Respiratory Protection Newsletter July 2022

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Featured Courses:
- **Overview of Respiratory Protection:** October 18, 2022
- **2-day Respirator Fit Testing Workshop:** October 19-20, 2022 (2 spots available)

New Features Added to **QualFit™ Software**
The following new features were recently added to **QualFit™ Software**.

### Export Data File - Subjects Previously Tested & Due Dates
Why would you do this? Management may want a list of employees fit tested last year, last month, this year, etc. Or, it may be mid-way through the current month and you want a listing of employees who have fit tests due next month. Identifying employees with fit tests about to expire, can assist with scheduling of employees. QualFit™ software makes this easy, saves time, and helps maintain compliance with the requirement for annual fit testing, when applicable.

### Signature Lines
Another new feature is an option to add employee and/or operator signature lines at the bottom of the printed report. The employee name always appears at the top of the report, along with ID, company, location, test date and test time. However, when the employee signature line option is enabled, the employee name appears a 2nd time at the bottom of the report with a line for their signature. When the operator signature line is enabled, a horizontal signature line appears next to the operator’s name, at the bottom of the report. Signature lines can be easily turned on or off as a default setting.

Combine these two new features with the “Full Screen” testing option and Windows 11 compatibility added in 2021, and it’s easy to see how **QualFit™ Software** makes respirator fit testing easier, more reliable, and saves time with OSHA record keeping requirements.

For Information visit: [www.QualFit.net](http://www.QualFit.net)
Airborne Transmissible Diseases - By the Numbers

The April and May issues of the AIHA publication *The Synergist*, report staggering numbers for three of the more common airborne transmissible diseases each year in the United States and globally. Here are the reported numbers:

1,700,000,000
1.7 Billion people infected globally in 2018 by *Mycobacterium tuberculosis*, the bacterium that causes tuberculosis (TB). Source: February 2022 report by the National Academies of Sciences, Engineering, and Medicine (refer to the article that follows).

13,000,000
Estimated number of people in the U.S. with latent TB infections.

1,500,000
1.5 Million deaths per year. Approximate number of TB-related deaths reported globally each year as reported by the CDC.

526
Number of deaths from TB reported in the United States for calendar year 2021.

1,000,000,000
1.0 Billion estimated number of influenza cases reported globally every year according to the World Health Organization (WHO).

4,000,000
Estimated number of severe influenza cases (3-5 million) reported globally every year.

290,000 - 650,000
Estimated number of influenza-related deaths globally per year. Based upon my math, fatalities range between 0.03 and 0.07% of cases reported.

435,626,514
Cumulative number of confirmed cases of COVID-19 reported by the WHO, as of March 1, 2022. Obviously much higher now.

5,952,215
Cumulative number of COVID-19 deaths reported to the WHO as of March 1, 2022. Based upon my math, this represents 1.37% of confirmed cases.

Dr. McKay’s Comment:
Think about these numbers. They’re truly earth-shattering. Maybe it’s time to re-think green, energy efficient buildings from a health perspective. For example, last year I had an opportunity to speak at a modern, energy-efficient, federally awarded green building. The risk for COVID was still a concern, but it wasn’t possible to switch the ventilation fan to the “on” position (it stayed set to “auto”). Furthermore, I couldn’t change the fan speed from low-to-high and couldn’t open any windows. Other control measures were put in place, such as physical distancing, face coverings, etc., but it would have been desirable to improve ventilation. I gave my presentation wearing an N95 filtering facepiece respirator (FFR).

Recently (late June), I returned from Europe on a 3-legged flight. Face coverings were not required on any of the flights. On the 2nd (transoceanic) and 3rd (U.S. domestic) flights, I felt very comfortable and choose not to wear my N95 filtering facepiece respirator (FFR). For these two legs, I was fortunate to have premium seating. However, on the 1st leg of this adventure, the ventilation felt stagnant, especially during boarding. For this plane, seating was a 3 by 3 configuration in the main cabin and all seats were occupied. I didn’t make a count, but rarely observed anyone wearing a face covering and coughing was heard periodically throughout the 2-hour flight. During this flight, everyone generally stayed in their seats and I wore my N95 FFR. However, none of these scenarios appeared as “risky” as time between flying. For the connecting flight in Europe, everyone was transferred from the terminal using buses. These buses were standing room only and sat on the tarmac for extended periods on time. Standing shoulder-to-shoulder, packed like sardines; talking, laughing, coughing, and sneezing were all common occurrences.

Next, I entered passport control. Here the lines were extensive. Everyone was packed into what appeared to be a very poorly ventilated holding area with low ceilings. The room was hot and humid, and became worse over time. The increasing heat and humidity were obviously due to high occupancy in a poorly ventilated space. As the slowly moving lines of people switched back-and-forth, there was ample opportunity to share your space with people from other flights. While not exactly standing shoulder-to-shoulder, the spacing was tight, and became tighter as the lines grew longer. A true, international experience in a poorly ventilated area.

The next opportunity to share space was while
taking the tram to another terminal for my departing flight. At first, the tram wasn’t crowded, but then the masses arrived and became progressively more crowded. I questioned, why the tram didn’t depart earlier. My guess is the tram must be able to count people. If the tram can comfortably hold 25 people, apparently, the doors don’t close until the count exceeds 150. Once again, I found myself in a poorly ventilated, over-crowed space, standing shoulder-to-shoulder with friends around the world.

In summary, it appeared the risk of airborne transmission on the plane was much lower than the risk of air “travel”. Next time you consider the safety of traveling on a plane, you may want to pay more attention to the over-crowed, poorly ventilated spaces on the ground before stepping onto the plane. My decision to selectively use respiratory protection was my choice. However, I would have preferred better options.

Proposed Expansion of Respiratory Protection to the Public

In a 152 page report released on February 10, 2022, by the National Academy of Sciences, Engineering, and Medicine (NASEM), they recommend extending respiratory protection to the general public and to workers not currently covered by OSHA requirements. Initially developed in response to the COVID-19 pandemic, the committee addressed concerns related to other inhalation hazards, such as ambient air pollution, wildfire smoke, biological, chemical, and radioactive agents. Information from the report was used for the article above regarding the burden of respiratory disease due to airborne transmissible of biological agents.

The NASEM report suggests a new, expanded regulatory approach for the development, approval, and use of respiratory protection for the public and unprotected workers. To accomplish this, they suggest development of two "coordinating entities". One for workers and another for the public. For workers, OSHA would continue it’s activity, but the OSHA Act would be expanded to include workplaces not currently covered by the OSHA Act. The coordinating entity for the public, would be established within the Department of Health and Human Services. The report states this entity, would have the capability to oversee the development of standards for respiratory protection and the approval of respiratory protective devices for the public. This would require establishment of a laboratory similar to NIOSH’s National Personal Protective Technology Laboratory (NPPTL).

A paperback version of the report is available for $68, an ebook for $55, or a downloadable PDF version is available for free. To obtain a copy, regardless of format, register with the National Academies Press website at bit.ly/nas-resp-frwk or Click Here.

Let’s Think About This:
Should You Trust Respirator Fit Testing Research Without Photos?

In a previous issue of this Newsletter I expressed how difficult it is to believe results of published respirator research, even when peer reviewed. This is especially true for research conducted on N95 filtering facepiece respirators (FFRs) during COVID. Rarely are photographs provided when submitting a manuscript for publication. However, when photographs are provided they often reveal significant mistakes in respirator donning, probing, and/or use of fit testing equipment, both qualitative and quantitative. I remind readers to be cautious. I’ve read too many peer-reviewed articles from well-known academic institutions, where the respirator fit testing wasn’t conducted correctly. Unfortunately, this occurs too many times, especially with COVID related research where anything with the word “COVID” gets published.

The problem is:
How can you compare respirator fit when the fit testing equipment isn’t used correctly?

For example, in one publication, a photograph reveals the twin tubing for a TSI PortaCount was removed and replaced with single tubing. The ambient sample was taken next to the PortaCount rather than near the breathing zone of the person wearing the N95 FFR. This was one of seven (7) fit testing errors I identified from a single photograph, and it wasn’t even the most egregious error.

How can you compare fit when the number of subjects can be counted on one hand?
How can you compare fitting characteristics when the facepiece is donned only one time?

How can you compare the fit of respirators and face coverings when they’re not donned correctly?

If ten (10) bad studies are published with results that conflict with a good study, what happens? Does the single good study get dismissed as an outlier? Does the next researcher cite references from these bad studies, thinking they’re true?

Anyone can purchase fit testing equipment and learn how to press the start button or squeeze a nebulizer bulb. You may read an article from an outstanding researcher, but it’s unlikely this person administered the fit testing.

So far, the photographic evidence I’ve seen, suggests fit testing for respirator research is frequently done incorrectly. Imagine what it’s like when photographs are not available? From my perspective, photography and video would help weed-out poorly conducted testing.

However, I do what to THANK those who unknowingly publish photographs of their mistakes. It makes for great training material. To my readers, please continue to send photos and videos of improperly conducted fit testing.

Note: “Let’s Think About This” is intended to provide readers information “outside the box” of traditional thinking. The content may at times be funny, light-hearted, spirited or identify unusual observations. It’s tongue and cheek and doesn’t necessarily represent the views of Dr. McKay.

Anti-fogging Solutions for Respirators

Fogging of eyewear during respirator use ranges from annoying to a potential safety hazard. Therefore, the first step to prevent fogging is to understand the most common causes. Inside the lung, the air is warm and saturated with water vapor. During exhalation, if this warm, saturated air makes contact with a cooler surface, such as safety glasses or ordinary eyewear, it condenses onto the surface and fogs the lens. In the case of a full facepiece respirator, if the exhaled breath makes contact with the facepiece lens, “fogging” will likely occur. However, exhaled breath is not the only source of warm, moist air. Another source is evaporation of water from the skin surfaces around the eyes and face. This is especially true during increased levels of physical exertion. Warm moist air rises. As a result, this upward moving warm air can make physical contact with various forms of eyewear and condense. While it’s true, that a poor fitting facepiece, especially one that fits poorly around the nose is a common cause of lens fogging, moisture laden from other locations can also move upward and condense onto surfaces. Keep in mind, a NIOSH approved particulate filter is not designed to prevent water vapor from passing through the filter material. As a result, this upward moving, warm, saturated air can cause fogging even when an acceptable seal to the face is made. Sometimes, a potentially good fitting N95 filtering facepiece respirator (FFR) is rejected because the wearer inadvertently directs moisture laden air upward during seal check procedures causing fogging. If he/she is being “fitted” by an inexperienced fit tester, they may not recognize the true source of the problem. Solutions to this fogging problem are available. For example, some manufacturers of FFRs have respirator designs that deflect air movement and/or use materials that prevents air from moving through facepiece material directly under the eyes.

Another cause of fogging is simply moving between warm and cold air environments. Changes in temperature and/or humidity levels can be problematic and unavoidable for some workers.

A dirty lens can also contribute to fogging. Moisture can condense onto small particles. This is a common problem with a dirty windshield, which contributes to fogging when driving. Cleaning the interior of the windshield helps keep it clear. The same could be true for protective eyewear and eye glasses. On the other hand, while it’s important to keep eyewear clean, it may also remove anti-fog coatings applied by the manufacturer.

Fortunately, technology is beginning to resolve many fogging problems. Anti-fog agents are improving on a regular basis and are available as creams, sprays, and wipes. Better yet are anti-fog materials applied by the manufacturer of safety glasses and other types of lenses. These are often nearly permanent solutions to the fogging problem, as long as the user doesn’t damage the protective coating using un-approved cleaning agents that damage the protective coating.

With respect to manufacturer lens treatments, some are hydrophobic, which means water repelling. These have been the traditional approach used by manufacturers. In recent years, hydrophilic, anti-fog coatings have been developed. These water loving nano-technology coatings, often work very well. The concept of water repelling and water loving approaches can both be effective. The newer
hydrophilic coatings often have a longer lifetime and better resilience to routine cleaning. Of course, it’s important to follow manufacturer recommended cleaning procedures.

At this time, nothing is perfect, but understanding the causes of fogging, using proper cleaning agents and improvements in technology, can make fogging less common. Proper training can be very beneficial. Something as simple as not exhaling directly onto the lens surface during donning can make an impact.

**Respirators for Pesticides**

This is a good time of year to think about respiratory protection and regulatory requirements for pesticide exposure. As a reminder, three (3) federal agencies have regulatory requirements when respirators are used with pesticides. They are NIOSH, OSHA, and the EPA. When a respirator is specified by product labeling to be worn, it will identify the type of respiratory protective equipment consistent with how the pesticide is to be applied by the user. This greatly enhances the previously difficult problem of respirator selection. So a key concept is to apply the pesticide in the manner in which it has been approved. With respect to the respirator, use only respirators approved by the National Institute of Occupational Safety and Health (NIOSH).

Information regarding the type (selection) of respirator to be worn is found in the “Precautionary Statements” section of the pesticide label. If two or more pesticides are used at the same time, you must use the type of respirator identified on the most restrictive label. If a pesticide product label has “Agricultural Use Requirements” language referring to EPA’s Worker Protection Standard (WPS), you must follow the WPS requirements for respirator training, medical evaluation, fit testing, and record keeping. Keep in mind that WPS 40 CFR 170.507 Personal Protective Equipment (b)(10)(I) through (iii) incorporates some of OSHA’s Respiratory Protection Standard [29 CFR 1910.134] by reference.

For basic information regarding respirators used for handling pesticides, consider the 48 page guide provided by the Pesticide Educational Resources Collaborative, titled Requirements for Employers of Pesticides Handlers. Not only does it provide a good overview of the Worker Protection Standard, but it’s free. To obtain a copy use the following URL: https://pesticideresources.org/wps/hosted/PERC-WPS-Respirator-Guide.pdf

Or, just Click Here

**Estimating the Number of N95 FFRs Needed for the Next Pandemic**

Curious as to how many N95 filtering facepiece respirators (FFRs) will be need for the next infectious disease pandemic? Read this modified abstract from a study published online in Health Security by Ethan D. Fechter-Leggett, et. al.

Early in the COVID-19 pandemic, demand for N95 FFRs far exceeded the supply, leading to widespread shortages. Initially, the CDC did not recommend N95 respirators in non-healthcare settings, in order to reserve them for healthcare workers. As N95s became more available, the recommendations were updated in May 2021 to include N95 respirators for non-healthcare settings. In this study, we estimated the numbers of N95s needed for non-healthcare essential workers in the United States. We modeled minimum, intermediate, and maximum N95 provision scenarios (as 1, 2, and 5 N95 respirators, respectively) per week per worker, for pandemic durations of 15 and 40 weeks. For 85.15 million nonhealthcare essential workers during a 15-week pandemic, an estimated 1.3 billion N95 respirators would be needed under minimum provision scenarios, 2.6 billion for intermediate provision, and 6.4 billion for maximum provision. During a 40-week pandemic, these estimates increased to 3.4 billion, 6.8 billion, and 17 billion.

Source: Published Online:22 Apr 2022
https://doi.org/10.1089/hs.2021.0166

Estimated N95 Respirator Needs for Nonhealthcare Essential Workers in the United States During Communicable Respiratory Infectious Disease Pandemics
Ethan D. Fechter-Leggett, et. al.

To view this publication use this URL: https://www.liebertpub.com/doi/full/10.1089/hs.2021.0166
Or, Click Here
Face Mask Use Among Athletes - No Significant Physiologic Effect

On March 22nd, the American Academy of Orthopaedic Surgeons (AAOS) released a statement from a study presented at their 2022 annual meeting. Referring to a study by Drs. Carter & Lott, the authors identified studies that described the effects of mask use that covered the nose and mouth on any sport/exercise/physical activity for any age, gender, or level of sport. They identified 22 articles that met their inclusion criteria. These articles included studies on healthy adult volunteers, high-level athletes, children, pregnant women, and patients with a variety of pulmonary co-morbidities including asthma and chronic obstructive pulmonary disease (COPD). Analysis of these studies revealed that healthy persons can perform moderate to vigorous exercise while wearing unspecified face masks without experiencing significant changes in heart rate, respiratory rate, and oxygen saturation. Of the studies that investigated N95 filtering facepiece respirators (FFRs) among healthy adult populations, two (2) reported changes in respiratory rate (up 10 breathes per minute at maximum exercise) and maximum power output, indicative of decreased athletic performance when exercising at maximum effort.

Dr. McKay’s Comment:
When the AAOS concluded adults can perform moderate to vigorous exercise while wearing unspecified face masks without experiencing significant changes in heart rate, respiratory rate, and oxygen saturation, this was based upon healthy persons. Most of us in the respirator community were already aware of this. Just look at the number of people wearing face masks at your local exercise facility. It’s unfortunate the researchers didn’t draw conclusions for persons with pulmonary co-morbidities (asthma and COPD), since these individuals met their inclusion criteria. Perhaps more is coming. In the interim, it’s good to have a study conclude that healthy individuals can perform heavy exercise wearing masks with minimal physiologic changes. On the other hand, I don’t believe the researchers considered subjects at elevated altitude. Use of respirators at elevated altitude is a favorite research subject of mine.

An easier, more accurate way to administer respirator fit tests using sweet or bitter fit test methods.

QualFit™ software automates and records qualitative respirator fit testing using Saccharin and/or Bitrex aerosol solutions. The software prompts the operator to deliver the aerosol solution with the correct number of squeezes for each exercise, at the proper time, and in the proper order. This improves fit testing accuracy. The software displays the current exercise in progress, automates the timing sequence and calculates the number of squeezes to be administered, based on threshold screening results. Visual and audible prompts allow the operator to focus their attention on the respirator wearer. The entire procedure becomes less frustrating for the operator and subject being tested. The software tracks each step of the fit testing procedure required in mandatory Appendix A of the OSHA Respirator Standard. QualFit™ software improves the quality and efficiency of respirator fit testing. An OSHA compliant report can be printed or electronically saved. The employer benefits by knowing the test procedure was properly administered and provides written documentation for compliance with record keeping requirements specified in paragraph “m” of the OSHA standard. The employee benefits by knowing a standardized procedure was followed, rather than what often appears to be a random procedure.

For Information visit: www.QualFit.net
To place a secure online credit card order visit: https://qualfit-software.square.site/

Fit Testing Refresher & Advanced Topics
This 1-day course is specifically designed for the person who has been conducting fit testing, but needs a better understanding as to why poorly fitting respirators pass can pass a fit test and why good fitting respirators fail. This class provides an opportunity to discuss advanced topics not covered during a typical 2-day fit testing workshop due to time limitations. This course is also valuable for respirator program administrators who need a better understanding of fit testing procedures.

2023 Course date to be determined in Cincinnati

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Respirator Tidbits and Fun Facts
This section explores respirator related facts, points of interest, and tidbits.

As a reminder, under normal conditions, exhaled respiratory droplets smaller than 100 µm in diameter, would completely dry out before falling 2 meters to the ground. This fact, is important to the understanding of airborne transmission. To learn more about this, study the now famous Wells evaporation-falling curve of droplets. To understand the Wells theory on droplet nuclei, read his 1955 book: Wells WF. Airborne contagion and air hygiene. Cambridge, MA: Harvard University Press; 1955.

Respiratory Transmission:
According to a viewpoint expressed by Kevin Fennelly, the variability of transmission among respiratory pathogens appears to be less dependent on the physical particle size emitted by the diseased person, but more by biological factors such as the size of the emitted inoculum. The ability of the pathogen to survive dessication and other stresses of aerosolisation, airborne transport, and environmental factors such as air movement, temperature, humidity and host defenses, may be more important.

Respirator Program Administrator Training
Attend at least four days of respirator training from three different training categories and earn a certificate for Respirator Program Administrators. This program can be given onsite. For additional information, email us at info@DrMcKay.com

Respirator Selection & Development of Cartridge Change Out Schedules
2023 Dates to be Determined
Go to www.DrMcKay.com for details.

OSHA News

Respiratory Protection #2 in OSHA Violations
This isn’t good news, except for the fact it demonstrates increasing enforcement of the OSHA Respiratory Protection Standard (29 CFR 1920.134), but Respiratory Protection has moved up to the 2nd position for OSHA violations in 2021. Here’s a listing of the top 10.

1. Fall Protection (29 CFR 1926.501)
3. Ladders (29 CFR 1926.1053)
4. Scaffolding, General Requirements (29 CFR 1926.451)
7. Fall Protection-Training (29 CFR 1926.503)
8. Eye & Face Protection (29 CFR 1926.102)

New Jersey Agrees to Pay $273,064 Respirator Violation
In a June 2, 2022 OSHA News Release, the Center for Education, Medicine and Dentistry (CHEMED) in Lakewood, NJ agreed to pay OSHA $273,064 to resolve COVID-related respirator violations. The agreement was in response to 2020 & 2021 proposed penalties for requiring workers to use respirators without medical evaluation and without fit testing.

OSHA Regional Administrator Richard Mendelson said:
"Failing to evaluate employees’ ability to use respirators, and to test to ensure the respirators fit properly, exposes employees to potentially hazardous conditions. This settlement commits this employer to correcting those violations and enhancing its safeguards for employees,”

To read the OSHA News Release Click Here
Or, type the following URL:
https://www.dol.gov/newsroom/releases/osa20220602-0
Increasing Focused Inspections: Healthcare
On March 7, 2022, OSHA’s Office of Communications announced the release of a memorandum for a short-term increase in highly focused inspections directed at hospitals and skilled nursing care facilities that treat or handle COVID-19 patients. OSHA’s Assistant Secretary of Labor Doug Parker stated:

“We are using available tools while we finalize a healthcare standard,”

“We want to be ahead of any future events in healthcare.”

The agency will be initiating focused inspections to emphasize monitoring for current and future readiness to protect workers from COVID-19. Follow-up inspections will be conducted at sites that were previously issued citations, as well as where complaints were received but the agency did not conduct in-person inspections.

The memo reveals that “OSHA intends to expand its presence in targeted high-hazard healthcare facilities during a three-month period from March 9, 2022 to June 9, 2022.”

To read OSHA’s March 2022 Enhanced Enforcement memorandum in detail, [Click Here](#).

Proposed State Plan for Massachusetts
On June 29th, the U.S. Department of Labor's Occupational Safety and Health Administration published proposed rulemaking to approve a new occupational safety and health plan for Massachusetts state and local employers and their employees. Under the OSHA Act, state and local government employers are specifically excluded from federal coverage. However, the act provides for states to assume responsibility for occupational safety and health programs under the state's own plan, which must be approved by OSHA. Each state plan must include coverage of state and local employees. If approved, Massachusetts would be the newest OSHA-approved state plan for state and local government employees. The plan would cover approximately 6,500 public sector employers and nearly 434,000 public employees throughout the state. Private sector and federally employed workers in Massachusetts would remain under federal OSHA jurisdiction. This Notice of Proposed Rule Making (NPRM) will have a 30-day comment period. Comments and requests for a hearing must be submitted by Aug. 1, 2022. You can submit comments online at the federal eRulemaking portal using [https://www.regulations.gov/](https://www.regulations.gov/) or [Click Here](#). To review the Federal Register notice for submission [Click Here](#).

As a reminder, to be eligible for initial or developmental approval as a state and local government employee state plan, a state must be able to operate an occupational safety and health program that is, or will be, at least as effective as the federal program.

Spirometry Refresher:
September 20, 2022
Interpretation of Spirometry: Beyond the Numbers
September 21, 2022
Go to [www.DrMcKay.com](https://www.DrMcKay.com) for details.

Announcements from NIOSH
Healthcare Technology Targets for 2030
In a May 25, 2022 email, NIOSH released the following announcement regarding the role Personal Protective Technology (PPT) plays in protecting healthcare personnel. Reflecting on the nation's past decade of experiences with infectious diseases and non-infectious hazards, NIOSH recognizes the need to address existing gaps by leveraging NIOSH's unique capabilities related to PPT research, development, performance standards and test methods, and conformity assessment. In response to this growing need, NIOSH established DRAFT Healthcare PPT Targets for 2020 to 2030. To access these targets [Click Here](#).

Or, copy and paste this URL: [https://www.cdc.gov/niosh/npptl/hospresptoolkit/DraftHealthcarePPT.html](https://www.cdc.gov/niosh/npptl/hospresptoolkit/DraftHealthcarePPT.html)

In addition, NIOSH published a Federal Register Notice seeking public comments to assist with finalizing the DRAFT Healthcare PPT Targets for 2020 to 2030. To access the Federal Register Notice [Click Here](#). Or, copy and paste this URL: [https://www.federalregister.gov/documents/2022/05/16/2022-10413/draft-national-institute-for-occupational-safety-and-health-niosh-healthcare-personal-protective](https://www.federalregister.gov/documents/2022/05/16/2022-10413/draft-national-institute-for-occupational-safety-and-health-niosh-healthcare-personal-protective)
Interested persons or organizations are invited to submit applicable materials, including published and unpublished reports and research findings, that NIOSH may consider to:

1. Align its activities with other national efforts related to PPT;
2. Coordinate and prioritize NIOSH targets with complementary efforts by other entities;
3. Explore opportunities to collaborate with other entities;
4. Determine the level of effort needed to address specific targets;
5. Explore additional or alternative technical approaches; and
6. Explore additional knowledge gaps requiring support until 2030.

Comments must be received by July 15, 2022.

Public Health Emergency Respirators Now Obsolete

Between May and November 2020, NIOSH issued limited, temporary Public Health Emergency (PHE) approvals for N95 filtering facepiece respirators (FFRs) and powered air-purifying respirators (PAPRs) to address respirator supply shortages. On June 23rd (2022), NIOSH announced immediate action to obsolete (phase out) these PHE approvals. Obsoleted respirators are no longer permitted to be manufactured by the approval holder, but can continue to be sold, used, and recognized as NIOSH approved until the approval is revoked or rescinded.

Users in workplace settings that require the use of NIOSH-approved respirators may continue to use the obsoleted PHE-approved FFRs and PAPRs until the COVID-19 public health emergency ends. Once the public health emergency ends, the obsoleted approvals will be revoked by NIOSH, meaning they are no longer recognized as NIOSH-approved and cannot be used in workplace settings where the use of NIOSH-approved respirators is required.

PHE-approved respirators are easily recognized by the assigned approval number, which includes the designation "PH." PHE-approved FFRs are marked TC-84A-PHXX and PHE-approved PAPRs are marked TC-21C-PHXX, and both are easily identified on the NIOSH Certified Equipment List. As of June 23rd, 14 active FFR PHE and 5 active PAPR PHE approvals are obsolete.

For more information go to:

or, Click Here

Rescinded Respirators

NIOSH has honored a request by Pacific PPE Corporation to voluntarily rescind ALL NIOSH respirator approvals issued to Pacific PPE Corporation.

As of March 24, 2022, any respirator marked with a NIOSH approval label indicating any of the approval numbers below is no longer NIOSH-approved. The NIOSH Certified Equipment List will no longer include these approval numbers.

TC-84A-9278
TC-84A-9299
TC-84A-9313

Due to the voluntary rescission of these NIOSH approvals, respirators bearing any of the NIOSH approval numbers listed above may no longer be manufactured, assembled, sold, or distributed.

Visit the NIOSH NPPTL website to view the official notice of this voluntary rescission or Click Here.

On April 18, 2022, AOK Tooling issued a notice of stop sales, use, and return of Models 20190029-S and 20190029-M N95 filtering facepiece respirators under TC-84A-9286. These two models don’t meet the specifications of its certification. The following two issues were noted:

1) a change in design and placement of the abbreviated label without NIOSH approval prior to implementation.

2) additional designs/patterns to the outer layer graphics without NIOSH approval prior to implementation.
Respirator Manufacturer User Notices

AirBoss Defense Manufacturer User Notice
On June 20, 2022, AirBoss Defense Group (ADG) issued a user notice regarding FlexAir powered air-purifying respirators (PAPRs) produced during the U.S. public health emergency (PHE) and distributed in 2020. The notice identifies the serial numbers of PHE PAPRs and PAPRs that are not NIOSH approved. During conventional operations, regulatory agencies require the use of NIOSH-approved respiratory protective devices in occupational settings when deemed necessary.

From April to July 2020, ADG supplied FlexAir PAPRs to FEMA to facilitate pandemic response. To meet scale and pace of this requirement the contract did not require NIOSH certification. Some of these units were distributed by FEMA for immediate use to protect users during the COVID pandemic, as intended, while others may have been stored for future use.

Any individual or organization in possession of units marked with any of the listed serial numbers in the user notice, having questions can email AirBoss Defense at PHE@ADG.com or call 301-352-8800. More information can be found on the NIOSH Manufacturer Notice webpage: https://www.cdc.gov/niosh/npptl/usernotices/noticesmanufact.html under AirBoss Defense, or Click Here

Mislabeled Multipurpose Cartridge
3M recently received a single report of mislabeled 7422-SD1 MultiPurpose/P100 cartridges. While both the outside box in which this product ships (i.e., the shipper box) and the product pouch correctly labeled the cartridges as 7422-SD1, the label applied directly to the cartridge itself incorrectly indicated it was 7422-MB1 (Mercury Vapor/Chlorine Gas/P100).

For additional information, including how to identify the specific product applicable to this manufacturer user notice, use the following URL: https://multimedia.3m.com/news/media/21978920/mislabeled-7422-std1-multiple-p100-cartridges-notice.pdf or Click Here

3M™ Scott™ Air-Pak™ X3, Air-Pak™ X3 Pro, and X3-21 Pro SCBA’s Immediate Action Required
User Safety Notice SN052022

3M Scott has become aware of a potential issue with the SCBA models Air Pak X3, X3 Pro, and X3-21 Pro pressure reducers manufactured between 11/01/2019 and 04/12/2022. 3M Scott has received a small number of reports referencing the primary and/or secondary reducing valves missing PN 10005250 high pressure air filters. If filters are missing from the reducer, the potential exists that under certain conditions the user could experience a leak at the reducer seat retainer. To date the reports referencing this leak condition have been discovered during the Regular Operational Inspection and not during use. The 3M notice details the actions that should be taken to ensure SCBA contain filters. Prior to completion of the actions called for in the Notice, you may continue to use your SCBA, because instances of leaks have occurred on start-up pressurization. 3M-Scott recommends SCBA be inspected at the start of each use period, after every cylinder changeout in accordance with the modified inspection procedures included in the user notice, in addition to the normal Operational Testing regularly perform, and any applicable customer specific SOP. These are derived from 3M Scott Operation and Maintenance Instructions PN 595373-01, pg. 12, General Testing, 1-7.

A leak resulting from the absence of filters would be noticeable and detected around the very bottom of the SCBA. If at any time during the Regular Operational Inspection the user detects a leak the SCBA should be tagged out of service and actions taken according to the requirements of the Notice. If the user detects a leak at the pressure reducer during use, the user should immediately exit the IDLH environment and the SCBA should be tagged out of service.

3M Scott point out that these SCBA’s remain safe to use once the instructions in manufacturer’s user notice are carried out.

For additional information, use the following UR: https://multimedia.3m.com/news/media/2198202O/use-safety-notice-sn052022.pdf or Click Here
Updated Respirator Standard Testing Procedures

NIOSH has updated the following Standard Testing Procedures (STP):

STP-0124 - Determination of Remaining Service-Life Indicator - Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing Apparatus Standard Testing Procedures (STP) has been updated to Revision 1.2, dated 19 May 2022.

This test establishes the procedures for ensuring that the level of protection provided by the remaining service-life indicator requirements on Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing Apparatus (SCBA) meet NIOSH approval requirements.

Reason for the revision was to reflect changes with current testing practices & regulatory requirements, with updates to equipment, testing procedure, and photos.

For details: Click Here
Or, copy and paste this URL: https://www.cdc.gov/niosh/npptl/stps/pdfs/RCT-ASR-0124-508.pdf

Wanted: Damaged Fit Test Adapters

Rather than throwing away damaged fit test adapters, consider donating them to our fit testing workshops. We strive to make our fit testing workshops as realistic as possible. Incorporating damaged along with good fit testing adapters can provide a valuable training experience. If you wish to send a damaged fit test adapter or a damaged facepiece with unusual or difficult to find leakage for our respirator inspection workshops, send us an email at info@DrMcKay.com and we’ll provide shipping information.

Undamaged fit test adapters are also needed. On average, we lose one (1) fit test adapter every workshop due to wear and tear, poor adapter design, and other causes.

Wanted: Photos & Videos of Improper Fit Testing

Far too often respirator fit testing is conducted incorrectly. If you have a good photo or video, send it to us at info@DrMcKay.com. I might incorporate it into a future fit testing workshop or newsletter.

Medical Complications from Respirator Use

OSHA requires respirator medical clearance for persons required to wear respiratory protection. Researchers at the University of Cincinnati are collecting information on persons who:
1) Developed a medical complication while wearing a respirator, and
2) Identify pre-existing medical conditions causally related to the complication that developed.

If you have information (published or un-published) that establishes a link between a specific medical condition and a complication that developed as a result from wearing a respirator or during fit testing, please share this information with us. We’re particularly interested in cases where a medical complication was induced by respirator use. Information such as the specific type of respirator worn, work environment, duration of use, level of physical exertion, underlying medical conditions that contributed to the complication, etc., is needed. You can send this information to:
info@DrMcKay.com

Share Your Respirator Experience

Here’s an opportunity to contribute your knowledge and experience to others. If you have an interesting respirator selection or other challenging respirator problem (and solution), please submit it to info@DrMcKay.com. I may use your real-life problem to help train students in our graduate and continuing education programs in respiratory protection. This transfer of information will benefit others, maybe even your children or grandchildren.
Respirator Training Courses:
Dr. McKay and the University of Cincinnati is pleased to announce the following programs on Respiratory Protection and Fit Testing to your staff. They are:

Overview of Respiratory Protection:
http://www.drmckay.com/rtc-overview.shtml
October 18, 2022

Fit Testing Workshop (2-day):
http://www.drmckay.com/rtc-workshop.shtml
October 19-20, 2022 (2 spots remaining)

Respirator Selection & Cartridge Change Out Schedule Workshop.
2023 Course Dates to be Determined

Fit Testing Refresher & Advanced Topics
http://www.drmckay.com/rtc-resp-refresher-advanced.shtml
2023 Course Dates to be Determined

All courses are held in Cincinnati, unless noted otherwise. On-site training is available.

Respirator Selection & Change Out Schedules
This workshop provides guidance on respirator selection and the development of OSHA compliant change out schedules for respirator cartridges. A combination of lecture with practice problem sessions is used. The course is designed to teach students how to select a respirator based on workplace conditions (exposure level, type of contaminant, length of time to be worn, etc.). The selection process goes beyond the typical recommendation to "use a NIOSH approved air purifying respirator". Students will learn how to select a specific respirator as well as a specific filter/cartridge (when appropriate). More than a dozen guidelines for development of an OSHA compliant cartridge change out policy will also be taught, including common computer models and how to use them.

Partial Listing of Topics
Respirator Selection
* Review of facepiece definitions and modes of operation.
* Practical and theoretical basis for respirator selection based upon:
  Assigned Protection Factors (APF)
  - MUC’s, HR’s, IDLH, etc.
  - OSHA guidelines for respirator selection.
  - IDLH and non-IDLH atmospheres.
  - Selection steps and information gathering procedures.
  - Minimum respiratory protection versus practical alternatives.
  - Filter selection issues
    - How to select an N, R, or P filter.
    - Why filter selection is influenced by exposures below the exposure limit.
    - How to choose a 95 versus 100 filter.
  - Practical methods for handling unknown concentrations without defaulting to an SCBA.
  - Calculating MUC’s for mixtures.
  - Saturated Vapor Concentrations (SVC’s) and selection concerns.
  - When a particulate filter may be needed for organic solvents.
  - Equilibrium Vapor Concentrations.
  - Selection Workshop
    - Practical problems and solutions.

Development of Cartridge Change Out Schedules
* OSHA recommendations for a change out policy.
* Factors that affect cartridge service life.
* Learn how to develop an OSHA compliant change out schedule.
* Understanding the breakthrough curve.
* Common methods used to define breakthrough.
* What level of breakthrough should be used?
* Work rate tables.
* Effect of high relative humidity.
* Methods for determining service life (use, limitations, and practice problems)
  - OSHA recommendations
  - Rules of thumb
  - Using laboratory data
  - Using math models
  - Using computer (software) models
  - Cartridge testing methods (3 methods)
    Combining methods
* Learn how to develop a change schedule when computer models are not available.
* Recommendations for mixtures:
  - OSHA compliance method
  - mole fraction method
  - multi vapor model
* How to confirm your change-out schedule.
* Storage and migration concerns.
* Immediate Breakthrough Upon Reuse (IBUR) concepts

Gain confidence your current procedures are correct! Former students have found this information to be extremely valuable.
Fit Testing Workshop:
This two (2) day workshop provides comprehensive lecture and "hands-on" training for students who need to learn how to conduct an OSHA accepted qualitative or quantitative respirator fit test. Students will have an opportunity to fit test a variety of different style facepieces, including filtering facepieces, half, & full. A combination of lecture and "hands-on" testing in the presence of a trained and experienced instructors will be used to help participants learn how to conduct respirator fit testing to satisfy regulatory requirements. Hands-on fit testing will include qualitative and quantitative methods. The following types of fit testing equipment will be available: Saccharin (sweetener) and Bitrex (bitter) qualitative fit test kits using squeeze-bulb nebulizers, including QualFit software©. Quantitative fit testing with the TSI PortaCount, AccuFIT 9000, and the OHD QuantiFit©. Class size will be limited to ensure a favorable faculty to student ratio. Students will learn how to set-up, operate, maintain, troubleshoot, analyze, and interpret fit test results. Where appropriate, students will learn how to calibrate testing equipment and record results. All course materials, supplies, equipment, and reference manuals will be provided.

Students will also disassemble, reassemble, and inspect respirators for common problems. The workbook alone is a valuable reference for solving fit testing problems in the future.

This course uses a combination of lecture and small practicum groups to ensure students have ample time to practice and learn fit testing techniques. The second day provides students sufficient time to concentrate on the particular methods of interest to them. The "Hands-On" approach is emphasized in this course. Students will have the opportunity to fit test several different make and model respirators. The fit testing workshop provides an opportunity to see and experience many different types of commonly used fit testing methods (qualitative and quantitative).

Individuals who plan to attend the fit testing workshop, but have little or no experience with respiratory protection should take our 1-day “Overview” class, routinely offered before the fit testing workshop. A substantial discount is given when both courses are taken.

Dr. McKay is the past chair of the ANSI Z88.10 Respirator Fit Testing sub-committee, a voting member of the full ANSI Z88 Respiratory Protection Committee, the AIHA Respiratory Protection Committee, and others.

Fit Testing Refresher & Advanced Topics:
This 1-day course is specifically designed for the person who has been conducting fit tests, but has not had formal training or needs a review. This course reviews OSHA fit testing requirements and helps the operator understand why poorly fitting respirators pass fit testing and why good fitting respirators fail. It also provides an opportunity to discuss advanced topics not covered during a typical 2-day fit testing workshop due to time limitations. This course is also valuable for respirator program administrators who need a better understanding of fit testing procedures and assurance that their fit testing program is being run properly. The emphasis of this course is on quantitative fit testing, although many of the concepts are applicable to all fit test methods.

Partial Listing of Topics
Review of fit test procedures
- Facial hair: issues & solutions
- Selection process
- Comfort assessment
- Interference with PPE
- Establishing pass/fail criteria
- Interpretation of fit test results
- Why user seal checks fail to detect leakage
- Why user seal checks create leaks not present
- Proper use of fit test adapters
- Selecting sample probe location
- Why leaking respirators pass fit testing
- Why good fitting respirators fail fit testing
- What does a high fit factor really mean?
- Wear time & non wear time issues
- Understanding fit factor vs protection
- When is quantitative fit testing required?
- Opportunity to get answers to your questions

This course can also be given on-site.

Overview of Respiratory Protection:
This one day course provides a practical overview of respirators, standards, guidelines, use, and limitations of commonly used air purifying respirators. This class also provides an excellent overview of the OSHA Respirator Standard. Little or no prior formal training is required. The morning session includes lectures on the types and use of respirators and basic respirator selection procedures using APFs and MUCs. The advantages and disadvantages of different respirator facepieces, filters (N, R, & P), cartridges, PAPR's, and the physiologic effects of wearing a respirator will also be discussed.

Respirator standards and program requirements will be reviewed to help the student comply with OSHA regulations. Discussion of qualitative and quantitative fit testing, user seal checks, worker training, and respirator medical clearance requirements will be provided. This course is
essential for those individuals who oversee respirator users in their work place or new to respiratory protection.

**Respirator Training at Your Location:**
A variety of respirator training programs are available on-site. Courses available include:
* Fit Testing Refresher & Advanced Topics
* How to Develop a Cartridge Change Out Schedule (1 day)
* Respirator Selection (1 to 1.5 days)
* Fit Testing for Health Care Professionals (1 day)
* Basics of a Respiratory Protection Program (2 days)
* Overview of Respiratory Protection (1 day)
* Respirator Fit Testing: Quantitative (1 or 2 days)
* Respirator Fit Testing: Qualitative (1 day)
* Fit Testing at your workplace. Not a course, but a hands-on program with your staff and equipment.

For information about QualFit® Software for qualitative respirator fit testing with sweet and/or bitter agents, go to [www.QualFit.net](http://www.QualFit.net)

What is QualFit® software?
12 minutes

Basic Operation of QualFit® Software:
18 minutes
[https://youtu.be/vfwfuVOkAKw](https://youtu.be/vfwfuVOkAKw)

Comprehensive Fit Test Training Video
54 minutes
[https://youtu.be/FxpVsm3OhLY](https://youtu.be/FxpVsm3OhLY)

Respirator Fit Testing Errors and Solutions - 21 minutes
[https://youtu.be/0RsQEsOcS7o](https://youtu.be/0RsQEsOcS7o)

QualFit® Full Screen Option - new video
(5 minutes)
[https://youtu.be/RJr-IIKTLas](https://youtu.be/RJr-IIKTLas)

The new full screen exercise option makes it easier for the test operator to visualize the exercise testing screens during the test procedure, even when standing 8 or more feet away. In addition, audio beeps and changes in font color help to ensure the aerosol is delivered at the proper time and sequence as required by OSHA, ANSI, ASTM, ISO and other organizations.

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To be added to our Newsletter, go to [www.DrMcKay.com](http://www.DrMcKay.com)

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Roy McKay, Ph.D.
University of Cincinnati
[www.DrMcKay.com](http://www.DrMcKay.com)

I hope you enjoy this newsletter. Dr. McKay volunteers his time to many standard setting organizations and governmental agencies. Dr. McKay does not receive public or private funding for these services. Therefore, donations are appreciated and help this practice to continue. The opinions in this newsletter are Dr. McKay’s and not the University of Cincinnati.

[Click Here to Donate](http://www.DrMcKay.com)

Dr. McKay has approximately 40 years of national and international experience in all areas of respiratory protection including research, teaching, clinical practice, peer reviewed publications, and consultation as a faculty member at the University of Cincinnati. Dr. McKay is past chair of ANSI/AIHA Z88.10 (now ASTM), the committee responsible for “Respirator Fit Test Methods” and a member of ANSI/ASSE Z88.2-2015, which published the “American National Standard - Practices for Respiratory Protection”. Respirator committee assignments also include the American Industrial Hygiene Association's Respiratory Protection committee. He has conducted respirator fit testing, training, and consultation services for governmental agencies, including OSHA, NIOSH, NPPTL, CDC, private industry, and respirator manufacturers. He's developed more than a dozen different continuing education courses on respiratory protection, which include fit testing, respirator selection, cartridge change out, program administration, filter penetration, protection factors, and other topics.