reduce respiratory exposure by a factor of 1000.
• Not for use with contaminant concentrations that are immediately dangerous to life or health (IDLH)
• Not for use in oxygen deficient environments (< 19.5%)
<table>
<thead>
<tr>
<th>Hoods</th>
<th>Model BE-10</th>
<th>Model S-403</th>
<th>Model BE-10BR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material:</strong></td>
<td>Tychem™ QC</td>
<td>Polypropylene coated nonwoven polypropylene</td>
<td>Butyl Rubber</td>
</tr>
<tr>
<td><strong>Seams:</strong></td>
<td>Unsealed</td>
<td>Unsealed</td>
<td>Sealed</td>
</tr>
<tr>
<td><strong>Suspension:</strong></td>
<td>Integrated</td>
<td>Integrated</td>
<td>Integrated</td>
</tr>
<tr>
<td><strong>Reusable:</strong></td>
<td>Not designed to be reusable</td>
<td>Not designed to be reusable</td>
<td>May be cleaned and reused for training. Typically discarded after actual event.</td>
</tr>
<tr>
<td><strong>Typical Use:</strong></td>
<td>Non-CBRN particulate protection (including biologicals), limited liquid splash due to unsealed seams</td>
<td>Non CBRN particulate protection (including biologicals), limited liquid splash due to unsealed seams</td>
<td>CBRN events, including First Receiver operations involving patient decon.</td>
</tr>
<tr>
<td><strong>Filters/Cartridges:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- NIOSH approved for use with all Breathe Easy filters and cartridges – Except RBE-57 (CBRN cartridge)</td>
<td>- NIOSH approved for use with all Breathe Easy filters and cartridges – Except RBE-57 (CBRN cartridge)</td>
<td>- RBE-57 (NIOSH CBRN cartridge)</td>
<td></td>
</tr>
<tr>
<td>- Approved for use with FR-57 Cartridges</td>
<td>- Approved for use with FR-57 Cartridges</td>
<td>- FR-57 (NIOSH OV/AG/HE cartridge with 3M testing for certain riot control and chemical warfare agents)*</td>
<td></td>
</tr>
</tbody>
</table>

*Requires BE-324 Breathing Tube

*Refer to TDB #155 for more information

Always read and follow all User Instructions

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Rechargeable Li-ion Battery TR-630

- Used with Battery Adapter TR-659 and Easy Clean Holster TR-657
- Low voltage indicator light located on top of TR-659 Battery Adapter
  - With system running, steady red light indicates that battery must be recharged
  - After red light comes on, battery pack will shut down in 15 minutes if not recharged
- Storage: -22° to 122° F (-30° to 50° C), dry (< 85% relative humidity)

Always read and follow all User Instructions
# TR-630 Battery Specs

<table>
<thead>
<tr>
<th>Chemistry</th>
<th>Lithium-ion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge Time</td>
<td>approx. &lt; 4.5 hours, 90% in &lt; 3.5 hours</td>
</tr>
<tr>
<td>Max Time on Charger</td>
<td>Indefinite</td>
</tr>
<tr>
<td>Battery Charging*</td>
<td>Range: 32° - 104°F (0° - 40°C) Optimal: 68° - 77°F (20°C - 25°C)</td>
</tr>
<tr>
<td>*Based on the internal temperature of the battery</td>
<td></td>
</tr>
<tr>
<td>Run Time</td>
<td>TR-630 with TR-659 Battery Adapter: approx. 9 hours¹</td>
</tr>
<tr>
<td>Weight</td>
<td>TR-630 with TR-659 Adapter: approx. 1.3 lbs (590 grams)</td>
</tr>
</tbody>
</table>

¹ Clean filter and new, fully charged battery pack
TR-630 Charge Indicator

100% - 80% 80% - 60% 60% - 40% 40% - 20% 20% - <5%

Always read and follow all User Instructions
Battery Chargers For TR-630

TR-641 Single-Station Battery Charger Kit

TR-644 Four-Station Battery Charger Kit

Always read and follow all User Instructions
## Battery Charger Display

![Battery Charger Display Image]

<table>
<thead>
<tr>
<th>Charge Status</th>
<th>Orange LED</th>
<th>Green LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick Charge</td>
<td>On – Steady</td>
<td>Off</td>
</tr>
<tr>
<td>Trickle Charge</td>
<td>On – Steady</td>
<td>On – Slow Flash</td>
</tr>
<tr>
<td>Fully Charged</td>
<td>Off</td>
<td>On – Steady</td>
</tr>
<tr>
<td>Error</td>
<td>On – Quick Flash</td>
<td>On – Quick Flash</td>
</tr>
<tr>
<td>Battery internal temperature</td>
<td>On – Slow Flash</td>
<td>Off</td>
</tr>
<tr>
<td>too hot or cold.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Chargers and Batteries for the TR-600 User Instructions for additional information
TR-630 Lot Code

The LOT code is formatted as (YYWWX):

YY = year of manufacture
WW = week of year
X = ignore

Your battery has a LOT code of 14231. This means that your battery was manufactured: 23rd week of 2014, or the week of June 8th, 2014.
Rechargeable NiMH Battery BP-15

- Up to 8 hour run time (less at high or low temperatures)
- Storage: -4° to 115° F (-20° to 45° C), dry (< 85% relative humidity)
- Low voltage indicator light located on top of battery
- Color strip indicates year of manufacture
- Up to 400 charge/discharge cycles
- A new battery must be fully charged and completely discharged three times to reach full capacity
BC-210 Charger

- Can link up to 10 chargers together
- Charges battery in 4 hours (90% charge in two hours)
- Batteries may be charged any time during discharge cycle
- Recommended storage method is to leave battery on charger
- If a battery feels hot, let it cool for 1/2 hour before charging.
- Do not charge batteries stacked together, on top of charger, or in an enclosed cabinet
  - Heat must be allowed to dissipate
3M™ Battery Pack, Lithium

- Non-rechargeable.
- 12 hour run time. Grid printed on side of label allows user to mark number of hours used.
- 10 year shelf life. A manufacturing date code (MM/YY) is printed on the side of the label.
- 32°F to 120°F (0°C to 48°C) operating temperature.
- After final use, the battery should be completely discharged using the de-activation device located on the top of the battery. See User Instructions for further information.
- May wish to train with rechargeable NiMH batteries and store PAPRs with lithium batteries
- May not be shipped on passenger aircraft

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Cartridges

3M™ Cartridge FR-57
- Use with BE-10 or BE-10BR hood
- NIOSH Approved: Organic vapor, chlorine, hydrogen chloride, chlorine dioxide, sulfur dioxide, ammonia, methylamine, formaldehyde, hydrogen fluoride or HEPA.

3M™ Cartridge RBE-57 (CBRN)
- NIOSH approved: Organic vapor, chlorine, hydrogen chloride, sulfur dioxide, ammonia, alpha chloroacetophenone (CN), ortho chlorobenzylidene malonitrile (CS) or phosphine; and HEPA
- All known biological and many chemical warfare agents*

*Refer to TDB # 180 for more information
Cartridge Replacement

The cartridges must be changed if:

• The cartridge is expired (5 year shelf life)
• The cartridge has been physically damaged
• The PAPR does not pass the air flow test with a properly charged battery
• Required by administrative procedures, including infection control guidelines
• According to a cartridge change schedule
• Depends on contaminant, concentration, temperature, relative humidity, flow rate, etc.
• Please contact 3M’s Technical Service to inquire about cartridge change out schedule at 1-800-243-4630

FR-57 and RBE-57 Cartridges have a 5 year shelf life.
EXP yyyy/mm

Always read and follow all User Instructions
Before Use: Inspection

• Inspect hood for damage (holes, cuts, tears)
  • Follow the detailed outlined in the BE-10 User Instructions and Inspection Guidance Document
• Check breathing tube for any punctures
• Ensure that cartridges have not expired and have not been opened
• Check body of the motor blower unit for cracks or general wear
• Ensure that NiMH battery has been charged or that there are enough hours remaining on the lithium battery
• Perform air flow check

See User Instructions and BE-10BR Inspection Guidance Document for additional information

Always read and follow all User Instructions
Air Flow Check

- Remove breathing tube from blower
- Attach cartridges and remove plugs
- Insert airflow indicator into blower and turn PAPR on
- Middle of ball in flow indicator must rise up to at least “6 CFM” location on flow meter for use with hood
- If PAPR does not pass the test, repeat inspection or see your supervisor. Do not use unit.
- Reattach breathing tube to blower
Donning with 3M™ Hoods

- Attach the unit to your waist and turn PAPR on
- Push the slotted end of the breathing tube into the connector in the rear of the hood until it snaps into place
- Pull the hood over your head and adjust it so the headband wraps around your head
- Tuck the inner shroud under your protective clothing and allow the outer shroud to hang outside your clothing
Accessories

• **Cartridge Shower Cover (RBE-SC):** Unique water-resistant cover protects device from water damage during use and enables product to be showered or wiped clean for decontamination. (Shower covers come with new RBE-10BR PAPR kit)

• **Training Cartridges (RBE-TRN):** Color-identifiable training cartridges for on-going, affordable training and clear differentiation from functioning canisters.
Accessories (continued)

- **Foam Insert for Butyl rubber hood (RBE-FIH):** Helps protect hood in storage for longer term response readiness.

- **Butyl Rubber Breathing Tube Cover:** This is included in the FR-57N10 and FR-57L10 assemblies for use as a protective cover over approved breathing tubes. This accessory is not sold separately.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smell or taste contaminants, irritation during use</strong></td>
<td>Misuse, improper assembly, or malfunction of equipment</td>
<td>Leave work area immediately and contact supervisor. Do not use PAPR until corrected.</td>
</tr>
</tbody>
</table>
| **Blower does not run**                      | • Battery is discharged  
• Faulty power switch  
• Faulty motor                                 | • Recharge or replace battery  
• Replace motor blower  
• Replace motor blower                          |
| **Low airflow**                              | • Battery needs charging  
• Filter in cartridge is loaded  
• PAPR blower malfunction  
• Breathing tube restricted                     | • Use fully charged battery  
• Replace cartridge  
• Switch to a different blower unit  
• Remove restriction                           |
Cleaning

- Follow the industrial hygiene / infection control practices established by your employer for the specific contaminants to which you have been exposed.
- For general cleaning, wipe the outside surfaces of the PAPR system with a solution of warm water and mild detergent. Do not clean with organic solvents. Do not soak the blower unit or battery in cleaning solutions.
- Wipe with a cloth dampened with clean warm water.
- If necessary wipe with a cloth dampened with a hypochlorite solution (1 oz. [30ml] household bleach in 2 gallons [7.5 L] of water).
- Other methods of cleaning, disinfection or sterilization have not been tested for compatibility with the PAPR, may damage the PAPR system, and therefore must not be used.
Storage

- Store components in a cool dry area that is free from contaminants and direct sunlight.
- Store in such a way as to protect the PAPR from physical damage.
- Hang or lay the hood flat for storage. Never fold or crush the visor. The RBE-FIH Hood Insert should be used to maintain the shape of the faceshield.
- Respirators assigned to an individual should be marked as such or stored in a specific location.
TR-630 (Li-ion) Battery Storage

Battery should be charged immediately and fully upon receipt.
Battery pack may remain connected to the charger for an extended period of time.
For long term storage, store battery pack off the charger at approximately 40% charge as shown by the battery pack charge indicator.
Battery should be fully recharged at least every 9-12 months.
Batteries reach their max capacity after the ~3rd charge. However, this is only a few %.
No special conditioning is needed as batteries are already at >95% capable capacity when new.
New batteries have a 12 month shelf life at recommended storage conditions.

Good-to-Know:
Versaflo™ Batteries lose ~2.5-4% per month in storage.

Good-to-Know:
Batteries are shipped 30-50% charged.
Suggested Monthly Maintenance

- According to OSHA (U.S. CFR 1910.134(h)(3)(i)(B)), respirators used for emergencies must be inspected monthly and before and after use.
- Visually inspect entire PAPR system (blower, breathing tube and hood or head cover) for damage.
- Check that cartridge caps and plugs are intact and that the shelf life printed on bottom of cartridge has not been exceeded.
- Perform a flow check. If flow is not adequate, make sure that battery has been properly charged. Replace cartridge, battery or charger as necessary.
## Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>0 to 120F (-18 to 48C), 32F (0C) lower limit with lithium battery</td>
</tr>
<tr>
<td>Battery pack</td>
<td>Rechargeable NiMH (up to 8 hrs of use per charge) or 12 hour lithium</td>
</tr>
<tr>
<td>Airflow range</td>
<td>&gt; 4 cfm (120 lpm) with 6000DIN</td>
</tr>
<tr>
<td></td>
<td>&gt; 6 cfm (170 lpm) with hoods</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 8 lbs (3.6 kg)</td>
</tr>
<tr>
<td></td>
<td>RRPAS 10 lbs (4.5 kg)</td>
</tr>
<tr>
<td>Natural rubber latex?</td>
<td>BE-10BR (yes), BE-10 (no), 6000DIN (no), S-403 (no)</td>
</tr>
<tr>
<td>Faceshield</td>
<td>Tychem® QC: clear acetate</td>
</tr>
<tr>
<td></td>
<td>Butyl Rubber: pressed vinyl</td>
</tr>
<tr>
<td></td>
<td>6000DIN: polycarbonate</td>
</tr>
<tr>
<td>S-403</td>
<td>________________</td>
</tr>
<tr>
<td>Sizing for S-403</td>
<td>Regular – head sizes 6 1/2 to 7 3/8</td>
</tr>
<tr>
<td></td>
<td>Large – head sizes 7 to 8</td>
</tr>
<tr>
<td>Photo</td>
<td>Item</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td><img src="item1.png" alt="Kit" /></td>
<td>Kit</td>
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<tr>
<td><img src="item2.png" alt="Kit" /></td>
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<td><img src="item3.png" alt="Kit" /></td>
<td>Kit</td>
</tr>
<tr>
<td><img src="item4.png" alt="Kit" /></td>
<td>Kit</td>
</tr>
</tbody>
</table>
3M™ Technical Service

USA: 1-800-243-4630

Web Site: www.3m.com/Workersafety