Georgia Tech

RESPIRATORY PROTECTION PROGRAM HANDBOOK

USER COMPANION

version 1.2
2025

RIGHT FIT

PROGRAM HANDBOOK

Environmental Health and Safety

Welcome to the Georgia Tech Respiratory Protection Program User Guide

The Purpose of This Handbook

The purpose of this handbook is to help you understand and follow the Right Fit Respiratory Protection Program at Georgia Tech. It's designed to keep everyone in our community safe and healthy by giving you clear guidelines on how to assess respiratory hazards, choose the right equipment, and maintain it properly.

By The GT Laboratory + Chemical Safety Team

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Welcome to the Right Fit Respiratory Protection Program at Georgia Tech!

This executive summary provides an overview of the program's key components and highlights its significance for your health and safety on campus.

Comprehensive Guide

The Right Fit Respiratory Protection Program handbook serves as your comprehensive guide to respiratory safety at Georgia Tech. It covers essential topics such as policy development, risk assessment, equipment selection, and medical evaluations, ensuring that you have the knowledge and tools to protect yourself and others from respiratory hazards.

Adherence to Standards

Our program is committed to adhering strictly to OSHA standards and regulations, guaranteeing that all practices and procedures meet or exceed safety requirements. By following the guidelines outlined in the handbook, you can rest assured that you're receiving the highest level of respiratory protection available.

Five Pillars of Excellence

Central to our program are the five pillars of excellence: Innovation, Education and Awareness, Compliance and Best Practices, Health and Wellness Integration, and Engagement and Feedback. These pillars reflect our commitment to continuous improvement and fostering a culture of health, well-being, and academic excellence across campus.

Your Role

As a program enrollee, you play a crucial role in ensuring the success of the Right Fit Respiratory Protection Program. By actively participating in training, fit testing, and maintenance activities, you contribute to creating a safer and healthier environment for yourself and the entire Georgia Tech community.

Conclusion

In conclusion, the Right Fit Respiratory Protection Program is dedicated to providing you with the resources and support you need to prioritize respiratory safety in your daily activities. By embracing the principles outlined in this handbook and actively engaging with the program, you're taking an important step towards a safer, healthier future for all.

Welcome to the Right Fit Respiratory Protection Program Handbook!

Dear Georgia Tech Community,

Welcome to the Right Fit Respiratory Protection Program handbook! Whether you're a student, faculty member, or staff member at Georgia Tech, your health and safety are our top priorities. This handbook serves as your guide to understanding and implementing respiratory protection practices on campus.

About the Program

The Right Fit Respiratory Protection Program is designed to ensure the highest standards of respiratory safety for all members of the Georgia Tech community. By equipping you with the knowledge and tools needed to identify and mitigate respiratory hazards, we aim to create a safer and healthier campus environment for everyone.

What You'll Find Inside

In this handbook, you'll find comprehensive information on a range of topics related to respiratory protection, including:

- Understanding Respiratory Hazards: Learn how to identify common respiratory hazards in your environment and the importance of protecting yourself against them.
- Selecting the Right Equipment: Discover the different types of respiratory protection equipment available and how to choose the right fit for your needs.
- Training and Education: Access training modules designed to educate you on the proper use and maintenance of respiratory protection equipment.
- Fit Testing and Maintenance: Understand the importance of fit testing and how to properly maintain your respiratory protection equipment for optimal effectiveness.
- Compliance and Regulations: Learn about OSHA standards and regulations governing respiratory protection practices and how to ensure compliance.

Your Role in Respiratory Safety

As a member of the Georgia Tech community, you play a vital role in ensuring the success of the Right Fit Respiratory Protection Program. By familiarizing yourself with the guidelines outlined in this handbook and actively participating in training and fit testing activities, you contribute to creating a safer and healthier campus environment for yourself and others.

Conclusion

Thank you for taking the time to read through the Right Fit Respiratory Protection Program handbook. By prioritizing respiratory safety in your daily activities, you're helping to build a stronger and more resilient Georgia Tech community.

MIssion, Vission, & Values

At Georgia Tech, we proudly introduce the Right Fit Program, an embodiment of our unwavering commitment to setting new standards in respiratory protection within the academic landscape. Rooted in our core values of integrity, innovation, and compassion, the Right Fit Program is designed to safeguard the well-being of our students, faculty, and staff, ensuring a safe and conducive learning environment for all.

Our Mission

Our mission is clear and compelling: to uphold the highest level of respiratory protection for every member of our Georgia Tech community. We recognize the importance of health and safety in achieving academic and professional excellence. Thus, the Right Fit Program is meticulously crafted to provide comprehensive respiratory protection, allowing our community to focus on what truly matters learning, growth, and achievement. With a steadfast dedication to service, integrity, and passion, we are committed to exhaustive efforts to ensure that our program remains the benchmark for respiratory safety in higher education.

Our Vision

Our vision is to revolutionize the perception and implementation of respiratory protection in academic settings nationwide. Through the Right Fit Program, Georgia Tech aims to lead by example, demonstrating that it is possible to combine cutting-edge technology, expert guidance, and a values-based approach to achieve unparalleled standards of safety and excellence. We envision a future where every college and university considers the Right Fit Program the gold standard, inspiring a nationwide elevation of respiratory protection protocols.

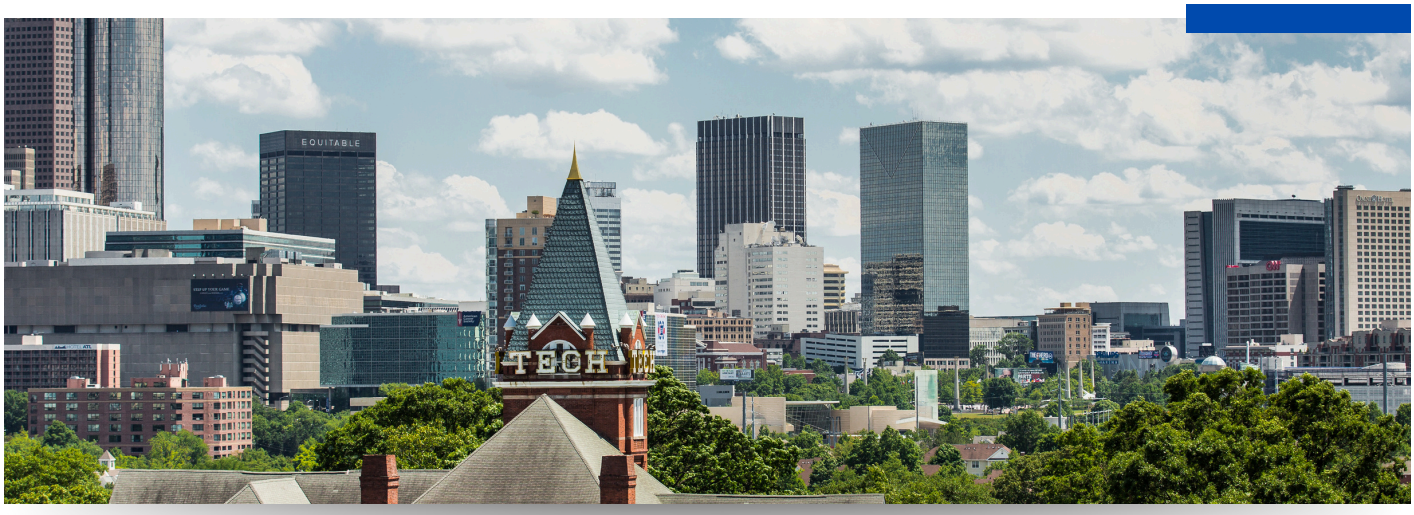
Core Values + Approach

The essence of the Right Fit Program lies in its values-based approach, where every action and decision is guided by integrity, respect, and empathy. Effective respiratory protection should not compromise the principles that define us. Instead, it should reflect our collective commitment to caring for and protecting each other. Our program is built on a foundation of innovation, continuously exploring new technologies and methodologies to enhance respiratory safety. We engage with leading experts, leverage state-of-the-art resources, and foster a culture of continuous learning and improvement.

Our Commitment

The Right Fit Program is more than just a set of guidelines; it is a promise to our community. A promise of a safer, healthier future where every individual is equipped with the knowledge, tools, and support needed to navigate respiratory hazards confidently. We are dedicated to maintaining an open dialogue, ensuring that the voices and concerns of our community are heard and addressed. Our team is always on hand to provide guidance, support, and education, making respiratory safety an accessible and integral part of our daily lives.

Join us on this transformative journey with the Right Fit Program. Together, we will not only meet today's challenges but also pave the way for a safer, more protected tomorrow. At Georgia Tech, we don't just aspire to meet standards; we aim to set them, embodying excellence in every breath we take.



Goals and Objectives of the Right Fit Program

The Right Fit Program at Georgia Tech is designed with specific goals and objectives to ensure the highest respiratory protection and safety standards for our community. Our comprehensive approach focuses on education, prevention, innovation, and community engagement to achieve these aims.

To Enhance Respiratory Safety

To significantly reduce the risks associated with respiratory hazards by implementing best practices in respiratory protection, ensuring all community members are equipped with the knowledge and tools necessary for their safety.

To Promote a Culture of Health and Safety

To foster a campus-wide culture in which health and safety are prioritized and every individual is encouraged to take proactive steps to protect themselves and others.

To Achieve Excellence in Respiratory Protection

To establish Georgia Tech's Right Fit Program as a model of excellence and a benchmark for respiratory protection in academic institutions nationwide.

Special Objectives

Comprehensive Education and Training

To provide accessible, high-quality education and training programs for students, faculty, and staff, ensuring they are well informed about the types and proper use of respiratory protection equipment and the risks associated with inadequate respiratory protection.

Innovation and Research

To stay at the forefront of technological and methodological advancements in respiratory protection by actively engaging in and supporting research initiatives, adopting innovative solutions, and continuously improving our program based on the latest findings and best practices.

Community Engagement and Participation

To actively involve the Georgia Tech community in developing, implementing, and continuously improving the Right Fit Program, ensuring it meets the needs and addresses the concerns of all its members.

Health Assessments and Personalized Protection

To provide individual health assessments related to respiratory protection, ensuring that every community member receives personalized recommendations and equipment that offer the best fit and protection.

Emergency Preparedness and Response

To enhance the community's preparedness for respiratory emergencies through regular drills, updated response plans, and clear communication channels, ensuring swift and effective action when needed.

Regulatory Compliance and Best Practices

To ensure full compliance with all relevant local, state, and federal regulations regarding respiratory protection while striving to exceed these standards by adopting and promoting best practices within our program.

Monitoring and Continuous Improvement

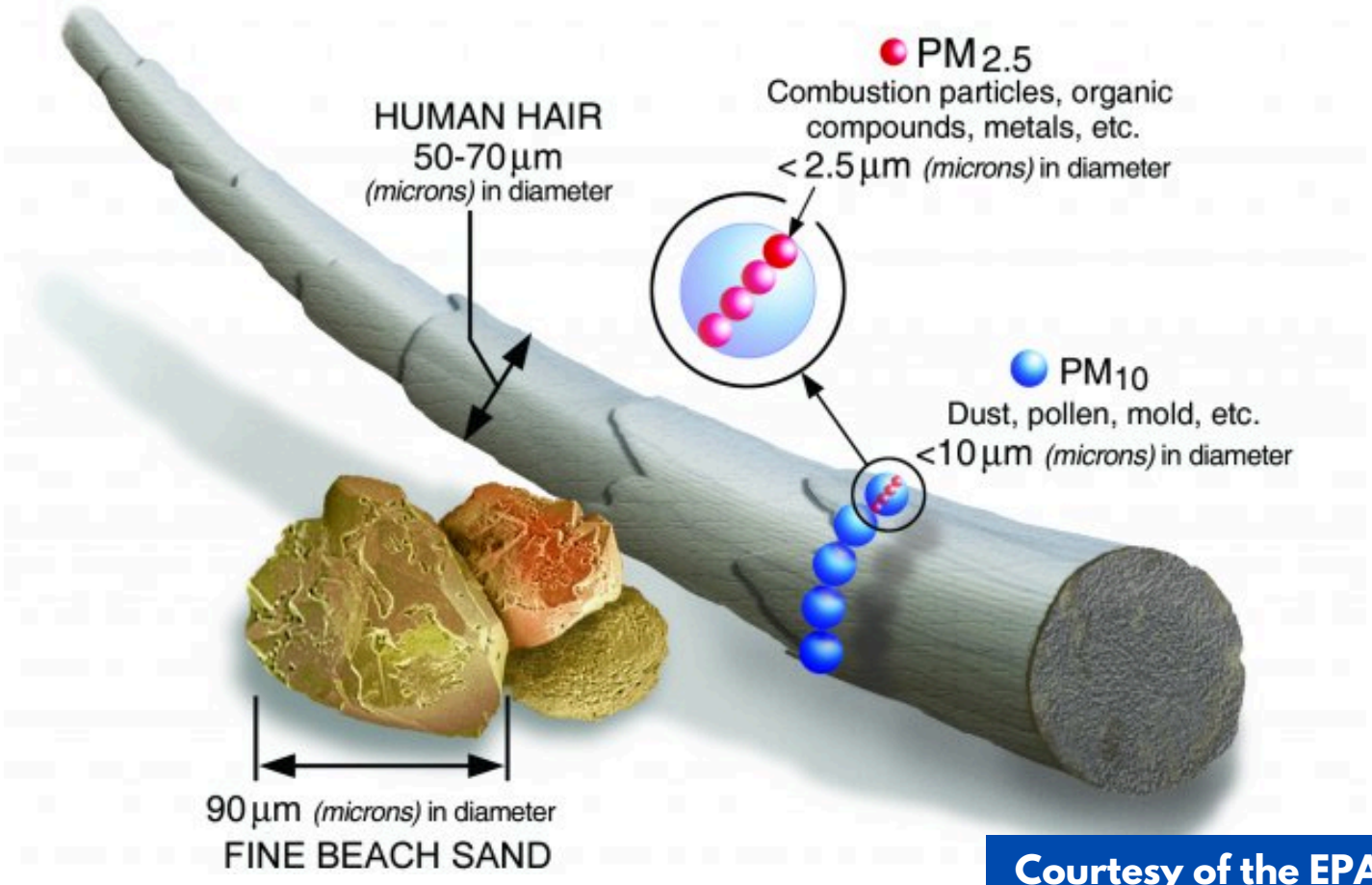
To establish robust mechanisms for monitoring the Right Fit Program's effectiveness, incorporating community feedback, and making data-driven decisions for continuous improvement.

Through the achievement of these goals and objectives, the Right Fit Program aims to protect and enhance the well-being of the Georgia Tech community, making our campus a safer place for everyone to learn, work, and thrive. Our commitment to excellence, innovation, and a values-based approach sets us apart, driving us toward a future where respiratory health is a given, not a concern.

Importance of Respiratory Protection

Respiratory protection is critical to workplace safety, particularly in environments where employees are exposed to harmful airborne contaminants. These contaminants can include dust, fumes, gases, vapors, and infectious agents, which pose significant health risks ranging from respiratory irritation to chronic illnesses and life-threatening diseases. The significance of respiratory protection can be understood through several key aspects

- **Health + Safety**
- **Regulaatory compliance**
- **Productivity + Morale**
- **Economic Implications**
- **Social Responsibility**



Courtesy of the EPA

Health and Safety

- Prevention of Occupational Illnesses:
  - Proper respiratory protection prevents the inhalation of hazardous substances, reducing the risk of occupational illnesses such as lung disease, cancer, and systemic toxicity.

- Immediate Health Protection:
  - In emergency situations involving sudden releases of toxic substances, respiratory protection provides immediate defense, allowing workers to evacuate or manage the situation safely.

Regulatory Compliance

- Compliance with Occupational Safety and Health Administration (OSHA) standards and other regulatory requirements is essential for legal and ethical operation. These standards ensure that employers provide a safe working environment; adherence to respiratory protection guidelines is key.

Productivity and Morale

- Minimizing Absenteeism:
  - By protecting employees from respiratory hazards, organizations can reduce absenteeism due to illness, thereby maintaining productivity and operational efficiency.

- Boosting Employee Morale:
  - Demonstrating a commitment to employee health and safety enhances morale and trust. Workers are more likely to be engaged and satisfied in their roles when they prioritize their well-being.

Economic Implications

- Cost Avoidance:
  - Investing in effective respiratory protection can result in significant cost savings by avoiding expenses related to healthcare, compensation, and potential litigation arising from occupational illnesses.

- Sustainability of Operations:
  - Maintaining a healthy workforce is essential for any organization's sustainable operation. Respiratory protection contributes to a company's long-term viability by protecting its most valuable asset, its employees.

Social Responsibility

- Community Health:
  - Certain industries can pose risks to employees and surrounding communities. Implementing strict respiratory protection measures reflects an organization's commitment to social responsibility and community health.

- Setting Industry Standards:
  - Organizations prioritizing respiratory protection help set high industry standards, encouraging others to follow suit and improve health and safety practices.

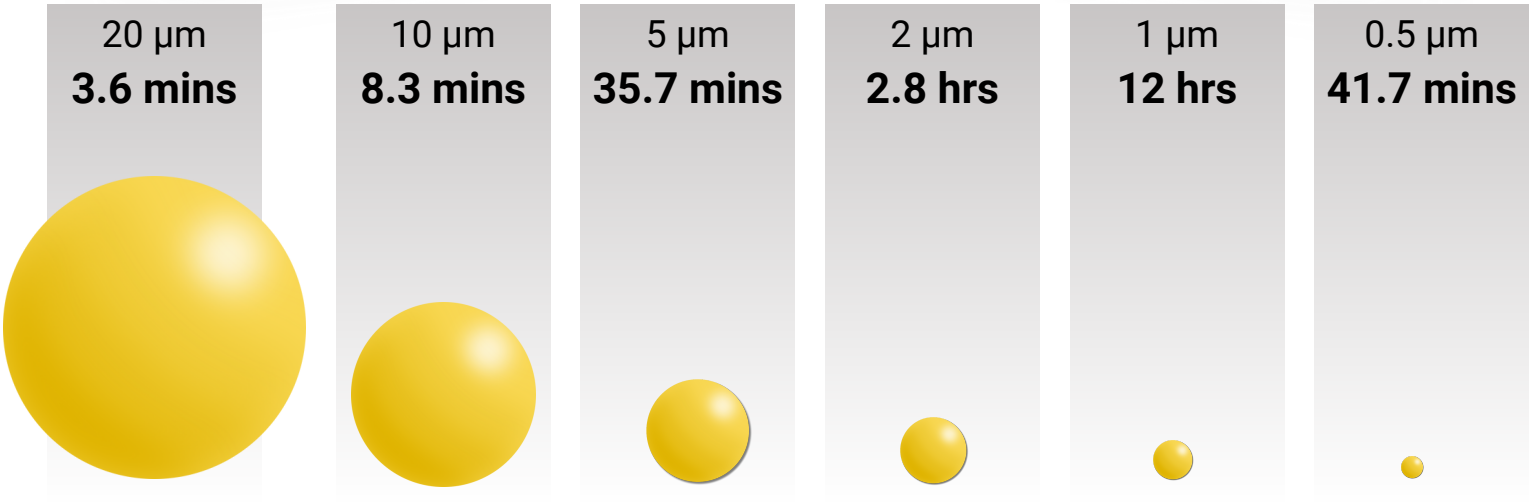
In conclusion, respiratory protection's importance transcends individual health and impacts legal, economic, and social dimensions. It is a fundamental aspect of a comprehensive health and safety program, ensuring that employees are safeguarded against respiratory hazards and that organizations maintain ethical, productive, and sustainable operations.

How Long Can Particles Stay in the Air

It is important to exercise caution and avoid removing a respirator too soon after engaging in particle-generating activities such as spraying, cutting, grinding, or welding. Failure to do so can put users at significant risk of inhaling harmful particles or fumes that may cause respiratory problems or other health issues. It is recommended to wait until the area is well-ventilated and any airborne particles have settled before removing the respirator to ensure maximum safety.

A dust particule's size and the stillness of the air can determin how long it may stay in the air.

1000 µm (micron) = 1 millimetre



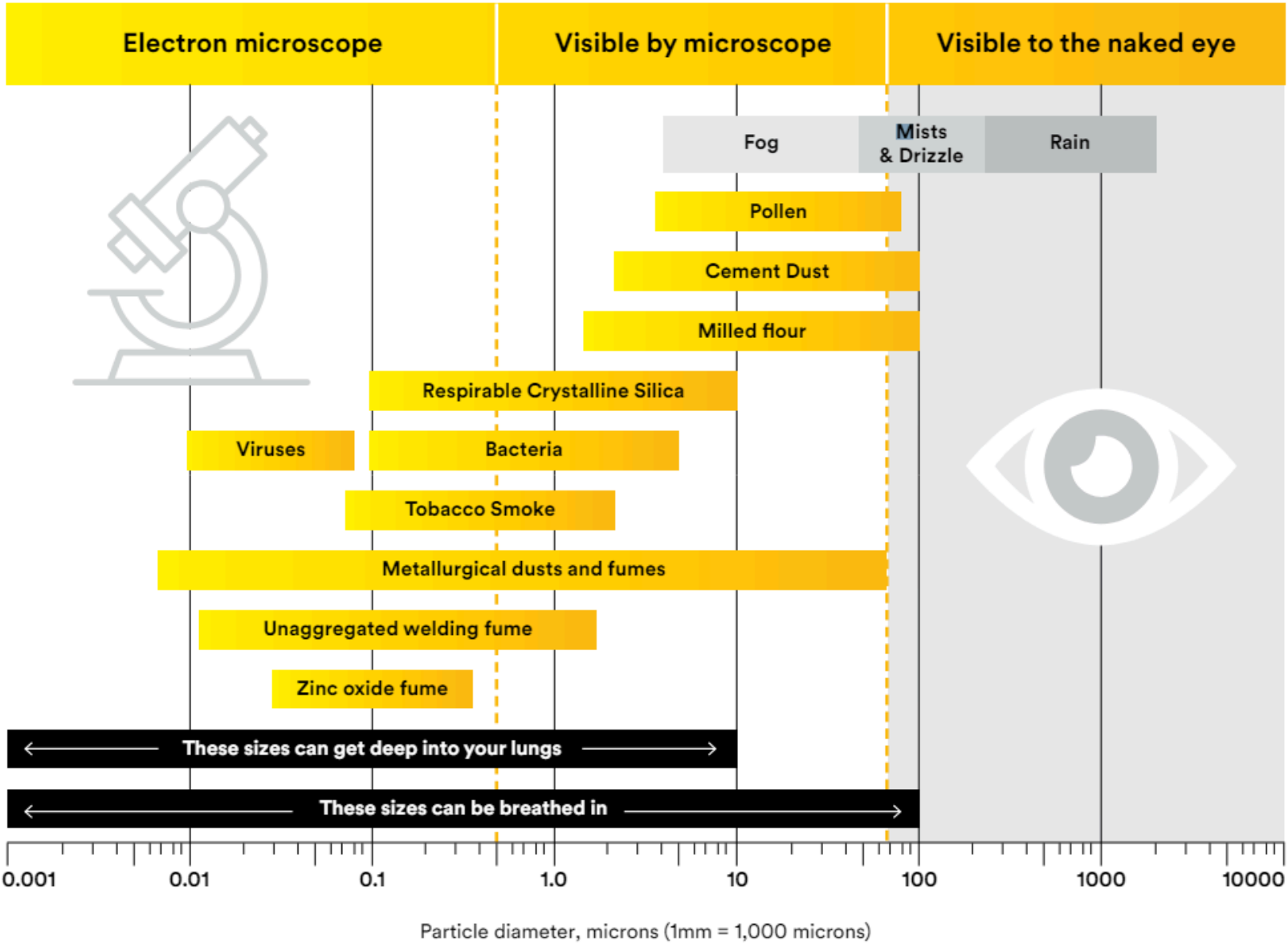
Estimated settling rates for different sized mist droplets...from a height of 1.5 meters in still air

If the air is turbulent these droplets can remain airborne far longer. These small droplets become invisible as they disperse in the air. Dry particles like wood dust and cement dust of similar sizes behave in a very similar way.

^ Source: HSE data extracted from "Air pollution its origin & control" by Kenneth Wark & Cecil F Warner

Examples of Particulate Sizes

- Generally, particles of 100 microns or less can all be breathed in; they are called inhalable particle sizes.
- Particles of 10 microns or less, called respirable particles, can get deep into the airways of our lungs and can reach the delicate gas exchange region and may cause serious damage.



Courtesy of 3M

Policy Development

Statement of Policy

The Right Fit Program at Georgia Tech is committed to maintaining a safe and healthy environment by providing and enforcing the highest respiratory protection standards for all community members. This policy underscores our dedication to preventing respiratory hazards and ensuring the well-being of students, faculty, and staff through comprehensive education, training, and access to appropriate respiratory protection equipment.

Scope and Applicability

This policy applies universally across the Georgia Tech community, encompassing all students, faculty, and staff, regardless of their role or department. It includes individuals working in laboratories, maintenance, construction, and any other areas identified as having potential respiratory hazards. The program also extends to visitors and contractors on campus, ensuring a uniformly safe environment within all Georgia Tech-operated facilities.

Standards + Regulation Compliance

The program rigorously adheres to the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard (29 CFR 1910.134), along with any other federal, state, and local regulations applicable to respiratory safety. Georgia Tech is committed to meeting these legal requirements and exceeding them wherever possible to ensure the highest level of safety and protection for our community.

For further details on the specific standards and regulations, refer to the OSHA guidelines and Georgia Tech's official safety protocols.

Overview of Program Policies and Their importance

Policy Adherence: The program requires strict adherence to all policies outlined in this handbook. By following these guidelines, you can effectively mitigate respiratory hazards and protect yourself and others from potential health risks.

Risk Mitigation: Program policies are designed to help identify and mitigate respiratory hazards in various campus environments. By understanding and adhering to these policies, you can minimize your exposure to harmful substances and ensure a safer working and learning environment.

Regulatory Compliance: The Right Fit Respiratory Protection Program is committed to compliance with all relevant regulations and standards, including those set forth by the Occupational Safety and Health Administration (OSHA). By following program policies, you help ensure that Georgia Tech remains in compliance with these regulations.

Personal Responsibility: While Georgia Tech provides the necessary resources and support for respiratory protection, it's ultimately your responsibility to adhere to program policies and use respiratory protection equipment appropriately. By doing so, you play an active role in safeguarding your own health and safety.

Continuous Improvement: Program policies are subject to review and revision as needed to reflect changes in regulations, technology, and best practices. Your feedback and adherence to these policies are vital for the ongoing improvement of the program and its effectiveness in protecting the Georgia Tech community.

In summary, understanding and adhering to program policies are essential for ensuring your safety and well-being in environments where respiratory hazards may be present. By following these policies, you contribute to creating a safer and healthier campus environment for yourself and others.

Breathing safely is not just a necessity; it's a right. Our commitment to respiratory protection ensures that every breath taken on campus is a step towards a healthier future.

Written Program

General. The Occupational Safety and Health Administration (OSHA) General Industry standard for respiratory protection 29 CFR 1910.134 requires that an employer establish a written respiratory protection program. The following procedures are based on the requirements established by OSHA.

Policy. Georgia Tech's policy is to provide its students, faculty, and staff with a safe and healthful work environment. The guidelines in this program are designed to help reduce community exposure to occupational air contaminants and oxygen deficiency.

Responsibilities

According to OSHA, every year, more than 5,000 workers are killed on the job (a rate of 14 per day), and more than 3.6 million suffer a serious job-related injury or illness

The primary objective is to prevent excessive exposure to these contaminants. This is accomplished as far as feasible by accepted engineering and work practice control measures. When effective engineering controls are not feasible, or while they are being implemented or evaluated, respiratory protection may be required to achieve this goal. In these situations, respiratory protection is provided at no cost to students, faculty, or staff.

Management. It is the Environmental Health and Safety Department at Georgia Tech's Laboratory and Chemical Safety Team's responsibility to determine what specific applications require respiratory protective equipment. EHS must also provide proper respiratory protective equipment to meet the needs of each specific application. Enrollees must be provided with adequate training and instructions on all equipment

Supervisory. Supervisors of each area are responsible for ensuring that all personnel under their control know the respiratory protection requirements for their work areas. They are also responsible for ensuring that their subordinates comply with all facets of this respiratory protection program, including respirator inspection and maintenance. They are responsible for implementing disciplinary procedures for Georgia Tech's Respiratory Protection Program enrollees who do not comply with respiratory program requirements.

Enrollees. The enrollee of Georgia Tech's Respiratory Protection Program is responsible for being aware of the respiratory protection requirements for their work areas (as explained by EHS). Enrollees of Georgia Tech's Respiratory Protection Program are also responsible for wearing the appropriate respiratory protective equipment according to proper instructions and for maintaining the equipment in a clean and operable condition.

Program Admin

The following individual has total and complete responsibility for the administration of the respiratory protection program:

Elizabeth Marie Henry, MS, ASP
Laboratory & Chemical Safety Specialist
Environmental Health & Safety

This individual has the authority to act on any and all matters relating to the operation and administration of the respiratory protection program. All employees, operating departments, and service departments will fully cooperate. This person is referred to as the Respiratory Protection Program Administrator in this program. This individual is responsible for monitoring or conducting an exposure assessment of the respiratory hazard, developing worksite-specific procedures for this program, maintaining records, and conducting program evaluations.

Program Evaluation. The Program Administrator will also review and evaluate the entire program at least every 12 months.

Program Requirements

Medical Evaluation. Every enrollee who is being considered for inclusion in the Respiratory Protection Program must participate in a medical evaluation. The enrollee's ability to wear a respirator while working is initially determined before fit testing. Additional evaluations are made when there is a change in workplace conditions or information indicating a need for re-evaluation.

The program administrator will obtain from the Physician or other licensed healthcare professional or PLHCP a written medical determination regarding
the employee's ability to use the respirator. If the PLHCP deems it necessary, the employee will receive a follow-up examination. This examination is provided at no cost to the enrollee. The medical evaluation aims to ensure that the enrollee is physically and psychologically able to perform the assigned work while wearing respiratory protective equipment.

If the PLHCP denies approval, the enrollee cannot participate in the Respiratory Protection Program. A medical evaluation must be completed
before respirator training, fit testing of tight-fitting respirators, and use.

Copies of the medical evaluation and questionnaire will be kept as a medical record in accordance with 29 CFR 1910.1020. A copy of the written medical
determination will be kept in the enrollee's file.

Risk Assessment. Exposure assessment will be done to ensure proper respirator selection. To determine the exposure level, air samples of the workplace representative of the work period, exposure assessment based on analogous processes, or professional judgment will be used. Personal sampling equipment may be used in
accordance with accepted industrial hygiene standards to sample each work area. The results of these samples will pinpoint areas where respiratory
protection is required.

The exposure assessment will be performed prior to the task requiring respiratory protection. Periodically
thereafter, as required by OSHA substance specific standards or at least every 12 months, a review of the exposure assessment will be made to determine
if respiratory protection is still required.

Program Requirements continued...

Respirator selections will be reviewed to ensure their continued suitability if respiratory protection is still necessary.

Note: The program administrator can establish more frequent evaluations/ assessments.

Respirator Selection. Respirators are selected and approved for use by management. The selection is based on the physical and chemical properties of the air contaminants and the concentration level likely to be encountered by the employee.

The Respiratory Protection Program Administrator will make a respirator available immediately to each employee who is assigned to a job that requires respiratory protection.

Replacement respirators/cartridges and filters will be made available as required. When chemical cartridge respirators are used, the program administrator will establish a cartridge change schedule based on objective information or data.

Use of Respirators. All tight-fitting respirators (both negative and positive pressure) shall not be used with beards or other facial hair or any other condition
that prevents direct contact between the face and the edge of the respirator or interferes with valve function.

Fit testing ensures the expected level of protection is provided by minimizing the total amount of contaminant leakage into the respirator.

Enrollees will be required to leave the contaminated area:

- Upon malfunction of the respirator.
- Upon detection of leakage of contaminant into the respirator.
- If increased breathing resistance of the respirator is noted.
- If severe discomfort in wearing the respirator is detected.
- Upon illness of the respirator wearer, the sensation of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, and chills.
- To wash face to prevent skin irritation.
- To change filter/cartridge elements or replace respirators whenever they detect the warning properties of the contaminant or increased breathing resistance or in accordance with the cartridge change schedule.

Training + Fit Testing

Training. Enrollees assigned to jobs and endeavors requiring respirators will be instructed by their supervisor relative to their responsibilities in the respiratory protection program. They will also be instructed in the need, use, limitations, and care of their respirator. Retraining is given at least every 12 months after initial training.

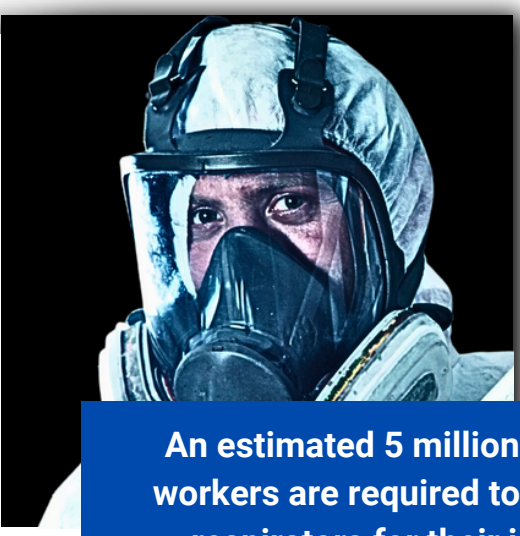
Fit Testing. Enrollees will be properly fitted and tested for a face seal before using the respirator in a contaminated area. Quantitative fit testing will be the method of fit testing.

Fit testing will be done initially upon the enrollee's assignment to an area where tight-fitting respirators are required. Fit testing will be repeated at least every 12 months thereafter. All tight-fitting respirators (negative and positive pressure) will be fit tested. Positive pressure tight-fitting respirators will be fit-tested in the negative pressure mode.

Fit testing will not be done on enrollees with facial hair that passes between the respirator seal and the face or interferes with valve function. Such facial hair includes stubble, beards, and long sideburns.

During fit testing, enrollees will be shown the proper maintenance and care specific to their type of respirator.

Note: If it is determined that an individual cannot obtain an adequate fit with any tight-fitting respirator, a loose-fitting powered air purifying or supplied air respirator may be required instead.



An estimated 5 million U.S. workers are required to wear respirators for their job.

Care + Maintenance

Respirators must be properly maintained to retain their original effectiveness. The maintenance program will consist of periodic inspection, repair, cleaning, and proper storage.

Inspection. The wearer of a respirator will inspect it daily whenever it is in use. The program administrator or members of EHS will periodically spot-check respirators for fit, usage, and condition. The use of defective respirators is not permitted. If a defective respirator is found during inspection, it must be returned to the program administrator.

Repair. During cleaning and maintenance, respirators that do not pass inspection will be removed from service and will be discarded or repaired. Repair of the respirator must be done with parts designed for the respirator in accordance with the manufacturer's instructions before reuse. No attempt will be made to replace components or make
adjustments, modifications, or repairs beyond the manufacturer's recommendations.

Cleaning. Respirators not discarded after one shift use, except filtering facepiece type, will be cleaned on a daily basis (or after each use if not used daily), according to the manufacturer's instructions, by the assigned employee or other person designated by the Respiratory Protection Program Administrator.

Storage. Respirators not discarded after one shift use will be stored in a location where they are protected from sunlight, dust, heat, cold, moisture, and damaging chemicals. They shall be stored in a manner to prevent deformation of the facepiece and exhalation valve.

Whenever feasible, respirators not discarded after one shift use will be marked and stored in such a manner to assure that they will be worn only by the
assigned employee. If use by more than one employee is required, the respirator will be cleaned between uses.

Identifying and Evaluating Respiratory Hazards

In line with Georgia Tech's commitment to ensuring a safe and healthy campus environment, our Respiratory Hazard Assessment is a critical procedure designed to meticulously evaluate potential respiratory risks associated with various campus activities. By analyzing tasks, identifying airborne contaminants, and assessing exposure levels, we ensure the selection of suitable respiratory protection, thereby upholding our high standards of safety and regulatory compliance. Below we share some of the parameters that is evaluated during this process.

Exposure to Chemicals

- Organic Vapors (Benzene, Toluene, MEK, Acetone, Xylene, Paint Thinners, etc)
- Acid Gases (Hydrogen Chloride, Hydrogen Sulphide, etc.)
- Ammonia
- Formaldehyde/Formalin

Exposure to Dust, Mists, Fumes, or Particulates

- Cotton Dusts
- Grain Dust
- Animal Dust
- Wood Dust
- Biological Hazards
- Welding Fumes
- Asphalt Fumes
- Other Fumes
- Nanoparticles

Explanation of Respiratory Hazards and Their Recognition

Respiratory hazards are substances or conditions in the environment that have the potential to harm your respiratory system when inhaled. It's crucial to recognize these hazards and understand their potential impact on your health and well-being. Below, we provide an overview of common respiratory hazards and how to recognize them:

Chemical Hazards

- Chemical substances such as gases, vapors, dusts, and fumes can pose respiratory hazards in various work and academic settings. These hazards may arise from laboratory experiments, industrial processes, construction activities, or other sources. Recognizing chemical hazards involves identifying the types of chemicals present, understanding their properties and potential health effects, and taking appropriate precautions to minimize exposure.

Biological Hazards

- Biological agents such as bacteria, viruses, fungi, and allergens can also pose respiratory hazards. These hazards may be present in healthcare settings, research laboratories, agricultural environments, or other areas where there is potential for exposure to infectious or allergenic materials. Recognizing biological hazards involves identifying sources of contamination, understanding transmission routes, and implementing measures to prevent exposure and spread of infectious agents.

Physical Hazards

- Physical agents such as airborne particulates, smoke, and extreme temperatures can also affect respiratory health. These hazards may arise from environmental factors such as wildfires, industrial accidents, or outdoor air pollution. Recognizing physical hazards involves monitoring air quality, assessing environmental conditions, and taking precautions to reduce exposure to harmful particles or conditions.

Mechanical Hazards

- Mechanical hazards, such as airborne debris or abrasive materials, can also pose respiratory risks in certain work environments. These hazards may be encountered in construction, manufacturing, or maintenance activities where there is potential for mechanical injury or irritation to the respiratory system. Recognizing mechanical hazards involves identifying sources of debris or particles, assessing potential risks, and using appropriate respiratory protection equipment to mitigate exposure.

Combination Hazards

- In some cases, respiratory hazards may involve a combination of chemical, biological, physical, or mechanical agents. For example, certain industrial processes or environmental conditions may generate multiple types of respiratory hazards simultaneously. Recognizing combination hazards requires a thorough understanding of the specific risks present and implementing comprehensive risk management strategies to address them effectively.

In summary, recognizing respiratory hazards involves identifying potential sources of exposure, understanding the nature of the hazards present, and implementing appropriate control measures to protect your respiratory health. By being aware of these hazards and taking proactive steps to mitigate risks, you can minimize the likelihood of respiratory-related health problems and maintain a safe and healthy environment for yourself and others.

Selection of Appropriate Respiratory Protection Equipment

Based on the hazard assessment, the most suitable respiratory protection equipment is selected, ensuring it meets the specific needs of the environment and the individual's comfort and safety requirements.

The process of selecting the appropriate respiratory protection equipment is a critical step that follows a comprehensive hazard assessment. This selection is guided by a detailed understanding of the specific environmental hazards and the unique needs of the individuals within that environment. The chosen equipment must provide adequate protection against identified contaminants, such as particulates, gases, vapors, or a combination thereof, while also considering factors such as the level of hazard, duration of exposure, and the physical demands of the task at hand.

Types of Respiratory Protection Devices

Respiratory protection devices are essential tools designed to safeguard individuals from inhaling hazardous substances, particulates, or infectious agents present in the air. These devices vary in design, level of protection, and suitability for different environments. Here's a detailed section on various types of respiratory protection devices.

N95 RESPIRATORS:

N95 respirators are tight-fitting facepiece respirators that filter out at least 95% of airborne particles, including large and small particles. These respirators are commonly used in healthcare settings and industrial workplaces where exposure to airborne contaminants such as dust, smoke, and infectious agents is a concern. N95 respirators are disposable and should be discarded after each use or when damaged or soiled. They provide moderate protection against airborne particles but do not protect against gases, vapors, or oxygen-deficient atmospheres.

HALF-FACE RESPIRATORS:

Half-face respirators cover the nose and mouth and use filters or cartridges to protect against airborne contaminants. They are commonly used in construction, painting, agriculture, and other industries where exposure to dust, fumes, and other respiratory hazards is common. Half-face respirators are available in various designs, including models with replaceable filters or cartridges for different hazards. They offer moderate protection and are often used with other personal protective equipment (PPE), such as goggles and ear protection.

From the simplicity of N95s to the comprehensive coverage of full-face respirators, each type holds the key to unlocking a safer breath in its designated realm.

FULL-FACE RESPIRATORS:

Full-face respirators provide complete facial coverage, including the eyes, nose, and mouth, offering enhanced protection compared to half-face respirators. They are used in environments where there is a risk of exposure to hazardous gases, vapors, or particulates that could irritate or harm the eyes and skin. Full-face respirators feature a transparent visor or lens to maintain visibility while providing respiratory protection. These respirators are commonly used in chemical manufacturing, pharmaceuticals, and emergency response teams dealing with hazardous materials.

POWERED AIR-PURIFYING RESPIRATORS (PAPRS):

PAPRs are respiratory protection devices that use a battery-powered blower to draw air through filters or cartridges, supplying clean air to the wearer. They offer a higher level of protection than standard respirators and are suitable for environments where there is a high concentration of airborne contaminants or prolonged exposure to hazardous substances. These respirators are also utilized in industries such as pharmaceutical manufacturing, asbestos abatement, and painting, where respiratory hazards are prevalent.

Maintenance, Storage, and Care of Equipment

Proper maintenance, storage, and care of respiratory protection equipment are vital aspects of ensuring its effectiveness and longevity. Neglecting these factors can compromise the integrity of the equipment, leading to potential health and safety risks for the wearer.

By adhering to these maintenance, storage, and care guidelines, organizations can ensure that their respiratory protection equipment remains in optimal condition and provides reliable protection to workers against respiratory hazards. Regular inspections, cleaning, proper storage, and prompt replacement of worn-out components are essential practices to maintain the equipment's integrity and effectiveness over time.

REGULAR INSPECTION:

Conduct regular inspections of all respiratory protection equipment before each use. Check for signs of damage, wear, or deterioration, including cracks, tears, broken straps, or malfunctioning valves. Ensure that all components, such as filters, cartridges, seals, and hoses, are in good condition and properly attached.

STORAGE:

Store respiratory protection equipment in a clean, dry, and well-ventilated area away from direct sunlight, extreme temperatures, moisture, dust, and chemicals. Ensure that the storage area is free from contaminants that could compromise the integrity of the equipment. Store respirators in their original packaging or in a designated storage container to protect them from damage and contamination.

REPLACEMENT AND REPAIR:

Disposable respiratory protection equipment, such as N95 respirators and filters, should be replaced as recommended by the manufacturer or when they become damaged, soiled, or difficult to breathe through. Worn-out or damaged parts, such as straps, valves, and seals, should be replaced promptly to maintain the equipment's effectiveness. Seek professional repair services for complex repairs or issues beyond simple maintenance.

CLEANING AND SANITIZATION:

1. Clean all reusable equipment after each use according to manufacturer instructions.
2. Use mild soap and warm water to wash the surfaces thoroughly, paying close attention to areas that come into contact with the face.
3. Rinse the equipment thoroughly and allow it to air dry completely before storage.
4. If applicable, sanitize the equipment using appropriate disinfectants to kill any harmful microorganisms.

PROPER HANDLING:

Handle respiratory protection equipment with care to avoid causing damage or deformation. Avoid dropping, crushing, or bending the equipment, as this can affect its seal and functionality. Follow proper donning and doffing procedures to prevent unnecessary wear and tear on the equipment.

TRAINING AND EDUCATION:

Provide training to personnel on the proper maintenance, storage, and care of respiratory protection equipment. Educate users on the importance of following manufacturer instructions and guidelines for maintenance and care. Encourage users to report any issues or concerns regarding the condition of their respiratory protection equipment promptly.

Key Considerations for Selection

Type of Hazard

The nature of the airborne hazard (e.g., particulate, gas, vapor) dictates the type of respirator required. Particulate respirators are chosen for solid or liquid particles, while gas/vapor respirators are selected for hazardous gases and vapors.

Protection Factor

The equipment's Assigned Protection Factor (APF) must be sufficient to reduce the exposure to below the Occupational Exposure Limit (OEL) for the specific contaminant.

Fit and Comfort

The respirator must fit the wearer properly to ensure an effective seal. Comfort is also essential, especially for equipment that will be worn for extended periods, as it affects compliance and, consequently, the level of protection.

Work Conditions

The physical conditions and the nature of the work being performed can influence the selection. For instance, heavy physical labor or hot environments may necessitate respirators that impose minimal breathing resistance and are less burdensome.

Ease of Communication

In settings where communication is crucial, respirators that facilitate easier speaking and listening may be preferred.

Compatibility with Other PPE

The selected respirator must be compatible with other personal protective equipment (PPE) used, such as safety goggles, helmets, or hearing protection.

Maintenance and Hygiene

Consideration should be given to the ease of cleaning, disinfecting, and maintaining the respirator, as well as the availability of replaceable parts like filters and cartridges.

Training and Use

The complexity of donning, doffing, and maintaining the respirator should match the training level and expertise of the user.

Regulatory Compliance

All selected respiratory protection equipment must be NIOSH-approved and comply with applicable regulations and standards.

By carefully considering these factors, program administrators can ensure that the selected respiratory protection equipment not only provides the necessary level of safety but also supports the well-being and operational efficiency of the individuals it is designed to protect.

Initial and Annual Training Requirements

Training is crucial to any respiratory protection program, ensuring that users understand how to properly select, use, maintain, and store respiratory protection equipment. Both initial and annual training sessions are essential to reinforce knowledge, address any updates or changes in procedures, and maintain compliance with regulatory standards. Below are detailed guidelines for initial and annual training requirements:

Initial Training

Introduction to Respiratory Hazards:

- Provide an overview of respiratory hazards present in the workplace, including dust, chemicals, biological agents, and infectious diseases.
- Explain the potential health effects of exposure to respiratory hazards and the importance of respiratory protection.

Types of Respiratory Protection Equipment:

- Describe the types of respiratory protection equipment available, including N95 respirators, half-face and full-face respirators, and powered air-purifying respirators (PAPRs).
- Explain the appropriate uses and limitations of each type of respirator based on workplace hazards and individual job tasks.

Respirator Selection and Fit Testing:

- Review the process for selecting the appropriate respirator based on the workplace's specific hazards and individual user characteristics.
- Explain the importance of fit testing to ensure a proper seal between the respirator and the wearer's face.
- Demonstrate how to perform a user seal check before entering a hazardous environment.

Proper Use and Maintenance:

- Provide detailed instructions on properly donning and doffing respirators, including adjusting straps and checking for proper fit.
- Explain the importance of maintaining a clean and sanitary respirator, including regular cleaning, sanitization, and storage procedures.
- Emphasize the importance of replacing disposable respirators and worn-out components of reusable respirators as needed.

Emergency Procedures:

- Review emergency procedures in the event of a respirator malfunction, loss of seal, or exposure to hazardous substances.
- Explain how to safely remove a respirator in an emergency situation and seek medical assistance if necessary.

Annual Training

Updates and Changes:

- Review any updates or changes to the respiratory protection program, including new regulations, policies, procedures, or equipment.
- Provide information on any new respiratory hazards identified in the workplace and the corresponding protective measures.

Refresher Training:

- Reinforce key concepts covered in the initial training session, including proper respirator selection, fit testing, use, and maintenance.
- Conduct hands-on demonstrations and practical exercises to ensure users are proficient in donning, doffing, and performing user seal checks.

Recordkeeping and Documentation:

- Review the importance of maintaining accurate records of fit testing results, training sessions, and any respirator-related incidents or issues.
- Ensure that all users understand their responsibility to report any changes in health status that may affect respirator fit or use.

Importance of Proper Equipment Maintenance

Proper maintenance of respiratory protection equipment is essential for ensuring its effectiveness in providing adequate protection against respiratory hazards. Regular maintenance helps extend the lifespan of the equipment, prevents premature wear and tear, and reduces the risk of malfunction or failure during use. Below, we highlight the importance of proper equipment maintenance and provide guidance on best practices:

Ensuring Equipment Reliability

Regular maintenance helps ensure that respiratory protection equipment remains in good working condition, free from defects or damage that could compromise its effectiveness. By conducting routine inspections and servicing, individuals can identify and address any issues promptly, minimizing the risk of equipment failure when needed most.

Preserving Performance

Respiratory protection equipment, such as respirators and filters, rely on specific components and materials to provide the intended level of protection against airborne contaminants. Proper maintenance helps preserve the performance of these components, ensuring that they function as intended and meet the required safety standards. This includes cleaning, sanitizing, and replacing parts as necessary to maintain optimal performance.

Minimizing Contamination

Respiratory protection equipment may be exposed to various environmental contaminants during use, including dust, particles, and biological agents. Regular cleaning and maintenance help remove contaminants from the equipment, reducing the risk of cross-contamination and preventing the buildup of harmful substances that could compromise respiratory health.

Promoting Comfort and Compliance

Well-maintained equipment is more comfortable to wear and encourages greater compliance with respiratory protection protocols. Clean, properly fitting respirators are less likely to cause discomfort or irritation to the wearer, promoting consistent use and adherence to safety guidelines. By prioritizing equipment maintenance, individuals can enhance their comfort and overall satisfaction with respiratory protection measures.

Best Practices for Equipment Maintenance

By emphasizing the importance of proper equipment maintenance and adhering to best practices, individuals can ensure that respiratory protection equipment remains reliable, effective, and comfortable to use, contributing to a safer and healthier work and academic environment at Georgia Tech. To ensure the effectiveness of respiratory protection equipment, individuals should follow these best practices for maintenance:

- **Regular Inspections**: Conduct visual inspections of respiratory protection equipment before each use to check for signs of damage, wear, or deterioration. Look for cracks, tears, or missing components that may affect the performance of the equipment.

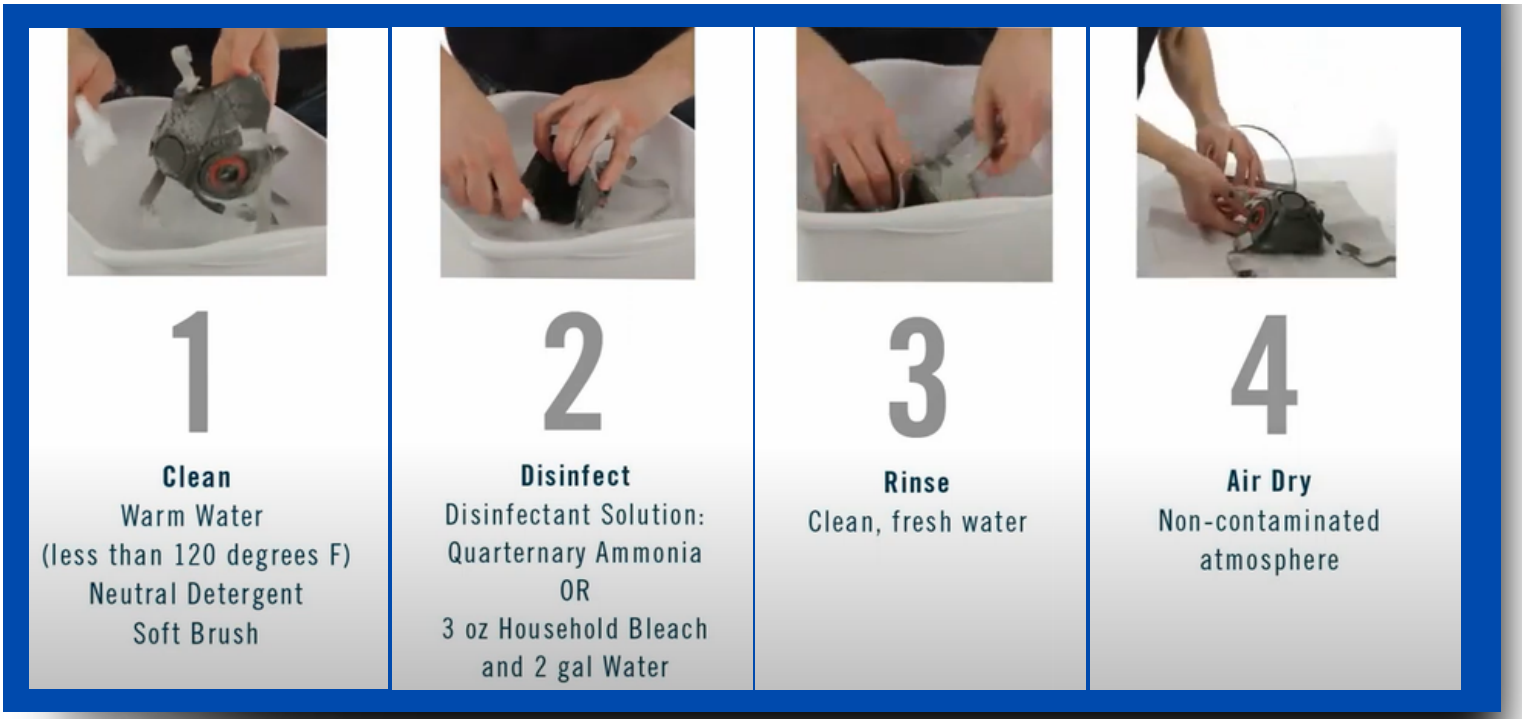
- **Cleaning and Sanitizing**: Clean respirators and other equipment regularly according to manufacturer guidelines using approved cleaning agents and disinfectants. Pay special attention to areas that come into contact with the face to remove dirt, oil, and debris that could affect the seal and comfort of the respirator.

- **Storage and Handling**: Store respiratory protection equipment in a clean, dry location away from sunlight, extreme temperatures, and contaminants. Use protective cases or storage bags to prevent damage during transport or when not in use. Avoid placing heavy objects on top of respirators or exposing them to sharp edges that could cause punctures or tears.

- **Replacement of Components**: Replace worn-out or damaged components, such as filters, cartridges, straps, and seals, according to manufacturer recommendations or when signs of wear are observed. Follow proper procedures for replacing components to ensure compatibility and effectiveness.

- **Documentation**: Maintain records of equipment maintenance activities, including inspection dates, cleaning schedules, and component replacements. Keep track of any issues or repairs conducted to identify trends or patterns that may require further attention.

Best Practices for Cleaning Equipment



CLEANING IS RECOMMENDED AFTER EACH USE.

Respirator Cleaning Wipes may be used as an interim method in the cleaning schedule for individually assigned respirators, but this should not be the only method in place.

1. Remove cartridges and filters.

2. Clean facepiece (excluding filters) by immersing in warm cleaning solution, the water temperature should not exceed 49° C, and scrub with soft brush until clean. Add neutral detergent if necessary. Do not use cleaners containing lanolin or other oils.

3. Disinfect the facepiece by soaking in a solution of quaternary ammonia disinfectant or dilute sodium hypochlorite (30 mL household bleach in 7.5 L of water), or another suitable disinfectant.

4. Rinse in fresh, warm water and air dry in a clean non-contaminated area.

5. Inspect the respirator components prior to reassembly. A respirator with any damaged or deteriorated components must be repaired or discarded.

6. Store the clean respirator away from contaminated areas when not in use.

Requirement for Medical Evaluations for Respirator Users

According to OSHA standards, particularly under the Respiratory Protection Standard (29 CFR 1910.134), all employees required to use respirators must first undergo a medical evaluation. This requirement ensures that individuals are physically capable of wearing a respirator without risking their health, especially given that certain medical conditions may be exacerbated by respirator use.

Process and Frequency of Evaluations

- Initial Evaluation: Before an user is fit-tested or cleared to use a respirator on campus, an initial medical evaluation is mandatory to determine their capability to wear a respirator.
- Questionnaire: The evaluation process typically begins with the user completing a confidential medical questionnaire, which is then reviewed by a healthcare professional. In some cases, a follow-up medical examination may be necessary.

Additional Evaluations: Further evaluations are required if:

- An user reports medical signs or symptoms related to respirator use.
- A healthcare professional, supervisor, or the respirator program administrator identifies a need for reevaluation.
- Changes in the workplace conditions may result in an increased physiological burden on the user.

Importance of Medical Evaluations and How to Schedule Them

Medical evaluations are a critical component of the Right Fit Respiratory Protection Program, ensuring that individuals are medically cleared to wear respiratory protection equipment safely. These evaluations help identify any underlying health conditions that may affect the wearer's ability to use respirators effectively. Below, we discuss the importance of medical evaluations and provide guidance on how to schedule them through the enrollment process and online medical questionnaire:

Ensuring Fitness for Respirator Use

- Medical evaluations help determine whether individuals are physically and medically fit to wear respiratory protection equipment. Certain medical conditions, such as respiratory diseases, cardiovascular disorders, or claustrophobia, may pose risks when using respirators. By undergoing medical evaluations, individuals can receive clearance or recommendations regarding the use of respirators based on their health status.

Identifying Health Risks

- Medical evaluations provide an opportunity to identify and address potential health risks that may affect respiratory protection. Health conditions such as asthma, chronic obstructive pulmonary disease (COPD), or allergies may increase the risk of adverse reactions to respirator use. Identifying these risks allows for appropriate accommodations or alternative respiratory protection measures to be implemented to ensure the individual's safety and well-being.

Compliance with Regulatory Requirements

- OSHA regulations mandate that employers provide medical evaluations for employees required to wear respirators in the workplace. By adhering to these regulatory requirements, Georgia Tech demonstrates its commitment to ensuring the health and safety of its workforce. Medical evaluations also help the university maintain compliance with other relevant health and safety standards and regulations.

To initiate the enrollment process and schedule a medical evaluation, individuals can follow these steps:

Ensuring Fitness for Respirator Use

- To initiate the enrollment process, access the risk assessment survey, contact the program administrator, or a member of EHS. The enrollment survey may be accessible through EHS website.

Completion of Online Medical Questionnaire

- As part of the enrollment process, individuals will be required to complete an online medical questionnaire. This questionnaire collects essential information about the individual's medical history, current health status, and any existing health conditions that may impact respiratory protection.

Review and Assessment

- Once the online medical questionnaire is submitted, it will be reviewed by qualified healthcare professionals, such as occupational health physicians or certified medical examiners. These professionals will assess the individual's medical history and health status to determine their suitability for respirator use.

Medical Clearance or Follow-Up Recommendations

- Based on the review and assessment, individuals will receive medical clearance for respirator use if deemed fit. In some cases, follow-up evaluations or additional medical assessments may be recommended to address specific health concerns or conditions.

By undergoing medical evaluations and following the prescribed scheduling process, individuals can ensure that they are medically cleared to wear respiratory protection equipment safely. These evaluations play a crucial role in safeguarding the health and well-being of individuals in environments where respiratory hazards may be present.

Confidentiality and Recordkeeping

Confidentiality:

The medical questionnaire and examination results are strictly confidential, accessible only by the healthcare provider and not disclosed to the employer without the employee's consent.

Recordkeeping:

OSHA requires that records of medical evaluations be maintained and made accessible to employees or their representatives. These records should include the name of the healthcare professional conducting the evaluation, the date of the evaluation, and a statement confirming the employee's clearance to use a respirator.

This approach to medical evaluations adheres to OSHA's guidelines, prioritizing employee health and safety while ensuring privacy and compliance with regulatory standards.

Confidentiality and meticulous recordkeeping are the cornerstones of trust in our program, ensuring every individual's health information is both respected and protected.

Importance of Fit Testing

Fit testing is a critical step in the Right Fit Respiratory Protection Program, ensuring that respirators provide an effective seal to the wearer's face and offer maximum protection against airborne contaminants. Fit testing assesses the compatibility of the respirator with the individual's facial characteristics and ensures that the respirator provides a secure and comfortable fit. Below, we discuss the importance of fit testing and provide guidance on how to prepare for it:

Ensuring Proper Protection

Fit testing ensures that respirators fit securely and form a tight seal around the wearer's face, preventing airborne contaminants from entering through gaps or leaks. A proper fit is essential for the respirator to provide the intended level of protection against respiratory hazards, minimizing the risk of exposure and associated health effects.

Personalized Fit

Fit testing is individualized and takes into account the unique facial characteristics of each wearer. During fit testing, individuals are assessed to determine the most suitable respirator size and model that provides an optimal fit for their face shape and size. This personalized approach enhances comfort and ensures that the respirator remains in place during use, minimizing the need for frequent adjustments.

Compliance with Regulations

Fit testing is a regulatory requirement mandated by OSHA for employers with respiratory protection programs. By conducting fit testing, Georgia Tech demonstrates compliance with regulatory standards and ensures that the program meets the highest safety standards to protect the health and well-being of its community members.

Preparing for Fit Testing

By understanding the importance of fit testing and adequately preparing for the process, individuals can ensure that they receive the maximum benefit from respiratory protection equipment and contribute to a safer and healthier work and academic environment at Georgia Tech.

1. Review Information: Familiarize yourself with the purpose and procedures of fit testing by reviewing educational materials provided by the program, such as training modules or informational handouts. Understanding the importance of fit testing and its role in respiratory protection will help you approach the process with confidence.

2. Review Information: Familiarize yourself with the purpose and procedures of fit testing by reviewing educational materials provided by the program, such as training modules or informational handouts. Understanding the importance of fit testing and its role in respiratory protection will help you approach the process with confidence.

3. Select Proper Equipment: Ensure that the respirator selected for fit testing is the same model and size that will be used in the workplace or academic setting. Proper selection of equipment is crucial for achieving an accurate fit during testing and ensuring compatibility with the individual's facial characteristics.

4. Follow Instructions: During fit testing, follow the instructions provided by the fit tester or healthcare professional administering the test. Be cooperative and attentive throughout the testing process, and communicate any discomfort or issues experienced during the test to the tester.

5. Participate Actively: Actively participate in the fit testing process by performing the required movements, such as deep breathing, speaking, and moving the head from side to side. These movements simulate real-world conditions and help assess the adequacy of the respirator fit during various activities.

Suitable Facial Hair Styles for Respirators

Being Clean shaven isimportant to achieve respiratory protection, but there are some hair styles that may be suitable

If users have any facial hair that interferes with any sealing surface area of a respirator or long facial hair that also interferes with any valves or function of the mask, then a loose fitting head-top on a PAPR blower may need to be considered as a suitable alternative to the wearer removing interfering facial hair.

Courtesy of the CDC NIOSH

Types of Fit Tests

Fit testing is a critical component of a respiratory protection program, ensuring that the selected respirator provides an effective seal and the maximum level of protection against airborne hazards. The two primary methods used to assess this seal are qualitative and quantitative fit tests. Georgia Tech EHS only carries out quantitative fit tests.

QUALITATIVE FIT TEST

Qualitative Fit Test (QLFT) involves the application of a harmless test agent to determine if the respirator wearer can detect its presence through taste, smell, or irritation. This test is generally used for filtering facepieces and half-mask respirators where a precise fit factor is not required. The outcome is subjective, relying on the individual's response to the test agent.

QUANTITATIVE FIT TEST

Quantitative Fit Test (QNFT) offers a more precise assessment by measuring the actual amount of leakage into the respirator, providing a numerical fit factor. This method is suitable for all types of tight-fitting respirators, including full-face pieces. Advanced equipment is used to calculate the fit factor, making the QNFT a preferred choice for higher-risk environments where a more stringent evaluation of the respirator fit is necessary.

Ambient Aerosol Quantitative Fit Testing

Ambient aerosol QNFT instruments measure aerosol concentration outside and inside the respirator and compute a true fit factor. A challenge agent is used as ambient microscopic dust and other aerosols that are present in the air we breathe at all times. This allows the instrument to be small, light weight, easier to maintain, and less expensive. The PORTACOUNT® is an ambient aerosol fit tester.

Types of Respirators

- Half-face
- Full-face
- Gas mask
- PAPR
- SCBA
- Filtering-facepieces:
  - 100/99/95/P1/P2/P3/ HEPA

Courtesy of the TSI

How Ambient Aerosol Works

Ambient Aerosol Quantitative Fit Testing (AAQFT) is a method used in quantitative fit testing of respirators. Unlike other methods that might use generated test agents, AAQFT utilizes the particles naturally present in the ambient air as the test aerosol. During the test, a device measures the concentration of these ambient particles both inside and outside the respirator. The ratio of these concentrations is used to calculate the fit factor, which indicates how well the respirator fits the user and how effectively it seals against the user's face. This method is advantageous because it doesn't require the introduction of a test substance into the environment, making it suitable for a wide range of settings and applications.

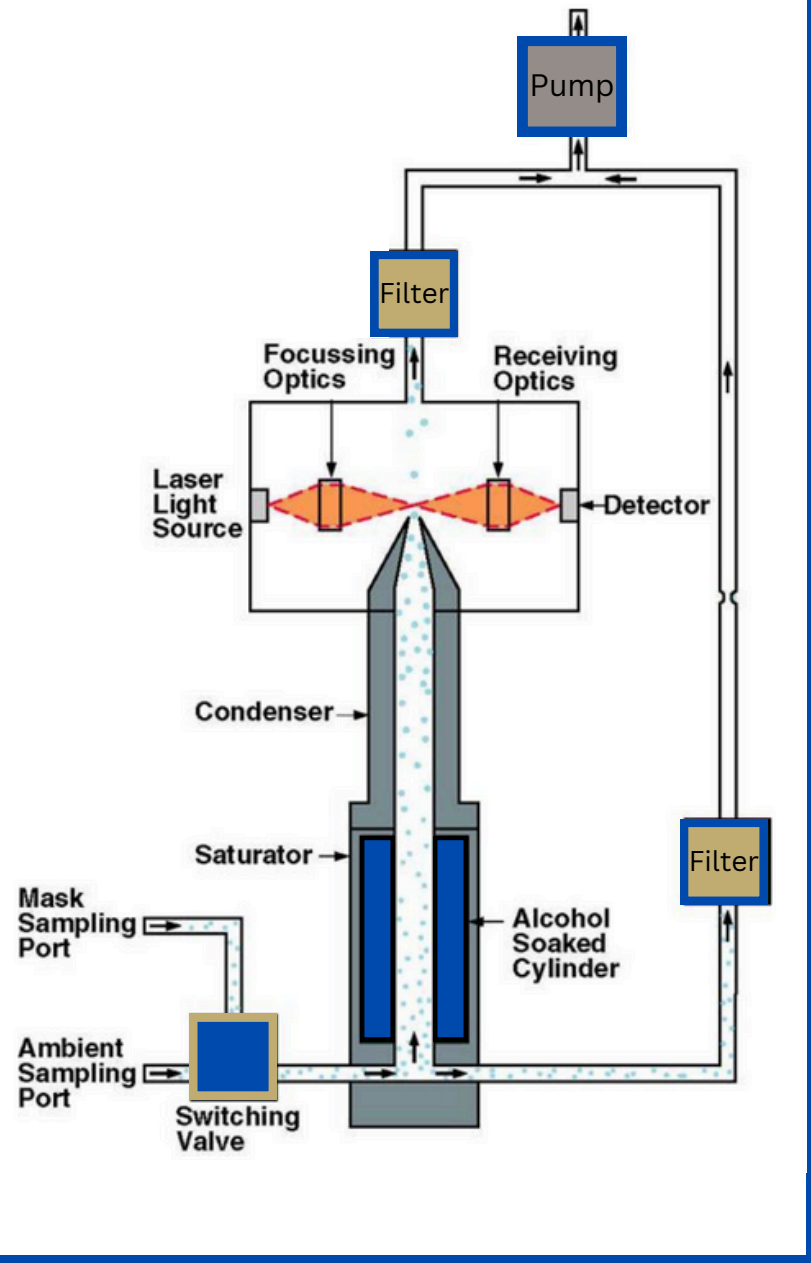
Fit Factor

$$\text{Fit Factor} = \frac{C_o}{C_i}$$

C_o = Concentration outside the respirator

C_i = Concentration inside the respirator

The resulting fit factor represents the amount of leakage into the respirator. A fit factor of 100 means that the air inside the respirator is 100 times as clean as the air outside.



Aerosol is drawn through the instrument by a diaphragm vacuum pump operating at a flow rate of 1.0 liter per minute. The flow enters the instrument through either the ambient port or the sample port. The switching valve determines which port is used. The outlet of the switching valve leads to the saturator end cap, where the flow splits.

A flow rate of 0.35 liters per minute enters the saturator and passes through the condenser, nozzle, and sensing volume. The remaining flow passes through the excess airline and is recombined with the sampled flow down-stream of the sensing volume.

The PortaCount Pro+ uses isopropyl alcohol (pure reagent grade, 99.5%) to condense microscopic particles in the air into larger droplets that are easier to detect and count.

Modified Ambient Aerosol Quantitative Fit Testing Protocol

On September 25, 2019, OSHA announced the addition of two new fit testing protocols to 29 CFR 1910.134 Appendix A – shorter versions of the previously existing QNFT method, which is performed with the PortaCount®.

Excerise #1

Bending Over. Bend at the waist, as if going to touch your toes for 50 seconds and inhale 2 times at the bottom

Excerise #2

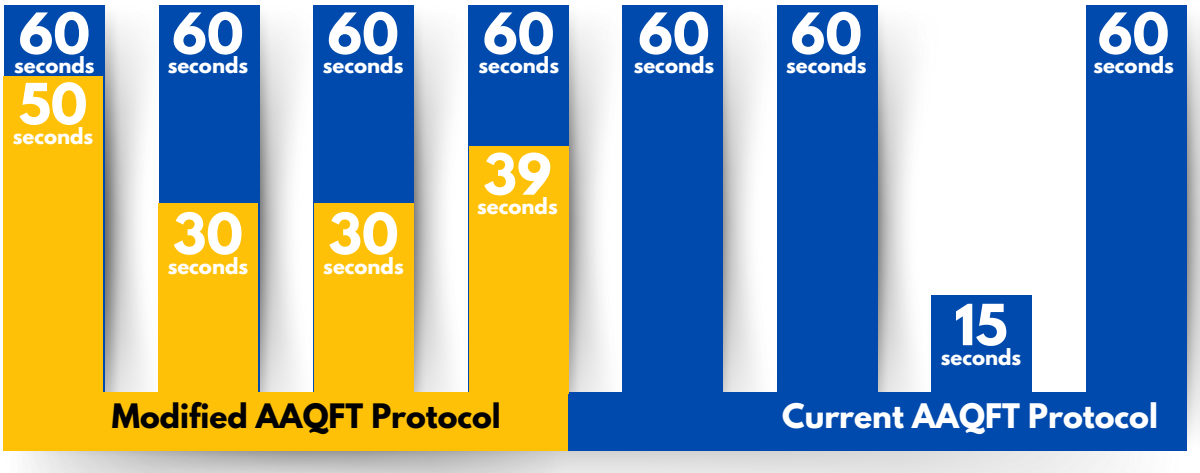
Jogging in place. Jog in place comfortably for 30 seconds

Excerise #3

Head side to side. Stand in place, slowly turning your head from side to side for 30 seconds and inhale 2 times at each extreme

Excerise #4

Head up and down. Stand in place, slowly moving your head up and down for 39 seconds and inhale 2 times at each extreme



TOTAL: 4 steps 2:29 time

TOTAL: 8 steps 7:15 time

Controlled Negative Pressure

Ambient aerosol QNFT instruments measure aerosol concentration outside and inside the respirator and compute a true fit factor. A challenge agent is used as ambient microscopic dust and other aerosols that are present in the air we breathe at all times. This allows the instrument to be small, light weight, easier to maintain, and less expensive. The PORTACOUNT® is an ambient aerosol fit tester.

Types of Respirators

Courtesy of the OHD

How Controlled Negative Pressure Works

Controlled Negative Pressure (CNP) is a quantitative fit testing method for respirators. This technique evaluates the fit by applying a specific negative pressure inside the mask and then measuring the rate at which air flows into the mask due to the pressure differential. The basic principle is to create a vacuum within the sealed mask and monitor how quickly external air infiltrates the mask to equalize the pressure, indicating potential leaks and the overall fit quality.

During a CNP test, the respirator's inlets are sealed, and a vacuum is applied, reducing the pressure inside the mask. The equipment then measures the air volume required to maintain this negative pressure for a set duration. A higher air volume indicates a poorer fit due to air leakage. CNP fit testing is particularly useful because it does not rely on the subject's sense of taste, smell, or irritation to detect a leak, making it an objective assessment method. It's suitable for testing the fit of both half-mask and full-face respirators.

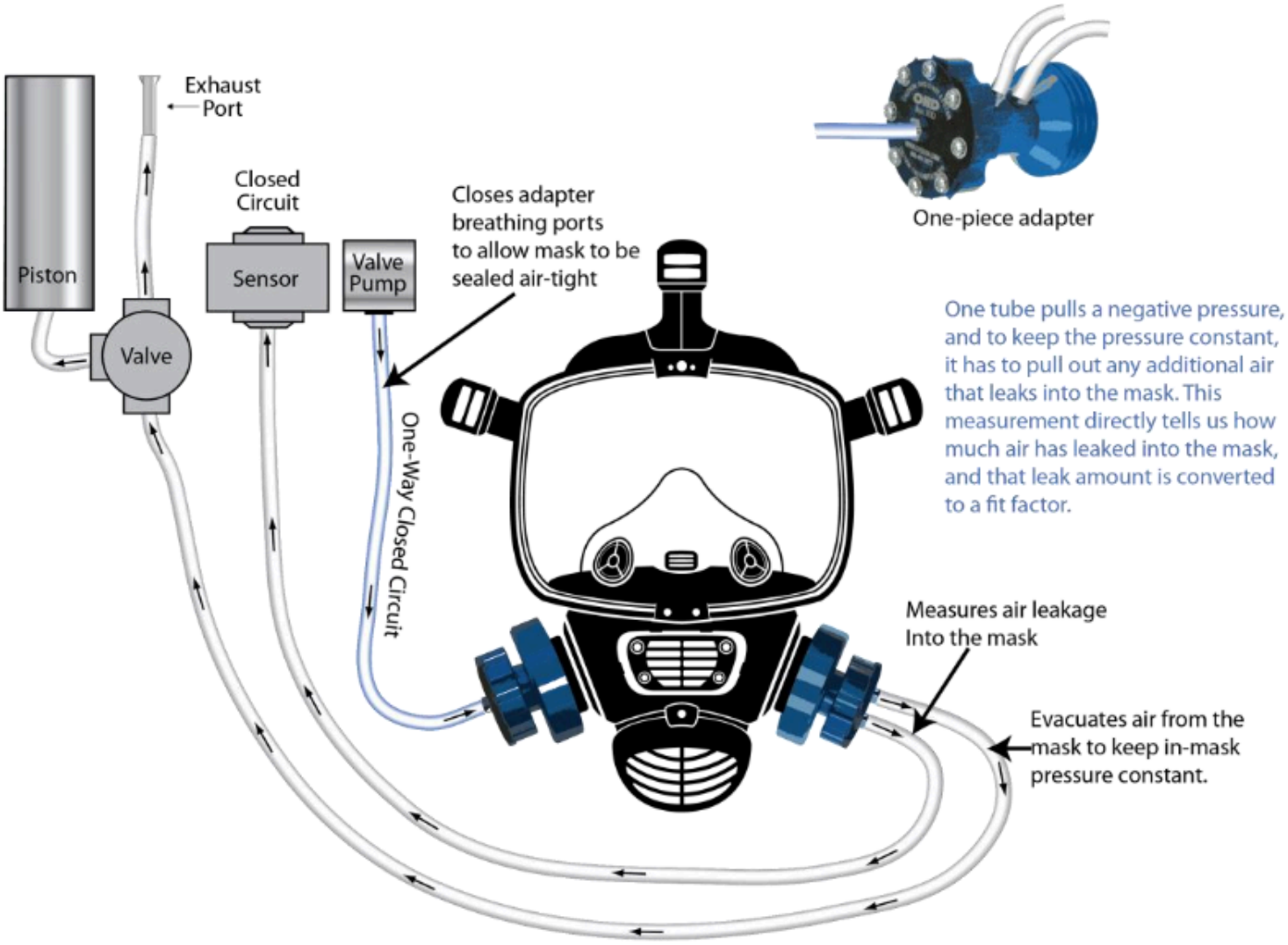
Fit Factor

$$\text{Fit Factor} = \frac{\text{MBR}}{\text{MLR}}$$

MBR = Modeled Breathing Rate (cc/min)
MLR = Measured Leak Rate (cc/min)

The modeled breathing rate (MBR) is the rate at which an individual could be expected to breathe under moderate to heavy working conditions. The MBR is predetermined for the standard respirator types. The MBR is calculated from the parameters specified by the operator for custom respirators.

The measured leak rate (MLR) is directly related to respirator fit and integrity. All fit factors are calculated from the MLR. The QuantiFit2 directly measures air leakage in cubic centimeters per minute (cc/min) and then calculates the fit factor (FF).


Exhaust Port
Closed Circuit
Piston
Sensor
Valve Pump
Valve
Closes adapter breathing ports to allow mask to be sealed air-tight
One-piece adapter
One tube pulls a negative pressure, and to keep the pressure constant, it has to pull out any additional air that leaks into the mask. This measurement directly tells us how much air has leaked into the mask, and that leak amount is converted to a fit factor.
One-Way Closed Circuit
Measures air leakage Into the mask
Evacuates air from the mask to keep in-mask pressure constant.

Redon Protcol (5-Steps)

1 **Facing forward.** In a normal standing position, without talking, the user must breathe normally for 30 seconds; then, while facing forward, they must hold their breath for 10 seconds for test measurement.

2 **Bending over.** The user must bend at the waist for 30 seconds as if they are going to touch their toes; then, while facing parallel to the floor, theymust hold his or her breath for 10 seconds for test measurement.

3 **Head shaking.** The user must shake their head back and forth vigorously several times while shouting for approximately three seconds; then, while facing forward, they must hold their breath for 10 seconds for test measurement.

4 **First redonning (REDON- #1)**. The user must remove the respirator, loosen all facepiece straps, and then redon the respirator mask; after redonning the mask, they must face forward and hold their breath for 10 seconds for test measurement.

5 **Second redonning (REDON #2)**. The user must remove the respirator, loosen all facepiece straps, and then redon the respirator mask again; after redonning the mask, they must face forward and hold their breath for 10 seconds for test measurement.

Fit Test
the responsibility of the GT EHS

Faces can vary widely in shape, size, and proportion so selecting the correct model is vital for a safe fit

Protection relies on achieving a good seal between the facepiece and the wearer's face

Tight-fitting respirators should be tested: disposable respirators, reusablehalf-masks, and reusablefull-face masks

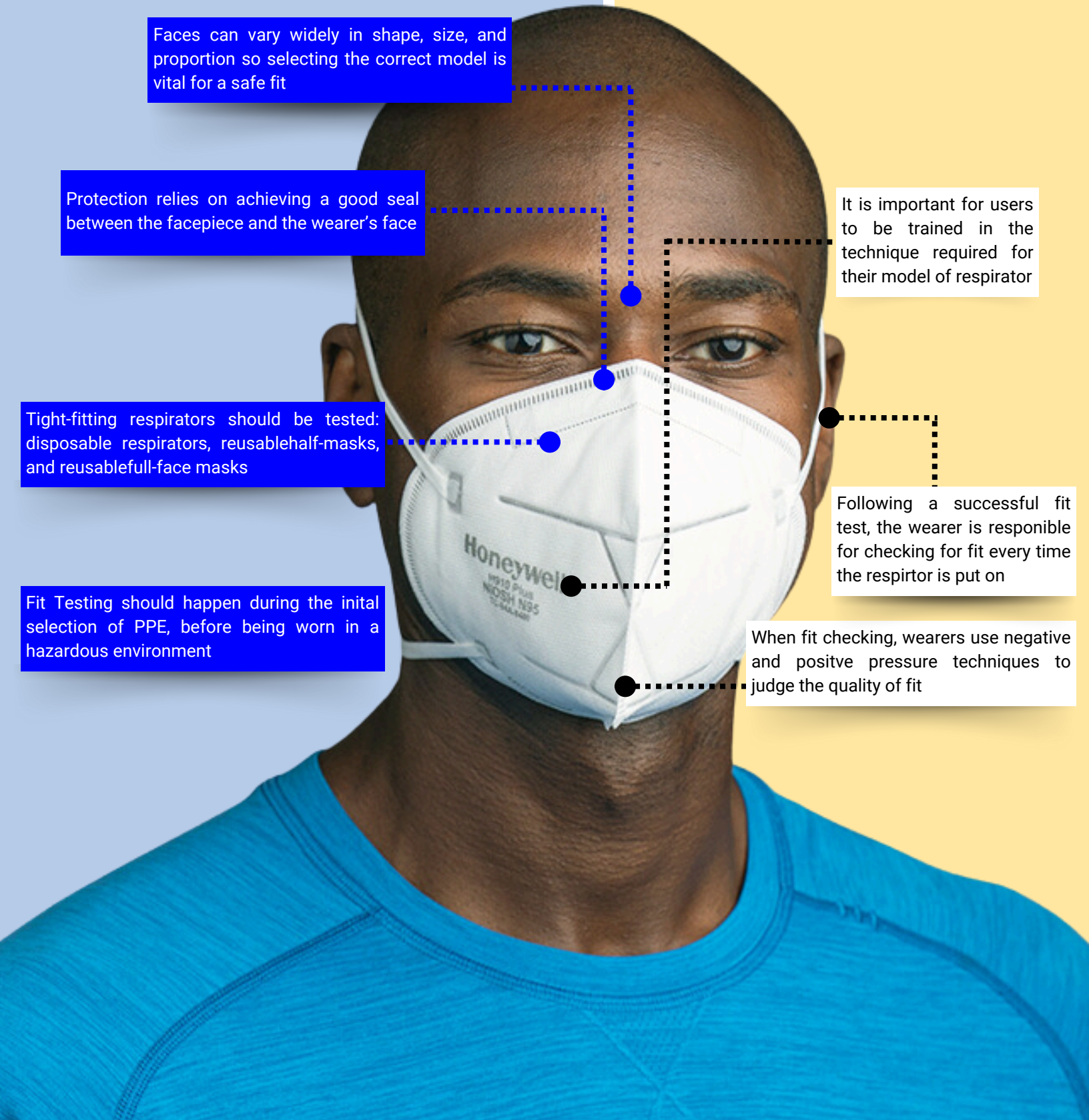
Fit Testing should happen during the inital selection of PPE, before being worn in a hazardous environment

Fit Check
the responsibility of the wearer

It is important for users to be trained in the technique required for their model of respirator

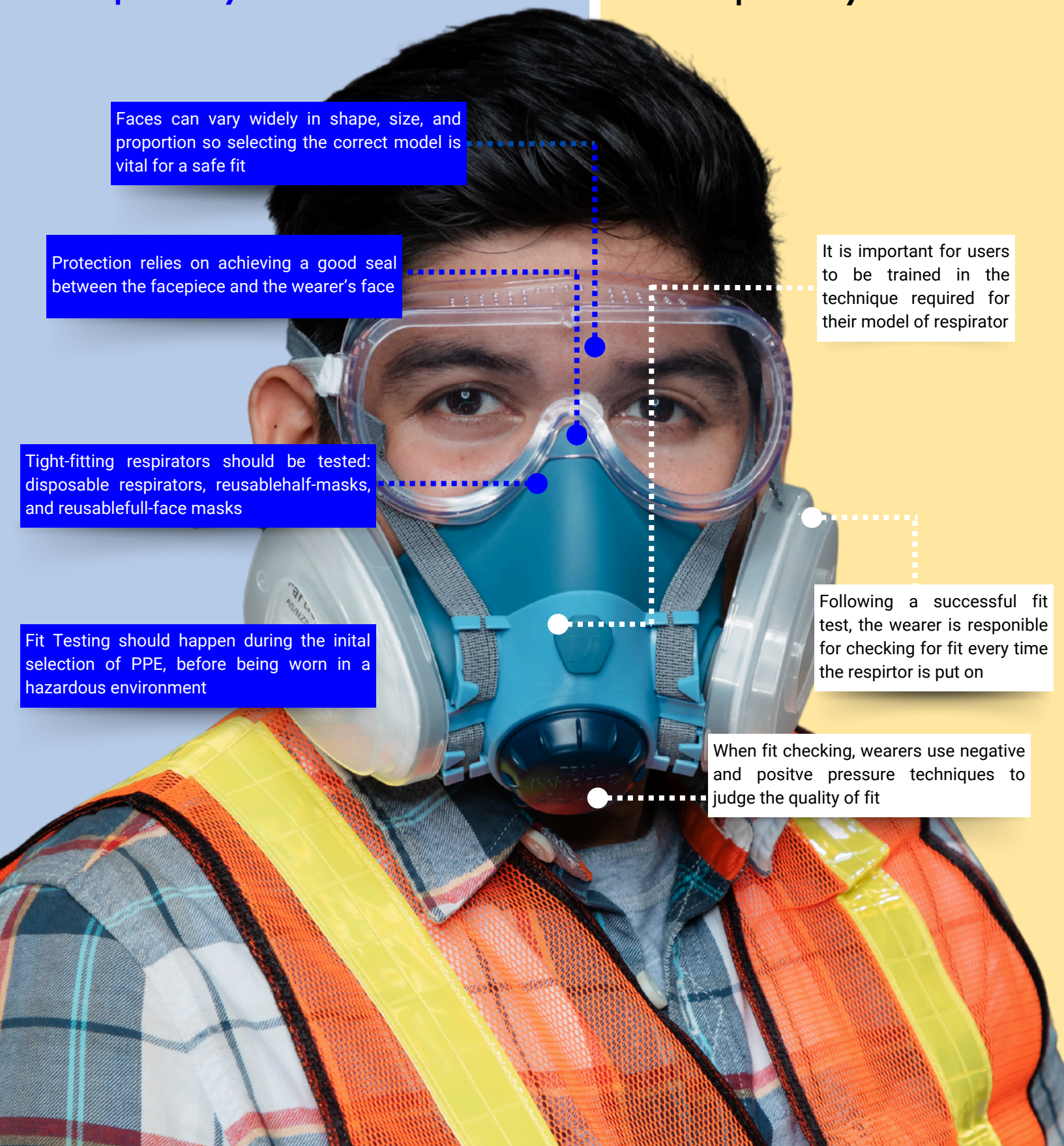
Following a successful fit test, the wearer is responible for checking for fit every time the respirtor is put on

When fit checking, wearers use negative and positve pressure techniques to judge the quality of fit



Fit Test
the responsibility of the GT EHS

Fit Check
the responsibility of the wearer



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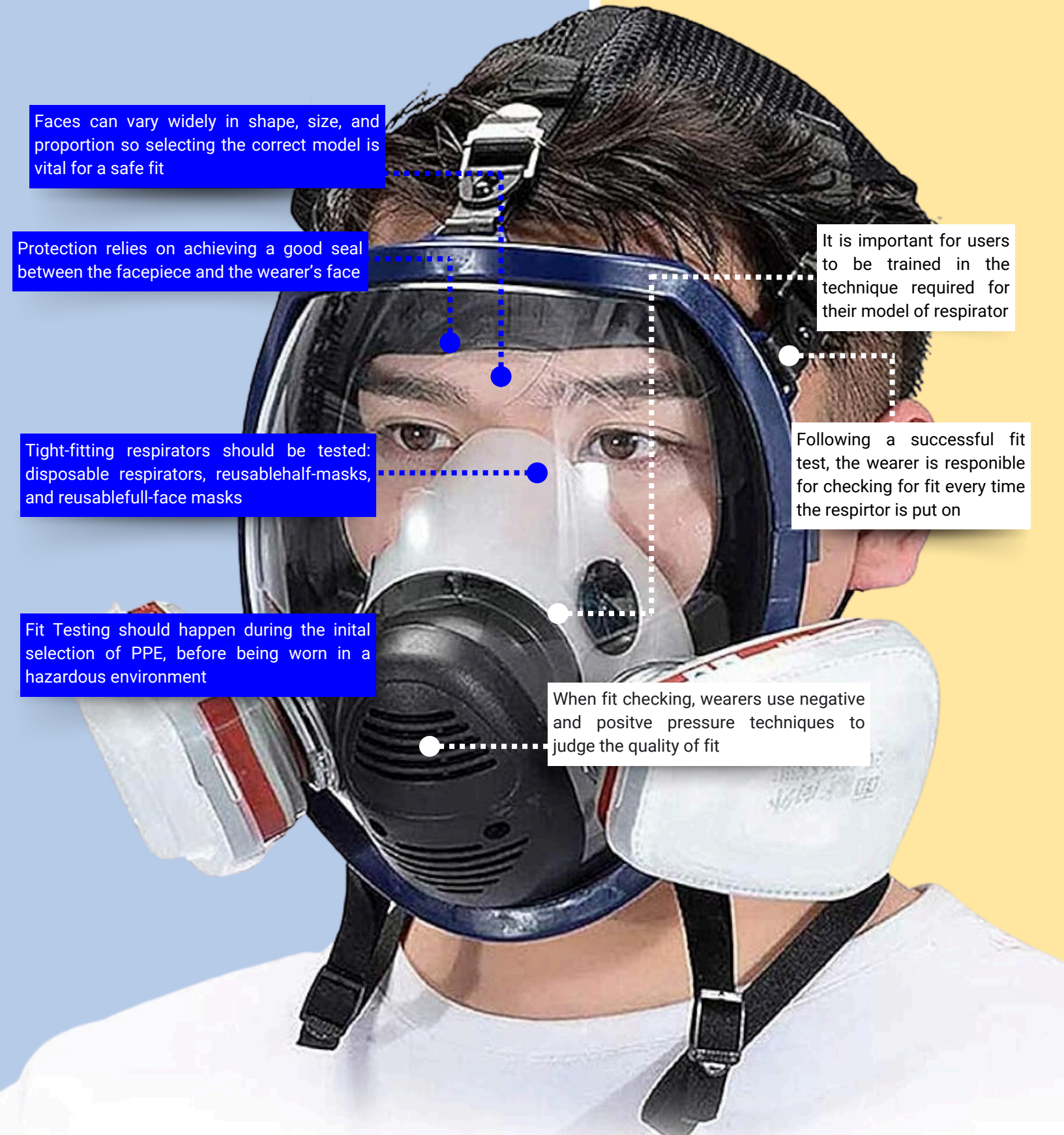

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Frequency and Documentation of Fit Tests

Consistency and meticulous record-keeping are essential for the integrity of the fit testing process.

Initial and Annual Testing:

Prior to the initial use of a respirator in the workplace, an appropriate fit test must be conducted to ensure a proper seal. Recognizing that facial changes, weight fluctuations, or dental work can affect the fit, OSHA mandates annual retesting to maintain the efficacy of the respiratory protection.

Comprehensive Documentation:

Detailed records of each fit test are crucial. These records should include the test date, the specific test protocol used, the make, model, and size of the respirator tested, and the test results. Maintaining these records helps in tracking compliance and in making informed decisions for future respiratory protection needs.

Addressing Fit Test Failures

Failure to achieve an adequate fit calls for immediate and systematic action to ensure no individual is left unprotected.

1

Respirator Reassessment:
The initial step involves reassessing the choice of respirator. This may involve trying different sizes, models, or brands to find a more suitable fit. It's not uncommon for individuals to require a different size or style than initially presumed.

2

Enhanced Training:
Incorrect donning techniques can lead to failed fit tests. Additional hands-on training can help rectify common mistakes in putting on the respirator, adjusting straps, and checking the seal.

3

Medical Reevaluation:
Persistent fit issues might signal underlying problems not apparent during the initial medical evaluation. In such cases, a further medical review can identify issues like facial abnormalities or respiratory conditions that could affect the fit.

4

Exploring Alternatives:
If a tight-fitting respirator cannot achieve a proper seal, alternative solutions such as Powered Air-Purifying Respirators (PAPRs) may be explored. PAPRs do not require a tight seal on the face, making them a viable option for individuals who cannot achieve a fit with conventional respirators.

Through these expanded measures, the Right Fit Respiratory Protection Program aims to ensure that every member of the Georgia Tech community is adequately protected against respiratory hazards, underscoring the institution's commitment to health and safety.

Program Evaluation

Evaluating the effectiveness of the Right Fit Respiratory Protection Program is essential to ensure it meets the safety and health standards required to protect the Georgia Tech community. This evaluation is an ongoing process that helps identify areas for improvement and assesses the success of the program in reducing respiratory hazards.

Evaluation Objectives

Assess Compliance

Determine the degree to which program participants adhere to established protocols and procedures. Compliance is measured through routine inspections, audits, and review of training records.

Measure Effectiveness

Evaluate the protective performance of respiratory equipment by reviewing fit test results and monitoring incident reports related to respiratory hazards. Effectiveness also includes the evaluation of medical clearance records and feedback from program participants about their experiences and satisfaction.

Identify Improvement Areas

Through data collected from various feedback mechanisms, identify aspects of the program that require enhancement. This may involve updating training methods, revising equipment choices, or improving communication and documentation practices.

Regular Program Review and Updates

To maintain the highest standards of respiratory protection, the Right Fit Respiratory Protection Program at Georgia Tech undergoes regular reviews and updates. These periodic assessments ensure that the program remains aligned with the latest safety regulations, technological advancements, and the evolving needs of the campus community. Reviews are scheduled on an annual basis, with provisions for ad-hoc updates in response to significant changes in workplace conditions, regulatory requirements, or after incident reports.

Evaluation Methods

Surveys and Feedback Forms:

Regularly distribute surveys and feedback forms to gather input from all stakeholders, including program administrators, safety officers, and respirator users. This feedback is crucial for assessing user satisfaction and the practical aspects of the program.

Audit Reports:

Conduct periodic audits to ensure compliance with both internal standards and external regulations. These audits help pinpoint discrepancies and areas that need immediate attention.

Incident and Health Data Analysis:

Analyze data from incident reports and health surveillance to detect trends that might indicate failures or successes of the program. Such analysis helps in proactively addressing potential issues before they escalate.

Benchmarking:

Compare program performance against industry standards or similar programs at other institutions. This comparison can highlight strengths and weaknesses and foster a culture of continuous improvement.

Criteria for Program Effectiveness Evaluation

The ultimate goal of the program evaluation is to create a dynamic and responsive framework that consistently upholds the highest standards of respiratory safety, ensuring that Georgia Tech remains a leader in health and safety education.

Evaluating the effectiveness of the respiratory protection program involves several key criteria:

1

Compliance Rates:

Monitoring adherence to the program's policies and procedures, including proper use and maintenance of respiratory equipment.

2

Incident and Exposure Reports:

Analyzing incidents of respiratory exposure or health concerns related to inadequate respiratory protection to identify potential program gaps.

3

Fit Test Success Rates:

Assessing the percentage of successful fit tests as an indicator of the appropriateness of the selected respiratory protection equipment.

4

Training Completion and Retention:

Evaluating the completion rates of required training sessions and the retention of knowledge and skills related to respiratory protection.

5

User Satisfaction:

Gauging the satisfaction levels of program participants with the respiratory protection provided, including comfort, ease of use, and accessibility of equipment and resources.

Emergency Procedures

The Right Fit Respiratory Protection Program includes a comprehensive section on emergency procedures to ensure swift and effective responses to respiratory incidents at Georgia Tech. This section outlines the steps to be taken in the event of a respiratory hazard emergency, ensuring the safety and well-being of all campus community members.

"Preparedness transforms crisis into action—our emergency procedures ensure that every response is swift, coordinated, and effective, safeguarding our community in critical moments."

Immediate Response Actions

Evacuation: Evacuate to a safe area and close doors as you exit the space. Follow the pre-determined evacuation routes posted in all campus buildings. Evacuation plans should be clearly displayed and regularly reviewed during training sessions.

Notification: Immediately report any respiratory emergency to Georgia Tech Police at **404-894-2500**, THEN GT EHS, through the designated emergency hotline at **404-216-5237**.

First Aid: Administer basic first aid as needed while awaiting the arrival of medical professionals. Specific training on how to handle respiratory distress should be part of the mandatory safety training for all staff.

Coodination with Emergency Services

Emergency Contact List: Maintain an up-to-date list of all key contacts, including local emergency services, hospital contact information, and specialized response teams.

Information Sharing: Provide emergency responders with information about the nature of the respiratory hazard as quickly as possible to facilitate an appropriate response.

Respiratory Emergency Drills

Regular Drills: Conduct regular emergency response drills involving scenarios that may result in respiratory hazards. Drills should simulate real-life scenarios to ensure that all individuals know their roles and responsibilities during an emergency.

Debrief and Feedback: After each drill, conduct a debriefing session to discuss what went well and identify areas for improvement. Feedback from these sessions should be integrated into future training and emergency response planning.

Equipment and Supplies

Emergency Kits: Equip all relevant areas of the campus with emergency respiratory protection kits that include respirators, replacement filters, and other necessary safety equipment.

Maintenance Checks: Regularly check and maintain emergency equipment to ensure it is functional and accessible at all times.

Documentation and Reporting

Incident Logs: Keep detailed logs of all emergency incidents and responses. These logs should include the date, time, details of the incident, actions taken, and outcomes.

Review and Update: Regularly review emergency procedures to reflect new risks, lessons learned from past incidents, and changes in regulatory requirements.

By establishing and maintaining robust emergency procedures, Georgia Tech ensures that its community is prepared to handle any respiratory hazard efficiently and effectively, minimizing risk and enhancing overall safety on campus.

Procedure for Handling Respiratory Distress

Step 1: Assess the Situation

Identify Symptoms: Look for signs of respiratory distress such as difficulty breathing, wheezing, gasping, coughing, or inability to speak.

Ensure Safety: Make sure the environment is safe for you and the victim. Remove any immediate threats if possible.

Step 2: Call for Help

Immediate Notification: Call GT Police **404-216-5237.** Provide clear information about the location and condition of the individual.

Step 3: Assist the Individual

Encourage Calm: Help the person to remain calm by encouraging them to take slow, deep breaths if they are able to breathe on their own.

Position for Comfort: If no spinal injuries are suspected, help the individual into a comfortable position that eases breathing, usually sitting upright.

Loosen Tight Clothing: Loosen any tight clothing around the neck and waist to reduce constriction and facilitate easier breathing.

Step 4: Continuous Monitoring

Monitor Vital Signs: Keep track of the person's breathing and consciousness. Note any changes in their condition.

Provide Reassurance: Stay with the individual until emergency services arrive. Continue to reassure them and monitor their condition.

Step 5: Document the Incident

Record Details: After the situation is under control, document all actions taken during the incident. Note the time of the distress, the actions taken, the response times, and the outcome.

Importance of Recordkeeping

Effective recordkeeping is a cornerstone of the Right Fit Respiratory Protection Program at Georgia Tech. It ensures that all aspects of the program are documented, providing a clear and accountable method for tracking compliance, monitoring the program's effectiveness, and identifying areas for improvement.

Compliance:
Maintains proof of compliance with OSHA regulations and other legal requirements.

Traceability:
Offers a method to trace the history of an individual's respiratory protection training, fit testing, medical evaluations, and use of equipment.

Quality Control:
Helps in assessing the quality and effectiveness of the respiratory protection provided.

Incident Investigation:
Facilitates detailed investigations and analysis if any incidents occur.

Types of Records Maintained

Medical Evaluations: Records of all medical evaluations must be kept confidential. These should include the physician's written recommendation regarding each employee's ability to use a respirator.

Fit Testing Records: Detailed records of annual fit tests for each respirator user, including the date of the test, type of test performed, specific make and model of the respirator tested, and test results.

Training Records: Documentation of training sessions, including dates, contents of the training, the names and qualifications of instructors, and attendance sheets.

Respirator Maintenance Records: Logs of inspections, cleaning, maintenance, and repairs of respiratory equipment, including dates and descriptions of the service and the name of the person who performed the service.

Record Retention

Duration: Records should be kept for specific periods as mandated by OSHA and other regulatory bodies. For instance, medical records and fit test records should be retained for the duration of employment plus thirty years.

Accessibility: Records must be accessible to users, former users, representatives designated by the individual employee, and OSHA upon request.

Security: Ensure that all records, whether digital or physical, are securely stored to protect confidentiality and integrity.

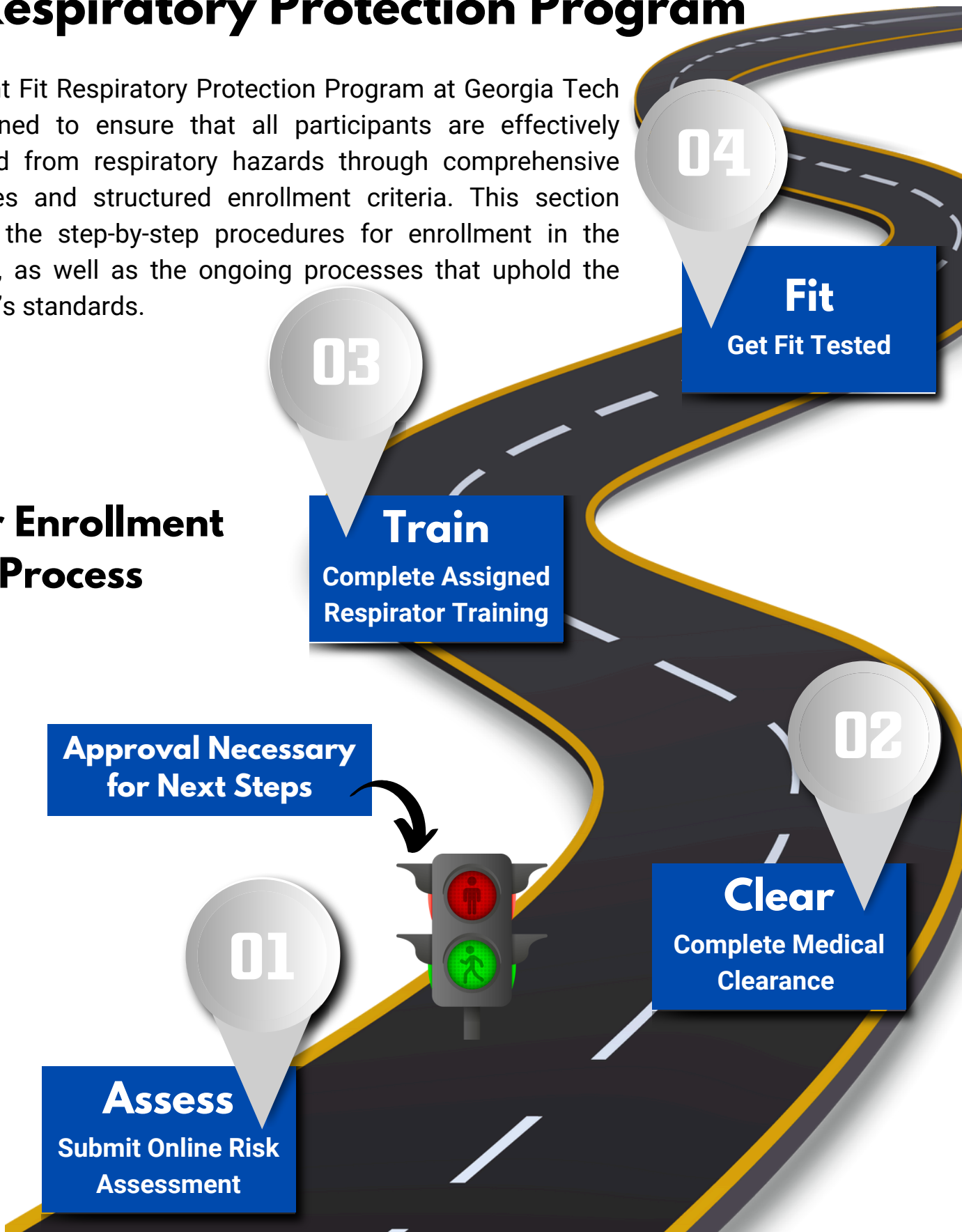
Backups: Regular backups of digital records should be conducted to prevent data loss. Physical records should be stored in a fireproof and waterproof safe to protect against environmental damage.

Routine Checks: Regular audits of record-keeping practices to ensure compliance with established guidelines and to identify any potential issues in data management.

Processes and Enrollment for the Right Fit Respiratory Protection Program

The Right Fit Respiratory Protection Program at Georgia Tech is designed to ensure that all participants are effectively protected from respiratory hazards through comprehensive processes and structured enrollment criteria. This section outlines the step-by-step procedures for enrollment in the program, as well as the ongoing processes that uphold the program's standards.

User Enrollment Process



Detailed Enrollment Process

- [ ] Enrollee Completes the Confidential Risk Questionnaire
- [ ] Enrollee Receives Notice of Their Confidential Risk Questionnaire Has Been Received + Admin Received Notification To Approved New Enrollment
- [ ] Admin Reviews Risk Questionnaire + Either Approves or Denies Enrollment
- [ ] If Approved, Enrollee Receives Notification
- [ ] Enrollee Receives Notification of Approval + What Steps Come Next
- [ ] Admin Uses Information from Risk Questionnaire to Generate Unique Code For Completion of Medical Evaluation Through Respirator Assessor
- [ ] Enrollee Follows the Generated Link to Complete Their Medical Questionnaire
- [ ] Enrollee Uses Unique Code to Complete Their Medical Questionnaire Respiratory Assessor Promises ≤ 24 Hours For Clearance Results
- [ ] Enrollee + Admin Receive Notification of Medical Clearance Results
- [ ] Once Cleared, Admin Will Send Enrollee Information To Complete Training
- [ ] Enrollee Completes Required Training
- [ ] Enrollee + Admin Schedule Fit Testing Appointment
- [ ] Fit Testing Appointment
- [ ] Enrollee Is Now Fully Enrolled + Admin Awaits Next Enrollee

Becoming the Gold Standard

The Right Fit Respiratory Protection Program at Georgia Tech aspires to set the benchmark for excellence in respiratory protection programs at colleges and universities nationwide. This ambition is rooted in a commitment to innovation, comprehensive education, stringent compliance, integrated wellness, and robust community engagement.

"Built on the pillars of Legacy and Leadership, Diversity and Inclusion, Outreach and Education, Accessibility and Usability, and Advocacy and Innovation, our program stands as a beacon of excellence in respiratory protection, ensuring safety and inclusivity for all."

LEGACY & LEADERSHIP

- ***Leadership in Education and Practice***: Fostering a culture of excellence in respiratory protection through leading by example in education, practice, and community engagement.
- ***Strategic Partnerships***: Building and maintaining strategic partnerships with industry leaders and academic institutions to enhance the program's impact and reach.
- ***Innovative Research Initiatives***: Promoting and supporting pioneering research in respiratory protection to keep the program at the forefront of technological and methodological advancements.

DEVELOPMENT & ADVOCACY

- ***Robust Policy Development***: Developing and refining policies prioritizing safety, inclusivity, and community engagement in respiratory protection, advocating for higher standards in health and safety regulations.
- ***Data-Driven Improvements***: Using advanced data analytics to assess and enhance program effectiveness and safety outcomes continuously.
- ***Feedback Integration***: Implementing systematic mechanisms to capture and act upon user feedback, ensuring program responsiveness to community needs.

ACCESSIBILITY & USABILITY

- ***Enhanced Accessibility***: Improving the physical and digital accessibility of respiratory protection resources and training to ensure that they are available to everyone on campus.
- ***Technology Integration***: Leveraging state-of-the-art technology to streamline data collection, refine learning tools, and boost the overall effectiveness of the respiratory protection program.
- ***Inclusive Resource Design***: Designing resources and training programs that accommodate the diverse needs and capabilities of all community members, thus supporting the diversity pillar.

DIVERSITY & INCLUSION

- ***Comprehensive Community Support***: Integrating respiratory health into wider health and wellness initiatives ensures that the program's offerings meet the varied needs of a diverse community.
- ***Global Standards Integration***: Adopting international health and safety standards to broaden the educational scope and promote inclusivity, preparing participants for global engagement.
- ***Diverse Representation***: Striving for diverse representation in program leadership, faculty, and materials to reflect and celebrate the diversity of the Georgia Tech community.

OUTREACH & EDUCATION

- ***Community-Centric Education***: Expanding outreach efforts to educate the Georgia Tech community about respiratory safety, emphasizing the importance of widespread knowledge and preventative measures.
- ***Customized Training Solutions***: Creating training programs tailored to the specific individual needs within the community, ensuring effective learning and active participation.
- ***Collaborative Outreach***: Strengthening collaborations with local organizations, businesses, and educational institutions to extend the reach and impact of respiratory safety initiatives.

A

ACGIH: American Conference of Governmental Industrial Hygienist

Aerosol: liquid or solid particles dispersed in the air, including mists, smokes, fumes, and dusts.

Air-Purifying Respirator (APR): a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

American National Standards Institute (ANSI): a private organization that recommends safe work practices and engineering designs; Z88.2-1992, Respiratory Protection, Z88.6-1984 Respiratory Protection- Respirator Use - Physical Qualifications for Personnel.

Approved: respirators tested and listed as permissible by the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health, Education, and Welfare. The NIOSH approval number is preceded by a "TC" (testing & certification) and indicated on the respirator cartridge or, in the case of single-use or disposable respirators, on the facepiece (ref. T42 CFR 84).

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

Atmosphere-Supplying Respirator (ASR): a respirator that supplies the user with breathing air from a source independent of the ambient atmosphere. It includes supplied air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

B

C

Canister or Cartridge: a container with a filter, sorbent, catalyst, or combination that removes specific contaminants from the air passing through it.

Cartridge: the container(s) housing a filter, sorbent, catalyst, or any combination of these items. The type of cartridge depends upon the contaminant to be removed from the air.

Confined Space: an enclosure such as a storage tank, boiler, sewer, underground utility vault, tunnel, or pit that is difficult to enter or exit and may contain atmospheric or physical hazards.

Contaminant: a harmful, irritating, or nuisance airborne material.

D

Demand Respirator: an atmosphere-supplying respirator that admits breathing air to the facepiece only when inhalation creates a negative pressure inside the facepiece.

Disposable Respirator: a respirator for which maintenance is not intended and designed to be discarded after excessive resistance, sorbent exhaustion, physical damage, or end-of-service life renders it unsuitable for use.

Doff: to remove or to take off

Don: to put on

Dust: an aerosol consisting of solid particles usually produced by mechanical breakup of larger particles. Activities that generate dusts include crushing, chipping, drilling, grinding, sweeping, or handling of solid materials.

Dust Mask: See Filtering Facepiece

E

E**mergency Situation**: 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.

Emergency Respirator Use Situation: a situation requiring the use of a respirator due to the unplanned generation of a hazardous atmosphere (often of unknown composition) caused suddenly by an accident, mechanical failure, or other means and requires evacuation of personnel or immediate entry for rescue or corrective action

Employee Exposure: 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): 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.

Escape-Only Respirator: a respirator intended to be used only for emergency exit.

Exhalation Resistance: the resistance encountered by the wearer when exhaling air through the respirator, influenced by the design and condition of the device.

Exhalation Valve: a device that allows exhaled air to leave a respiratory device and prevents outside air from entering through the valve.

F

Facepiece: the main part of the respirator that covers the wearer's nose and mouth in a half-mask (under the chin) facepiece or covers the nose, mouth, and eyes in a full facepiece.

Filter or Air-Purifying Element: a media component used in respirator cartridges or, in the case of disposable respirators, in the facepiece to remove solid or liquid particles from the air breathed through it. There are now three particulate filter series available for air-purifying respirators:

- N100, N99, and N95 filters (99.97%, 99%, and 95% efficient non-oil filters): to be used with any solid non-oil containing particulate.
- R100, R99, and R95 filters (99.97%, 99%, and 95% efficient oil-resistant filters) can be used for any particulate contaminant. If used for an oil-containing contaminant, filter use is limited to one work shift only.
- P100, P99, and P95 filters (99.97%, 99%, and 95% efficient oil-proof filters) can be used for any particulate contaminant.

Filtering Facepiece (Dust Mask): 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 Check: a positive and negative pressure check performed by the wearer to determine if the respirator is properly seated to the face, providing a gas-tight face seal. The fit of a respirator must be checked each time the respirator is donned. This is normally done by using the palm of the hand to seal the exhalation valve cover and then gently exhaling to form a positive pressure. The respirator cartridges are similarly sealed using the hands, and the wearer inhales, forming a negative pressure as directed in the fitting instructions. A fit check ensures proper facepiece-to-face sealing and does not qualify as a fit test.

Fit Factor: 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: 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.)

Fit Testing: A quantitative assessment of the fit of a respirator, typically conducted using specialized equipment to measure airborne particle concentrations inside and outside the mask during simulated workplace activities.
Full-face Respirator

Fog: a mixture consisting of liquid particles dispersed in a gaseous medium.

Fume: solid aerosols formed by the reaction and condensation of a vapor or gas. Aerosols are minute solid particles arising from the heating of a solid body, such as steel, in distinction to a gas or vapor. The physical change is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce. Odorous gas and vapor should not be called fumes.

G

Gas: A state of matter in which the material has very low density and viscosity; can
expand and contract greatly in response to changes in temperature and pressure;
easily diffuse into other gases; readily and uniformly distributes itself throughout
any container.

H

Hazardous Atmosphere: an atmosphere that contains an airborne contaminant(s) in concentrations greater than the permissible exposure limit (PEL) or threshold limit value (TLV) or that is oxygen deficient.

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

High-Efficiency Particulate Air (HEPA) Filter: 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: a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

I

Immediately Dangerous to Life or Health (IDLH): 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.

I**nhalation Resistance**: The resistance encountered by the wearer when inhaling air through the respirator is affected by the filter media, valves, and overall design of the device.

Inhalation Valve: a one-way device that allows purified air to enter the facepiece.

J

K

L

Loose-Fitting Facepiece: a respiratory inlet covering designed to form a partial seal with the face.

Lower explosive limit (LEL): the lower limit of flammability of a gas or vapor at ordinary ambient temperatures expressed by a percentage of the gas or vapor in air by volume.

M

Maximum Use Concentration (MUC): 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.

Mist: an aerosol composed of suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, or atomizing. Mist is formed when a finely divided liquid is suspended in air.

N

National Institute for Occupational Safety and Health (NIOSH): a federal agency that tested approved, and certified respiratory protection equipment along with MSHA under the old 30 CFR Part 11 standard, NIOSH is now the sole source of approval under the new 42 CFR Part 84 standard.

Negative Pressure Respirator (Tight-Fitting): a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

O

OSHA: the Occupational Safety and Health Administration is a regulatory agency of the United States Department of Labor.

Oxygen-Deficient Atmosphere: an atmosphere with an oxygen content below 19.5% by volume.

P

Permissible Exposure Limit (PEL): adopted in OSHA regulations is a maximum allowable concentration of a contaminant in the air to which an individual may be exposed. These may be time-weighted averages (TWA), short-term limits (STEL), or ceiling (C) limits (see threshold limit value (TLV)).

Personal Protective Equipment (PPE): equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, coveralls, vests, and full-bodysuits.

Physician or Other Licensed Health Care Professional (PLHCP): 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: a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

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

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

Protection Factor:

- **ANSI—**The protection factor measures the degree of protection a respirator provides to the wearer when used correctly. It is the ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator.

- **OSHA—Assigned Protection Factor (APF):** the minimum anticipated protection provided a properly functioning respirator or class of respirators to a given percentage of properly fitted and trained users.

- **Simulated Protection Factor (SWPF)**—a surrogate measure of the workplace protection provided by a respirator. The protection factor is determined by quantitative measurement of a challenge agent inside a test hood or the ambient atmosphere particulate concentration (Co) divided by the particulate concentration measured inside the respirator (Ci); i.e., Co ÷ Ci = PPF.

- **Workplace Protection Factor (WPF)**—a measure of the protection provided by a properly functioning respirator when correctly worn and used.

Q

Qualitative Fit Test (QLFT): a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Test (QNFT): an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

R

Rainbow Passage: When the sunlight strikes raindrops in the air, they act as a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Regulatory Compliance: adherence to laws, regulations, guidelines, and specifications relevant to processes.

Resistance: the opposition to the flow of air, as through a canister, cartridge, or particulate filter.

Respirable Particles: airborne particles that are small enough to penetrate deep into the lungs upon inhalation, posing a risk to respiratory health, including dust, smoke, and aerosols.

Respirator: a personal device designed to protect the wearer from the inhalation of hazardous atmospheres.

Respirator Certification: the process by which respiratory protection equipment is tested and certified to meet specific performance standards set by regulatory agencies, such as the National Institute for Occupational Safety and Health (NIOSH) in the United States.

Respiratory Hazard: any particulate, gaseous, or vaporous airborne contaminant that can be inhaled into the lungs.

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

Respiratory Protection Equipment: a particular type of Personal Protective Equipment (PPE) used to protect the individual wearer against inhaling hazardous substances in the workplace air.

Sanitizing: the removal of dirt and inhibiting the action of agents that cause infection or disease.

Seal: the part of the respirator that touches the wearer's facial areas (near the nose and mouth for half-mask respirators and including around the eyes for full-facepiece respirators) that provides a gas or dust-tight seal to protect the user from outside contaminant(s).

Self-Contained Breathing Apparatus (SCBA): an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service Life: the period of time that a respirator, filter, sorbent, or other respiratory equipment provides adequate protection to the wearer.
Storage

Sorbent: a material that is contained in a cartridge and removes toxic gases and vapors from the inhaled air.

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

T

Tight-Fitting Facepiece: A respiratory inlet covering designed to form a complete seal with the face. A half-mask facepiece covers the nose and mouth, while a full-face facepiece covers the nose, mouth, and eyes.

Threshold Limit Value (TLV): exposure limits adopted and recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) (see Permissible Exposure Limit (PEL)).

Time Weighted Average (TWA): the average concentration of a chemical in air over the total exposure time - usually an 8-hour workday.

U

User: a Georgia Tech community member assigned tasks requiring respiratory protection and authorized to wear respiratory protective equipment through training and meeting specific physical and medical requirements.

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

V

Vapor: the gaseous form of a substance normally solid or liquid at room temperature and pressure. Liquids are changed into vapor and mixed with the surrounding atmosphere through evaporation.

Voluntary Respirator Users: employees have the option to wear a respirator in areas where it is not required under this policy or for compliance with state or federal OSHA regulations. Voluntary users of all respirator types (except dust masks) must comply with all program elements, including medical clearances.

W

Work Area: a room or defined space in a workplace where hazardous conditions are or may be produced or used and where users are present.

Workplace: an establishment, job site, or project at one geographical location containing one or more work areas.

X

Y

Z

N100 USE GUIDE

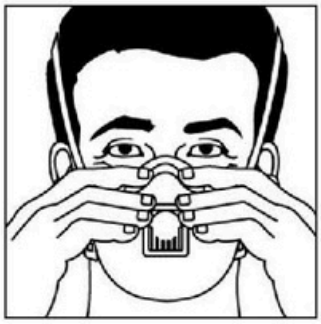
DONNING

Place the bottom elastic strap around the head, just below the ears.

Pull the top strap over your head, resting it above the ears at the top back of your head.

Adjust the strap tension by pulling the straps as shown. Strap tension may be decreased without removing respirator from the head by pushing out on the back of the buckle.

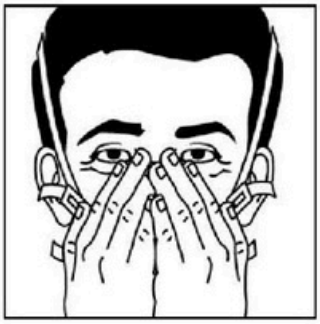
FITTING



Place your fingertips from both hands at the top of the metal nosepiece. Using two hands, mold the nose area to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece.

Pinching the nosepiece using one hand may result in improper fit and less effective respirator performance. Use two hands.

SEAL CHECK



Perform a Seal Check prior to each wear. To check the respirator-to-face seal, place both hands completely over the respirator and inhale sharply. Be careful not to disturb the position of the respirator. Negative pressure should be felt inside the respirator. If any leakage is detected, readjust.

DOFFING

Decrease strap tension. Cup respirator in hand to maintain position on face and pull bottom strap over head. Still holding respirator in position, pull top strap over head and remove respirator.

N100 RESPIRATOR GUIDE

REMINDERS

- ❑ DO NOT use for gases and vapors, oil aerosols, asbestos, or abrasive blasting
- ❑ DO NOT use for particulate concentrations exceeding 10X PEL/OEL
- ❑ DO NOT alter, abuse, or misuse the respirator
- ❑ Replace the respirator when it becomes dirty, damaged, or difficult to breathe through.
- ❑ Leave the contaminated area immediately and contact supervisor if dizziness, irritation, or other distress occurs.
- ❑ Store the respirator away from contaminated areas when not in use.
- ❑ Dispose of any respirator 5 years from the date of manufacture
- ❑ Store respirators in the original packaging, away from contaminated areas, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals
- ❑ Store in temperatures between -4°F (-20°C) and +86°F (+30°C) and not exceeding 80% Relative Humidity

3M CARTRIDGE & FILTER GUIDE

FREQUENTLY ASKED QUESTIONS

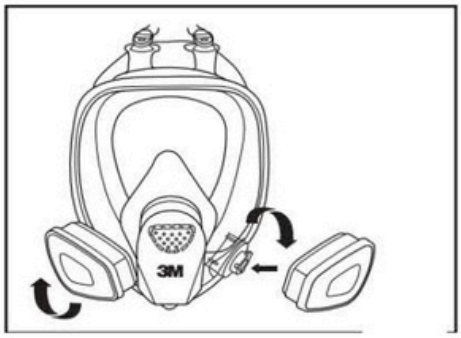
What is the shelf life of Cartridges?
Provided they are stored unopened in the original packaging and away from direct sunlight, humidity and sources of high temperature, cartridges will last five years from manufacture date. See "use by" date on packaging.

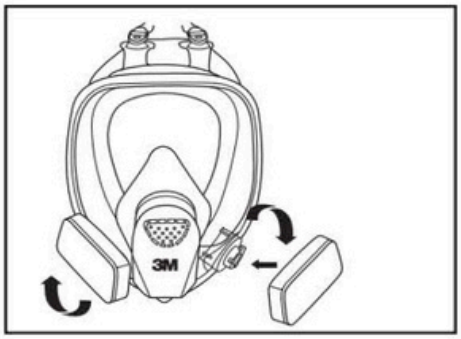
How should I store my Respirator Cartridges and Filters?
Prior to first use and when not in use, your 3M™ Respirator, Cartridges and Filters should be kept clean, cool and dry, away from contaminated atmospheres to avoid deterioration. Store cartridge in a sealed container or bag.

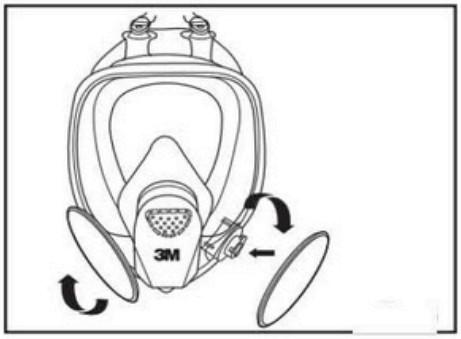
Why do I need to use a Particulate Filter with my Gas & Vapor Cartridges for some applications?
The particulate filter helps remove tiny droplets or particles in the air (e.g., mists from spray painting). The gas and vapor cartridges do not help filter these particles.

Can I wear a tight-fitting respirator with a beard?
No. OSHA requires respirator wearers be clean-shaven. Do not use a tight-fitting respirator with beards or other facial hair or other conditions that prevent a good seal between the face and the faceseal of the respirator.

Why are the filters and cartridges "pink"?
When a filter or cartridge has the magenta color code it has the P100 designation. This color provides uniformity and easy identification.







3M CARTRIDGE & FILTER GUIDE

TYPES OF CARTRIDGES & FILTERS

Particulate Filters
Filters only aerosols
(e.g., dust, mists, fumes, smoke, mold, bacteria, etc.).

Gas & Vapor Cartridges
Filters only gases & vapors.

Combination Cartridge/Filters
Filters particles, gases & vapors.

COLOR CODING CHEMICAL CARTRIDGES

6001	Organic Vapor	Black
6002	Acid Gases	White
6003	Organic Vapor/Acid Gases	Yellow
6004	Ammonia/Methylamine	Green
6005	Formaldehyde/Organic Vapor	Olive/Black
6006	Multi-Gas/Vapor	Olive
6009	Mercury Vapor/Chlorine Gas	Orange

WHEN TO REPLACE CARTRIDGES & FILTERS

How long any gas and vapor cartridge last is affected by many factors such as the: contaminant, contaminant concentration, breathing rate, humidity level, temperature and other use conditions.

To avoid using your Gas & Vapor Cartridges beyond their service life, take the following steps:

- Before use, check the expiration date printed on the package of your 3M™ Gas & Vapor Cartridges.
- Write the date on the cartridges when first removed from the pack.
- Change in accordance with your established cartridge change schedule.
- **IF AT ANY TIME** you smell or taste the contaminant or irritation is detected, leave the contaminated area immediately and try adjusting your respirator and/or change the respirator cartridges.

AND/OR

- **IF AT ANY TIME** it because more difficult to breathe

To help establish how frequently cartridges should be replaced, visit 3M.com/ServiceLifeSoftware to access **3M™ Service Life Software**.

MY FILTER/CARTRIDGE & CHANGE SCHEDULE IS:

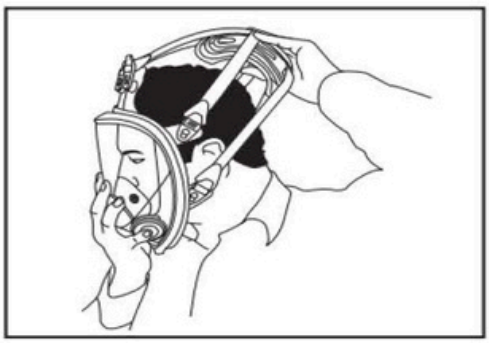
DAILY INSPECTION GUIDE

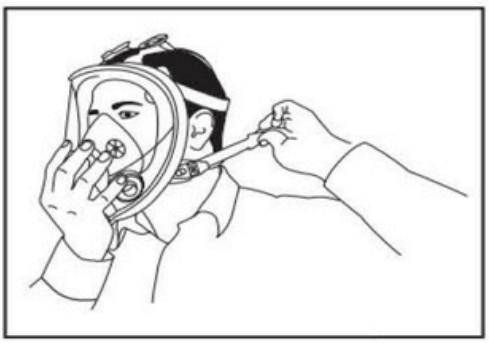
BEFORE EACH USE

- ❑ Ensure no parts are missing.
- ❑ Check that all part and areas of the respirator are free of damage.
- ❑ Filter/cartridge is adequate for contaminant
- ❑ Check cartridge expiration date, if out of date replace.
- ❑ Filter/cartridge is in place (wear gloves if installing previously used filter)

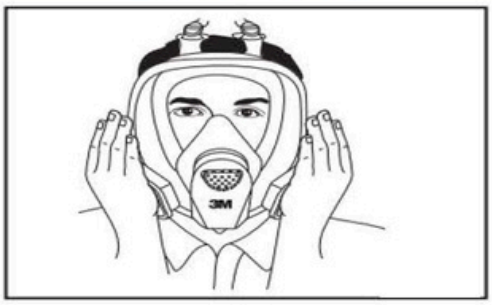
DONNING

- ❑ Respirator should be donned before any other PPE that might interfere with the seal





SEAL CHECK



1. Positive Pressure User Seal Check

Place the palm of your hand over the exhalation valve cover and *exhale* gently. The facepiece should bulge slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.

2. Negative Pressure User Seal Check

Place your thumbs over the center of the filters and *inhale* gently. The respirator should collapse slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.

Place the palms of your hands over the cartridges and *inhale* gently. The facepiece should collapse slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.

3M FULL-FACE CARE GUIDE

CLEANING RESPIRATOR

- ❑ Cleaning is recommended after each use. Nitrile or vinyl gloves should be worn during cleaning as well as other personal protective equipment (PPE) as indicated.
- ❑ Remove any filters or cartridges. The facepiece may be further disassembled as necessary.
- ❑ Inspect the facepiece to identify any damage or excessive wear.
- ❑ Manually clean the facepiece by immersing it in warm water not to exceed 120°F (49°C), and scrub with soft brush until clean. Add neutral detergent. Do not use cleaners containing lanolin or other oils. **NOTE: Solvents and strong detergents may damage 3M facepieces and should not be used for cleaning**
- ❑ Rinse thoroughly with fresh warm water.
- ❑ Air dry in a non-contaminated area.
- ❑ Disinfect by soaking, wiping or spraying the facepiece according to the user instructions for the selected disinfectant, including application and contact time.

STORAGE

- ❑ Store your respirator in a clean, contaminate free container like a freezer ziplock bag.
- ❑ Then place the entire unit into a strong cloth bag or container.
- ❑ Always store a dirty mask in a separate bag/container.

3M CARTRIDGE & FILTER GUIDE

FREQUENTLY ASKED QUESTIONS

What is the shelf life of Cartridges?
Provided they are stored unopened in the original packaging and away from direct sunlight, humidity and sources of high temperature, cartridges will last five years from manufacture date. See "use by" date on packaging.

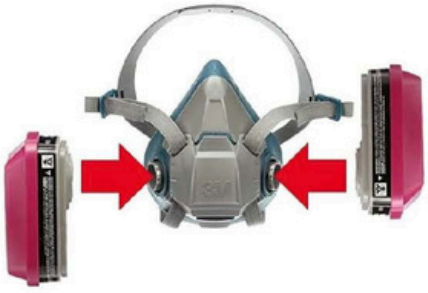
How should I store my Respirator Cartridges and Filters?
Prior to first use and when not in use, your 3M™ Respirator, Cartridges and Filters should be kept clean, cool and dry, away from contaminated atmospheres to avoid deterioration. Store cartridge in a sealed container or bag.

Why do I need to use a Particulate Filter with my Gas & Vapor Cartridges for some applications?
The particulate filter helps remove tiny droplets or particles in the air (e.g., mists from spray painting). The gas and vapor cartridges do not help filter these particles.

Can I wear a tight-fitting respirator with a beard?
No. OSHA requires respirator wearers be clean-shaven. Do not use a tight-fitting respirator with beards or other facial hair or other conditions that prevent a good seal between the face and the faceseal of the respirator.

Why are the filters and cartridges "pink"?
When a filter or cartridge has the magenta color code it has the P100 designation. This color provides uniformity and easy identification.

Bayonet compatibility allows use with many 3M half and full facepiece designs



3M CARTRIDGE & FILTER GUIDE

TYPES OF CARTRIDGES & FILTERS

Particulate Filters
Filters only aerosols
(e.g., dust, mists, fumes, smoke, mold, bacteria, etc.).

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Filters only gases & vapors.

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Filters particles, gases & vapors.

COLOR CODING CHEMICAL CARTRIDGES

6001	Organic Vapor	Black
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6004	Ammonia/Methylamine	Green
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6006	Multi-Gas/Vapor	Olive
6009	Mercury Vapor/Chlorine Gas	Orange

WHEN TO REPLACE CARTRIDGES & FILTERS

How long any gas and vapor cartridge last is affected by many factors such as the: contaminant, contaminant concentration, breathing rate, humidity level, temperature and other use conditions.

To avoid using your Gas & Vapor Cartridges beyond their service life, take the following steps:

- Before use, check the expiration date printed on the package of your 3M™ Gas & Vapor Cartridges.
- Write the date on the cartridges when first removed from the pack.
- Change in accordance with your established cartridge change schedule.
- **IF AT ANY TIME** you smell or taste the contaminant or irritation is detected, leave the contaminated area immediately and try adjusting your respirator and/or change the respirator cartridges.

AND/OR

- **IF AT ANY TIME** it because more difficult to breathe

To help establish how frequently cartridges should be replaced, visit 3M.com/ServiceLifeSoftware to access **3M™ Service Life Software**.

MY FILTER/CARTRIDGE & CHANGE SCHEDULE IS:

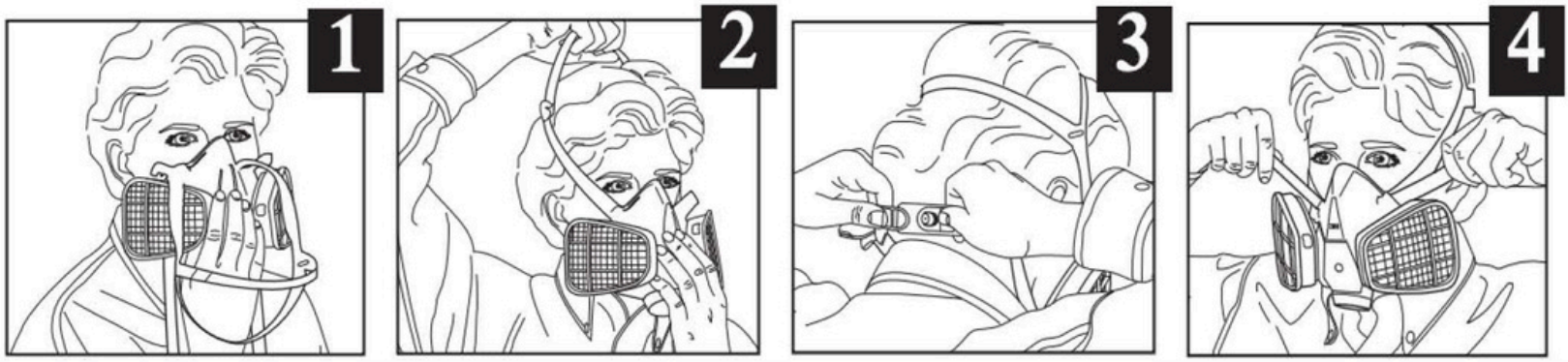
DAILY INSPECTION GUIDE

BEFORE EACH USE

- ❑ Ensure no parts are missing.
- ❑ Check that all part and areas of the respirator are free of damage.
- ❑ Filter/cartridge is adequate for contaminant
- ❑ Check cartridge expiration date, if out of date replace.
- ❑ Filter/cartridge is in place (wear gloves if installing previously used filter)

DONNING

- ❑ Respirator should be donned before any other PPE that might interfere with the seal.



SEAL CHECK

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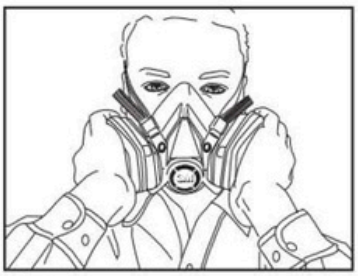
Place the palm of your hand over the exhalation valve cover and *exhale* gently. The facepiece should bulge slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.



2. Negative Pressure User Seal Check

Place your thumbs over the center of the filters and *inhale* gently. The respirator should collapse slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.

Place the palms of your hands over the cartridges and *inhale* gently. The facepiece should collapse slightly. If air leaks between the face and the faceseal of the respirator, reposition it and adjust the straps for a more secure seal. If you cannot achieve a proper seal, **do not** enter the contaminated area. See your supervisor.

3M CARE GUIDE

CLEANING RESPIRATOR

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- ❑ Rinse thoroughly with fresh warm water.
- ❑ Air dry in a non-contaminated area.
- ❑ Disinfect by soaking, wiping or spraying the facepiece according to the user instructions for the selected disinfectant, including application and contact time.

STORAGE

- ❑ Store your respirator in a clean, contaminate free container like a freezer ziplock bag.
- ❑ Then place the entire unit into a strong cloth bag or container.
- ❑ Always store a dirty mask in a separate bag/container.

North® CARTRIDGE & FILTER GUIDE

FREQUENTLY ASKED QUESTIONS

What is the shelf life of Cartridges?
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Why are the filters and cartridges "pink"?
When a filter or cartridge has the magenta color code it has the P100 designation. This color provides uniformity and easy identification.

North® CARTRIDGE & FILTER GUIDE

TYPES OF CARTRIDGES & FILTERS

Particulate Filters
Filters only aerosols
(e.g., dust, mists, fumes, smoke, mold, bacteria, etc.).

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6005	Formaldehyde/Organic Vapor	Olive/Black
6006	Multi-Gas/Vapor	Olive
6009	Mercury Vapor/Chlorine Gas	Orange

WHEN TO REPLACE CARTRIDGES & FILTERS

How long any gas and vapor cartridge last is affected by many factors such as the: contaminant, contaminant concentration, breathing rate, humidity level, temperature and other use conditions.

To avoid using your Gas & Vapor Cartridges beyond their service life, take the following steps:

- Before use, check the expiration date printed on the package of your 3M™ Gas & Vapor Cartridges.
- Write the date on the cartridges when first removed from the pack.
- Change in accordance with your established cartridge change schedule.
- **IF AT ANY TIME** you smell or taste the contaminant or irritation is detected, leave the contaminated area immediately and try adjusting your respirator and/or change the respirator cartridges.

AND/OR

- **IF AT ANY TIME** it because more difficult to breathe

MY FILTER/CARTRIDGE & CHANGE SCHEDULE IS:

North® CARE GUIDE

CLEANING RESPIRATOR

- ❑ Before cleaning, remove the filters and cartridges. Getting them wet would damage them.

- ❑ Use the Honeywell Shockwave cleaner and disinfectant PN: 80995-H5 to sanitize and disinfect respirators; however, if you prefer to make your own solution, mix 10 parts water and one part bleach solution to disinfect.

- ❑ Spray the solution on the respirator and then wipe it down with a lint-free cloth. Submersion is also an option to clean the mask. However, make sure the water is not above 100F, as it will deform the respirator.

- ❑ After washing, rinse off the mask with clean water and completely dry it via air drying or drying with a lint-free cloth.

- ❑ Prior to putting on the filters/cartridges inspect the mask. Make sure the mask is fully dry. Putting filters on when the mask is wet will damage and hinder their use.

STORAGE

- ❑ Store your respirator in a clean, contaminate free container like a freezer ziplock bag.

- ❑ Then place the entire unit into a strong cloth bag or container.

- ❑ Always store a dirty mask in a separate bag/container.

- ❑ With in your respirator maintenance kit, always keep an ample supply of alcohol wipes and wet naps. These can be used for minor cleaning at the end of a light day's usage.

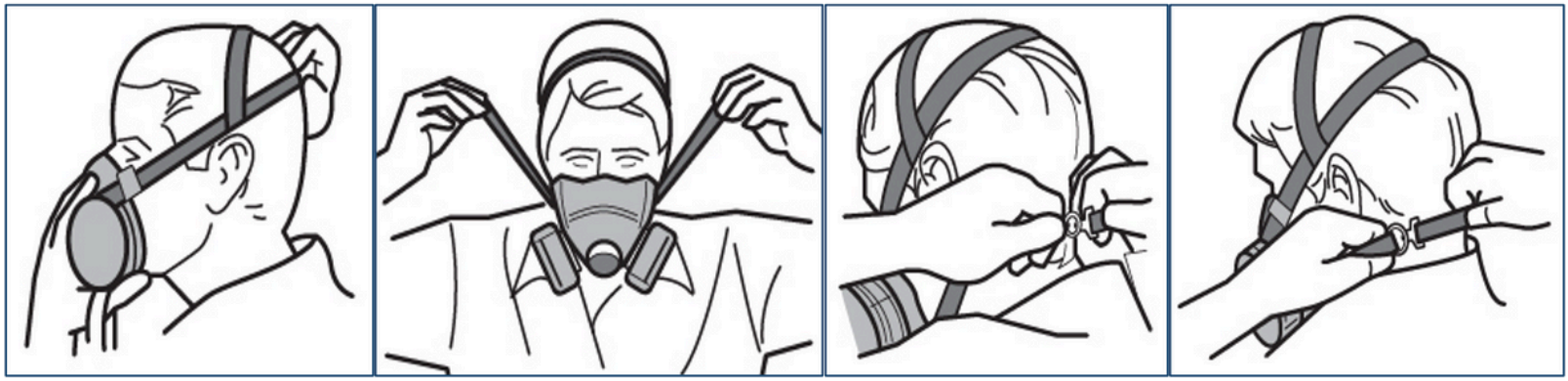
North® DAILY INSPECTION GUIDE

BEFORE EACH USE

- ❑ Ensure no parts are missing.
- ❑ Check that all part and areas of the respirator are free of damage.
- ❑ Filter/cartridge is adequate for contaminant
- ❑ Check cartridge expiration date, if out of date replace.
- ❑ Filter/cartridge is in place (wear gloves if installing previously used filter)

DONNING

- ❑ Respirator should be donned before any other PPE that might interfere with the seal.



SEAL CHECK

Negative pressure seal check

Positive pressure seal check

PAPR Daily Inspection

BEFORE EACH USE

- ❑ Helmet/hood, breathing tube, and/or fittings are free of damage and correct for the pump being used (must be same manufacturer)
- ❑ Filter/cartridge is adequate for contaminant
- ❑ Check cartridge expiration date, if out of date replace.
- ❑ Filter/cartridge is in place (wear gloves if installing previously used filter)
- ❑ Air flow is adequate (typically 6 CFM)

DONNING PAPR & IN-USE PROCEDURE

- ❑ Fittings and connections are tight, and hose is not leaking
- ❑ Air flow is adequate (6 CFM)
- ❑ PAPR is turned on **BEFORE** entering exposure area
- ❑ Exit area then check battery if a variance in airflow or motor sound is noticed

DOFFING PAPR

- ❑ Clean or wipe down the exterior surface while the PAPR still being worn BEFORE the PAPR is removed from the immediate area (if possible)
- ❑ PAPR may then be removed, and must be cleaned outside of the hazard area within a dedicated area
- ❑ **Do NOT take PAPRs to a clean area, such as an office, this will spread contaminants**

PAPR Cleaning & Maintenance

CLEANING

- ❑ Disconnect all component parts of PAPR
- ❑ Blower unit AND all its component parts (blower/filtration unit, battery, breathing tube, and hood/helmet) must be cleaned & disinfected
- ❑ Use a mild cleaning solution or disinfectant cleaning wipes (70% isopropyl alcohol) to wipe down all parts
- ❑ Do **NOT** submerge the battery, blower/filtration, or hood/helmet in liquid (unless unit comes with appropriate inlet and outlet plugs and the battery strap)

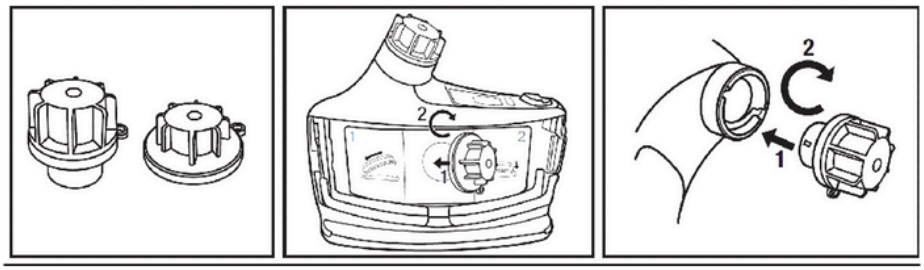


Figure 1. *Installing the inlet and outlet plugs from the TR-653 Cleaning and Storage Kit*

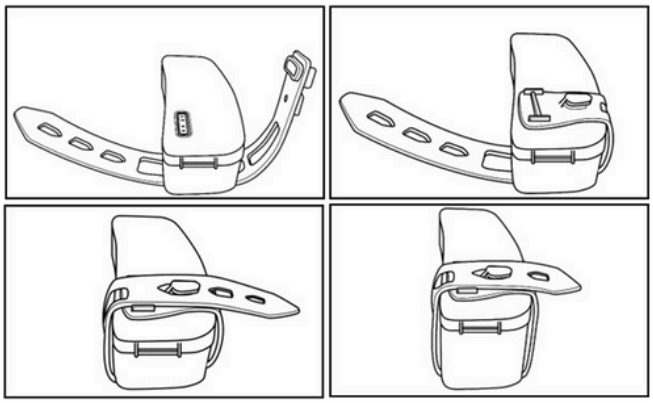


Figure 2. *Installing the battery strap from the TR-653 Cleaning and Storage Kit*

- ❑ Do **NOT** clean filters/cartridges
- ❑ Dispose of filters/cartridges after service life has expired. Special steps may be required (e.g., for infectious exposures, perform change-out in a BSC)

STORAGE

- ❑ **AFTER** disinfection and drying, store on shelf in cool, dry, dark area, out of sunlight

PAPR Cleaning & Maintenance

CLEANING

- ❑ Disconnect all component parts of PAPR
- ❑ Blower unit AND all its component parts (blower/filtration unit, battery, breathing tube, and hood/helmet) must be cleaned & disinfected
- ❑ Use a mild cleaning solution (dish soap) or previously stated Recommended Agents (70% Isopropyl Alcohol, ethanol or hydrogen Peroxide) as per brand manufacturer's instructions as per the cleaning solution product manufacturer instructions, and a lint-free cloth or sponge
- ❑ Do **NOT** submerge the battery, blower/filtration, or hood/helmet in liquid
- ❑ Clean the outside of the breathing tube then rinse the outside of the breathing tube in clean water. Take care to avoid getting any water or particulates inside the breathing tube. If liquid should get inside the breathing tube, make sure it is thoroughly cleaned and dried before using it with the PAPR
- ❑ Clean the harness and comfort pad
- ❑ Clean the blower assembly and the battery taking care not to get cleaning solution or water near the air-inlet, battery connector terminals and contacts or the gasket.
- ❑ Clean the headcovers/hoods
- ❑ Dry all components and the exterior of the breathing tube with a clean, lint-free cloth and/or leave to air dry in a clean environment free of dust and particles. Make sure components are completely dry before putting the PAPR respirator back into service.

PAPR Cleaning & Maintenance

HONEYWELL NORTH PA700 PARTS & FEATURES

Side-Mounted Battery
Contained in housing on five (5) sides and locks into place to reduce accidental disconnections.

Adjustable Airflow
Three air speeds to enhance user comfort.

Three Alarms —visual, audio, and vibratory
Keeps workers safer with intuitive low battery and low airflow notifications.

Smart Breathing Tube Connection
Twist-and-lock connector angles the tube away from the back; automatically detects between tight- and loose-fitting hoses and adjusts the airflow accordingly.

Configurations with tight-fitting facepieces are pending NIOSH approval.

Efficient Keypad
Illuminated, easy-to-read display; large buttons for easy operation —even when wearing gloves.

Ergonomic Belt
Carefully chosen shape and materials distribute the weight of the PAPR and help keep it from slipping.

Adjustable Straps
Adjust for customized fit; available in standard industrial nylon or easy-to-clean PVC.

Comfort Pad
Rests on lower back and cushions impact for all-day use.

Lightweight Breathing Tubes
Highly flexible, corrugated hose; 360° swivel connector on straight hose allows freedom of movement with twisting.

Optional Filter Cover
Protects the filter from impacts and during decontamination showers; smooth design is easy to wipe clean.

Cartridge/Filter Connection
Allows filter or cartridge/filter combination to lock into place with a quarter turn, assuring workers they are secure and safer.

The Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Facial Hairstyles and Filtering Facepiece Respirators

Intended for workers who wear tight-fitting respirators

CLEAN SHAVEN ✓

STUBBLE ✗

LONG STUBBLE ✗

FULL BEARD ✗

FRENCH FORK ✗

DUCKTAIL ✗

VERDI ✗

GARIBALDI ✗

BANDHOLZ ✗

SOUL PATCH ✓

GOATEE ✓
(Careful! Chin hair may easily cross the seal)

CHIN CURTAIN ✗

EXTENDED GOATEE ✗

CIRCLE BEARD ✗

ANCHOR ✓ BALBO ✓
(Careful! Chin hair may easily cross the seal)

VAN DYKE ✗

IMPERIAL ✗

SIDE WHISKERS ✓

MUTTON CHOPS ✗

HULIHEE ✗

HORSESHOE ✓
(Careful not to cross the seal)

ZAPPA ✓

WALRUS ✓

PAINTER'S BRUSH ✓

CHEVRON ✓

HANDLEBAR ✓

PENCIL ✓ ✓

LAMPSHADE ✓

ZORRO ✓

VILLAIN ✓
(Careful not to cross the seal)

WET NOODLE ✗

ENGLISH ✗

DALI ✗

*If your respirator has an exhalation valve, some of these styles may interfere with the valve working properly if the facial hair comes in contact with it.
*This graphic may not include all types of facial hairstyles. For any style, hair should not cross under the respirator sealing surface.
Source: OSHA Respiratory Protection Standard
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=12716
Further Reading: NIOSH Respirator Trusted-Source Webpage
https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource3fittest.html

Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

2017