

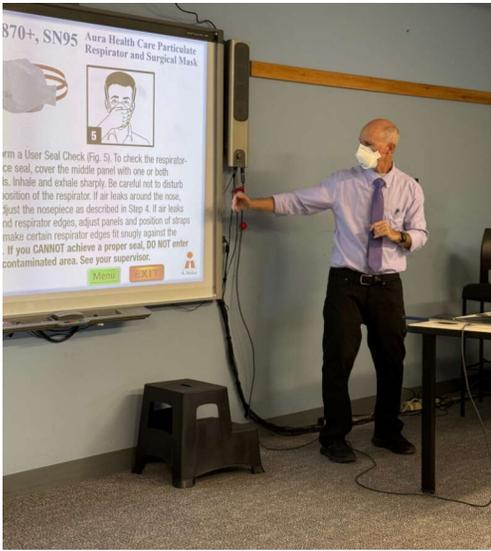
Respiratory Protection Newsletter - February 2026

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Featured Courses:

- Overview of Respiratory Protection** April 21, 2026
- 2-day Respirator Fit Testing Workshop** April 22-23, 2026

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Dr. McKay at Respirator Fit Testing Workshop. Bermuda, October 2025

Time to Retire the Rainbow Passage?
Rethinking the Talking Exercise for Respirator Fit Testing

Most respirator fit testing programs use the Rainbow Passage as the standard talking exercise. This is often because fit test operators believe OSHA requires it or because fit testing software includes it by default. In reality, there is no evidence that reading a prepared text is better at detecting leakage than simply speaking loudly. What truly stresses the face to facepiece seal is jaw movement, inspiratory flow, and the negative pressure generated during louder vocalization. Quiet reading does **not** reliably produce these conditions. For many real world respirator users, the Rainbow Passage unintentionally reduces vocal effort and may allow a poorly fitting respirator to pass a fit test.

This article explains why the Rainbow Passage is often inferior in practice, clarifies what OSHA actually requires, and provides practical alternatives that better simulate workplace conditions. It's the

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- Fit Testing Refresher & Advanced Topics**
 May 14, 2026

physical movement of speaking (nose-to-chin distance changes), inspiratory flows, and negative pressures generated that's important, **not** a specific passage that matters.

Does OSHA Require the Rainbow Passage?

No. When the talking exercise is required, the OSHA accepted mandatory fit testing protocols in 29 CFR 1910.134 Appendix A, Part 1 says:

“The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.”

OSHA doesn't claim the Rainbow Passage is uniquely “better” than other forms of talking. It's included only as an example of a standardized talking exercise having a duration of approximately 1-minute. OSHA explicitly says the test subject can count backward from 100 or recite a memorized poem or song. OSHA's rationale is that standardization and reproducibility of the talking exercise is important, **not** that the rainbow passage is superior to finding leakage. In fact, in most cases, it's less likely to find leakage. The respirator standard permits other options.

One exception to the requirement for reading is the OSHA 2019 Fast Fit protocol for filtering facepiece respirators (FFRs). This exercise protocol is only permitted when using ambient aerosol condensation nuclei counter (CNC) technology. This protocol is **not** permitted for any of the qualitative fit test methods or CNP. The OSHA fast-fit method for FFRs specifically says:

*“The test subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor for 30 seconds. He/she **will** either read from a prepared text such as the Rainbow Passage, count backward from 100, **or** recite a memorized poem or song.”*

OSHA's instructions for the Fast protocol are more specific and far more limiting. The wording above essentially says the subject **will read**. It also doesn't provide other options. You're limited to three (3). It's either the rainbow passage, count backwards, or recite a memorized poem or song. This is very **unfortunate**. In comparison, the standard exercise protocols say the subject “**can read**”, thus providing more options. I'm not sure the authors of the OSHA standard even recognize this difference. And, as mentioned above, there are no studies showing reading to be superior to speaking loudly. Furthermore, there is no data to suggest counting backwards is more effective than counting forward. This is another **unfortunate** requirement, because

counting backwards may be difficult for some subjects, causing them to hesitate and/or speak softly.

With exception to research studies where I may be “forced” to use the rainbow passage, I don't use it in my clinical practice. In my fit testing courses, I discuss the rainbow passage, but don't recommend it, because it's less likely to detect respirator leakage.



Here's why many subjects speak softly when asked to read a standardized text:

The Rainbow Passage Unintentionally Reduces Vocal Effort:

During fit testing, the goal of the talking exercise is to create realistic, seal-challenging conditions, namely, increased mouth/jaw motion and the higher inspiratory flow that accompanies louder speech. Asking subjects to read the Rainbow Passage often leads to soft speech, especially among real-world respirator users. Soft speech produces lower inspiratory flow and smaller nose-to-mouth distance changes. This is less challenging to the face-to-facepieces sealing surfaces and doesn't represent negative pressures seen during actual respirator use.

Reading Anxiety and Performance Pressure:

When subjects worry about mispronouncing words or reading aloud, vocal intensity drops. Pausing, hesitation, and reduced airflow follow.

Distorted vision:

There are several causes of distorted vision that potentially impairs reading during fit testing. They include:

Missing readers or corrective lenses:

In full-facepiece testing, workers often don't have readers or corrective lens inserts available during the fit test. This can lead to difficulty reading standardized text, resulting in squinting, excessive pausing of speech, and softer speech.

Fogging of Facepiece Lens:

During fit testing, fogging of the facepiece lens may occur. This is especially true when converting positive pressure facepieces to negative pressure for the purposes of

accomplishing a fit test. Programs that use surrogate facepieces may not have nose cups, causing additional fogging of the facepiece lens.

Distortion induced by fit testing equipment:

Qualitative respirator fit testing with sweet or bitter test agents uses an enclosure (i.e., hood) to maintain the challenge concentration during testing. The front of the enclosure incorporates a transparent viewing panel to allow observation of the subject throughout the test. However, this panel is not optically rated and introduces visual distortion for the subject reading the rainbow passage or other standard text. Vision is further impaired if the subject is wearing a full facepiece respirator that is prone to fogging.

Limited English proficiency:

Non-native speakers naturally reduce volume and discourages the subject from speaking loudly. In an effort to avoid mispronunciation, voice lowers, inspiratory flow patterns change, in-facepiece pressures are reduced, and pausing between words increases.

Illiteracy or low literacy:

Some users simply cannot read the passage; soft mumbling or silence follows, defeating the exercise's intent.

Unfamiliar vocabulary and density:

The Rainbow Passage is phonetically rich, but includes un-common words. Unfamiliarity encourages careful, quiet articulation rather than the projected voice we want.

Facepiece acoustics:

In workplaces, especially those with noisy environments, respirator wearers need to speak louder to overcome the reduction in voice transmission caused by the respirator. In these environments it's much more important to ensure the subject is speaking loudly during the fit test to simulate workplace conditions. Casual reading of the rainbow passage usually doesn't reach this level.

Why louder speech better stresses the seal

Loud speech increases nose-to-chin distances, volume of air inhaled, inspiratory flow, and greater in-facepiece negative pressures. These contribute to altered flow patterns and face-to-facepiece sealing surfaces. These changes are not replicated when a subject speaks softly.

Practical Recommendations for Better Fit Testing:

After decades of clinical practice, research, and

instruction, I recommend simple, reliable talking exercises that consistently promote louder, continuous speech, without relying on reading ability.

My suggested instructions:

Count from 1 to 20

Say the letter of the letters of the alphabet in any order. Repeat, if necessary.

You'll be surprised how many people hesitate, when they don't recall the proper order.

These exercises:

Require no reading

Reduce performance anxiety

Encourage natural speech patterns

Produce better jaw motion and airflow

If English is not the subject's primary language, encourage them to speak in any language they prefer. Accuracy of words doesn't matter, volume and continuity do.

In Conclusion:

OSHA specifies which exercises must be included during respirator fit testing, but the standard does not emphasize how they should be performed. This has led to widespread over reliance on the Rainbow Passage, even though it often suppresses vocal effort and reduces the likelihood of detecting leakage.

It's not what you say, it's how loudly you say it. Loud, continuous speech is far more effective at challenging the facepiece seal than quiet reading of a standardized text.

If you want to learn other ways to detect poorly fitting respirators, come to my 1-day **Fit Testing Refresher & Advanced Topics** course on **May 14, 2026** and learn from a master fit tester.

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 2-day fit testing workshop, where time is limited. 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. You'll also learn tricks fit test operators' use to pass poorly fitting respirators (both QLFT & QNFT).

May 14, 2026

PAPR Interference with PDSs

The Mine Safety & Health Administration (MSHA) permits miners to use Powered Air Purifying Respirators (PAPR). However, electromagnetic interference from the PAPR can cause **failure** of a Proximity Detection System (PDS), when worn too close to the battery or motor/blower of a PAPR. Keep in mind, these devices are also used in places, not just mines. For those not familiar with these devices, here's a brief description and how they're used:

A Proximity Detection System (PDS) is a device designed to protect workers from getting too close to dangerous equipment or hazardous areas. It works using sensors, such as radio signals, magnets, or cameras to track where people and machines are. If someone enters a potentially dangerous area, they can:

- Warn the worker,
- Alert an equipment operator, or
- Automatically slow or stop a machine.

These systems are widely used in mining and heavy industry to prevent collisions, reduce injuries, and keep workers aware of their surroundings. Some PAPRs have been found to interfere with PDS signals. This interference can reduce the system's ability to detect workers accurately, creating a potential safety risk.

The illustrations shown below was created by MSHA to show miners how they can position their PDS when using belt-worn and neck-supported PAPRs and maintain the recommended separation distance. Since the position of the PAPR is basically set in one position, in practice, this means the position of the PDS would need to be changed. To prevent electromagnetic interference with Proximity Detection Systems, at least 6-inches of separation between their PDS and the battery or motor/blower of their PAPR is needed. While the MSHA alert is specific to miners, the electromagnetic interference would apply to any user/worker wearing a PDS device.

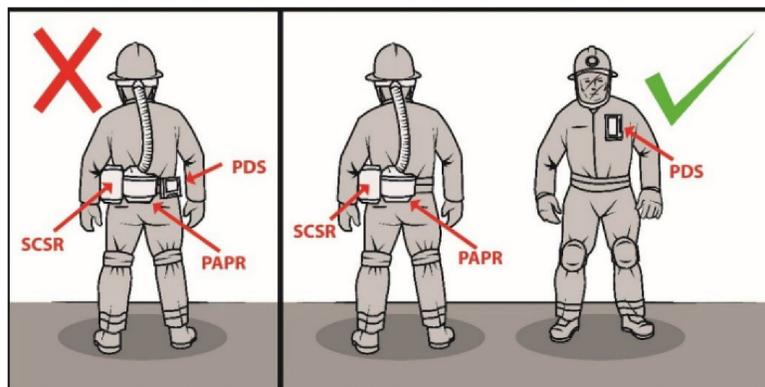


Illustration of positioning of the PDS's when using a belt-worn PAPR.

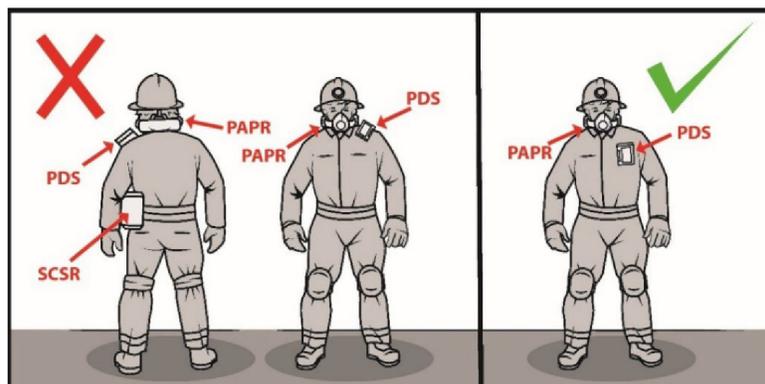


Illustration of positioning of the PDS's when using a neck-supported PAPR.

Source: MSHA Safety Retrieved online Dec 2, 2025 MSHA.gov

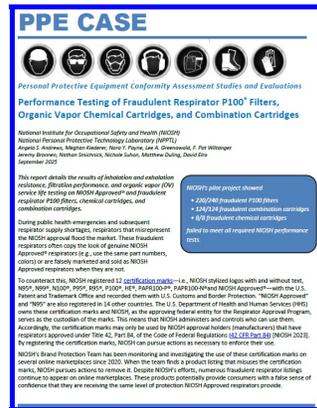
In summary, to prevent interference, miners must maintain at least six inches of separation between their PDS and the battery or motor/blower of their PAPR. If PAPRs are part of your safety program, make sure they don't compromise PDS performance.

Fraudulent Respirators Fail NIOSH testing

A 2025 NIOSH PPE CASE report, revealed that fraudulent respirator components such as P100 filters, organic vapor cartridges, and combination particulate/cartridges frequently failed performance testing.

Previous newsletters have identified and discussed the fact that online marketplaces are a common source for fraudulent respirators and respirator components. These respirators often look to be genuine NIOSH-approved respirators and/or components to the untrained eye. In many cases, they commonly have similar physical characteristics (same part number, color, etc.), but have not approved by NIOSH.

In the 2025 NIOSH report; 220 out of 240 fraudulent P100 filters, all 124 fraudulent combination cartridges, and all eight fraudulent chemical cartridges failed to meet required NIOSH performance tests.



Below are some of the results reported by NIOSH.

P100 Filter Testing:

220 out of 240 (92%) fraudulent P100 filters representing 11 out of 12 products had maximum penetration values above the NIOSH maximum limit.

Organic Vapor Cartridge Testing:

8 out of 8 (4 pairs) of fraudulent organic vapor chemical cartridges exhibited values below the NIOSH minimum service life requirement, resulting in failures. All fraudulent cartridges experienced chemical breakthroughs in less than five (5) minutes.

Combination Cartridges:

124 of 124 (100%) fraudulent combination cartridges failed to meet all NIOSH performance tests. For one product, all of the cartridges tested experienced breakthrough in **less than one minute!**

To read the entire NIOSH report, go to the following URL:

https://www.cdc.gov/niosh/media/pdfs/2025/01/npptl_casereport_p2022-0101.pdf

Or, [Click Here](#)

Another Asphyxiation Fatality:

A recent OSHA citation underscores the deadly risks of oxygen-deficient atmospheres in industrial settings. According to a December 2025 OSHA News Release and preliminary reports, a Georgia-based engineering and construction company faces \$20,522 in fines following a worker fatality at the Hanwa Q Cells solar plant in White, Georgia.

What Happened?

In May 2025, a contractor was found unresponsive on top of a storage tank (presumably Nitrogen) at the facility and was later pronounced dead. Local emergency responders measured the oxygen level at the top of the tank at approximately 15%, well below the OSHA minimum safe level of 19.5%. OSHA, ANSI, and ASTM all classify this as an IDLH (Immediately Dangerous to Life or Health) oxygen-deficient atmosphere. It's likely the oxygen concentration was even lower at the time of the incident.



OSHA Findings

The employer was cited for two serious violations:

1. Failure to protect employees from asphyxiation hazards related to nitrogen gas.
2. Failure to provide effective information and training on hazards associated with nitrogen gas and oxygen-deficient atmospheres.

Why Nitrogen Is a Silent Hazard

Nitrogen is not itself specifically toxic at these concentrations and duration of time, but it displaces oxygen, creating an invisible and odorless danger. It's the reduction in Oxygen that causes asphyxiation. Workers often underestimate this risk because there are no warning signs, until it's too late.

Lessons Learned

Always test oxygen levels before entering confined spaces or elevated work areas near tanks. Use continuous atmospheric monitoring where inert gases like nitrogen are present. Provide comprehensive training on oxygen deficiency hazards and emergency response. Review and update confined space entry procedures regularly.

If additional details become available, I'll provide an update on this unfortunate incident. In the meantime, take this as a reminder to audit your safety programs today. Oxygen deficiency kills silently and quickly.

Getting Rid of Suction Cups - Tubing Holders™ Now Available

If you're frustrated with suction cups that won't stick to the ideal sample location or fall off during fit testing, then Fit Test **Tubing Holders™** are the solution. Tubing holders replace suction cups and clips used with ambient aerosol quantitative respirator fit testing equipment, such as the TSI PortaCount®, AccuFIT 9000®, and AeroFit® systems. Tubing holders make fit testing **faster, easier, and more reliable**. More importantly, they reduce the occurrence of passing of poorly fitting respirators. They're also more hygienic and re-usable. In the long term, they're less expensive than replacing suction cups and clips.



When a suction cup dislodges during a fit test, testing must stop and the subject must remove (doff) the facepiece. The operator must then re-install the suction cup, repeat another donning with seal checks, re-start the fit test, and hope it doesn't happen again.

Tubing Holders™ are also easier to remove. No more struggles trying to pull the metal clip from the interior sample tubing. You'll also save the embarrassment of repeating fit tests when suction cups unknowingly dislodge. Rubber suction cups are not flavored and don't taste good. Consequently, there's no satisfaction when a suction cup dislodges and the subject sucks on it like a lollipop.

For additional information use this link:
<https://roy-mckay-phd.square.site/tubing-holders>
Or, [Click Here](#)

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
info@DrMcKay.com

Coal Workers' Pneumoconiosis Deaths

The December 18, 2025 edition of the CDC Morbidity and Mortality Weekly Report (MMWR) reported new findings for Coal Workers Pneumoconiosis deaths in the U.S.. Since this is of potential interest to readers of my respiratory protection and pulmonary function testing newsletters, I've included it in both. A copy of the abstract is provided below:



Coal workers' pneumoconiosis (CWP) is a preventable, progressive occupational lung disease caused by inhaling respirable coal mine dust, a complex mixture commonly containing coal, crystalline silica, and other silicate minerals. Early pneumoconiosis can be asymptomatic, but advanced disease often leads to disability and premature death. To describe CWP-associated mortality among U.S. residents aged ≥15 years by industry and occupation, CDC conducted an exploratory analysis of National Vital Statistics System multiple cause-of-death data for 2020–2023, the most recent years that include information on decedents' usual industry and occupation. During 2020–2023, CWP was listed on the death certificate of 1,754 decedents (age-adjusted CWP-associated death rate = 1.3 per 1 million). By industry group, the highest number of CWP-associated deaths occurred among workers in the mining industry (1,255). The highest proportionate mortality ratios (PMRs) were among persons employed in the mining industry (PMR = 50.0) and the construction and extraction occupations (6.2). Among workers employed in the mining industry, the highest PMR was among underground mining machine operators (164.6). The continuing occurrence of CWP-associated deaths underscores the potential value of a comprehensive prevention program (maintaining efforts to control occupational coal mine dust exposures, combined with early disease detection efforts and medical care) and supports potential benefits of ongoing surveillance.

Source: Mazurek JM, Dodd KE, Syamlal G, Blackley DJ, Weissman DN. Coal Workers' Pneumoconiosis–Associated Deaths — United States, 2020–2023. MMWR Morb Mortal Wkly Rep 2025;74:627–633. DOI:
<http://dx.doi.org/10.15585/mmwr.mm7441a1>
Or, [Click Here](#)

MSHA News

Lead Exposure to Miners - MSHA Alert

During September 2025, the Mine Safety and Health Administration (MSHA) posted a 1-page “**Health Alert**” warning miners they can be exposed to generate dangerous concentrations of lead. Common routes of exposure are inhalation and ingestion. Target organs include damage to the nervous system, kidneys, and reproductive system. It raises concerns about contaminated clothing, food, drink, and bringing lead contaminated clothing into your home. With respect to respiratory protection, recommendations include:



- Wear an air-purifying respirator with high-efficiency filters in all work areas that have exposure to lead dust or fumes.
- Be clean shaven and fit tested to ensure maximum respirator efficiency.

To get a copy of the 1-page Health Alert, [Click Here](#)

Wanted: 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 and undamaged fit testing adapters provides 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 use in our respirator fit testing workshops, send us an email at info@DrMcKay.com and we'll provide a shipping address.



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, improper removal and other causes. If you've switched to another fit testing method and no longer need the adapter, rather than putting unwanted adapters into a landfill or taking-up space in your cabinet, donate them to our workshop.

QualFit® Software®

An easier, more accurate, and defensible 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.

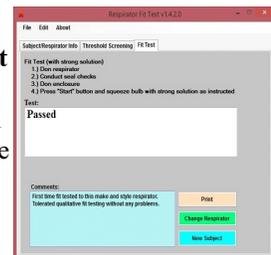


QualFit® - Making Respirator Fit Testing Simple

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

The name (mark) **QualFit®** is registered with the U.S. Patent & Trademark Office.
QualFit® Software® is registered with the U.S. Copyright Office June 13, 2021.

Final screen indicating test passed and operator comments. Includes option to print now or later, change to a different respirator, or select a new subject.



NIOSH News

101 Honeywell Respirator Approvals Rescinded

In a December 2025 announcement, NIOSH has honored a request by Honeywell International, Inc. to rescind 101 respirator approvals. As of December 8, 2025, any respirator marked with a NIOSH approval label and approval number listed in CA 2025-1102 is no longer NIOSH approved. Usually, I provide a list of affected approval numbers, but this is too many. The NIOSH Certified Equipment List no longer includes these approval numbers. Therefore a simple way to check if your product is affected by this or another rescission, go to the NIOSH Certified Equipment List. If the approval number is not listed, then your respirator is not NIOSH-approved. Use this link to visit the Certified Equipment List: <https://www.cdc.gov/niosh-cel/>

For additional information [Click Here](#)

Manufacturer Notices

3M Versaflo TR-800 PAPR

In an October 2025 announcement, 3M has identified that certain 3M™ Versaflo™ TR-800 Powered Air Purifying Respirator (PAPR) motors/blowers manufactured between September 2024 and April 2025 may contain a component that could cause them to **not** conform to their Intrinsic Safety (IS) rating. A list of affected serial numbers is provided in the link below.



Contact pins TR-800

The affected TR-801N PAPR motor/blower assemblies may include electrical battery contact pin assemblies that do not meet the intended classification requirements for intrinsic safety. For affected products, the assembly of the electrical battery contact pin(s) may not correspond with the design used during the intrinsic safety certification process. According to the 3M announcement, if the plunger/pin does not maintain contact with the pin housing when depressed and the unit is running, the current from the battery can cause the spring inside the pin assembly to heat up. If this occurs, the temperature of the dust protected pin assembly could potentially exceed the stated temperature rating. This increase in temperature could potentially reach the auto-ignition temperature of certain gases and vapors that may have diffused into the battery connector assembly and be present at a concentration within

their flammable or explosive limits.

For additional information and listing of potentially affected units [Click Here](#)

Interspiro SCBA Label Notice

In a December 2025 notice, Interspiro has issued a user notice impacting NIOSH Approval Number TC-13F-0962, relating to the identification (i.e., label) of 45-minute composite cylinders (part number 35689-01) used with Interspiro S9 and S9 Incurve SCBA units.

Affected cylinders are equipped with a QR code on the DOT label. By scanning this QR code, the cylinder's part number and the corresponding NIOSH approval information can be accessed.

Interspiro confirms there is no impact on user safety, and the cylinder as supplied continues to meet all applicable NIOSH safety and performance requirements. In the future, Interspiro will update future production so that the part number will be printed directly on the cylinder label together with the QR code.

To read the user notice [Click Here](#)



Interspiro S9

Honeywell now PIP

In a December 2025 letter Honeywell International Inc (HON) released a notice that it has transitioned to PIP Global Holdings Inc (PIP). As part of this transition, the NIOSH approval holder for the affected respirator approvals has been updated from HON to PIP. Therefore, whenever you check the NIOSH approval information of a NORTH by PIP Respirator in the NIOSH Certified Equipment List (CEL), instead of seeing HON, you will now see PIP listed as the approval holder.

For additional details [Click Here](#)

ISRP News

International Conference: Oct 20-22, 2026

ISRP International Conference will be held October 20 – 22, 2026 at the [Centre Mont-Royal](#) in Montreal, Canada. More details will be published in the coming months, including venue information, sponsorship opportunities, and a call for papers. <https://www.isrp.com/news/isrp-2026-centre-mont-royal>

Wanted: Photos & Videos of Improper Fit Testing

To my readers, please continue sending photos, videos and testimonials of improperly conducted fit testing. If you worked for an employer that conducted fit testing improperly, share your story. If your employer knowingly had the fit test operator administer the test incorrectly, share this too. I promise to keep your name and employer name confidential. Or, let me know if I can share it. If you have a good story, photo or video, send it to Roy@DrMcKay.com



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

Respirator Selection & Development of Cartridge Change Out Schedules

May 12-13, 2026

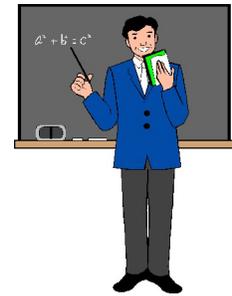
Submit a registration request early, otherwise the course may be cancelled if there's inadequate registration requests.

Go to www.DrMcKay.com for details.

Training Opportunities

Cincinnati Respirator Training Courses:

Dr. McKay and the University of Cincinnati are pleased to announce the following Respirator Training programs. They are:



Overview of Respiratory Protection:

<https://www.drmcKay.com/rtc-overview.shtml>

April 21, 2026

Oct 27, 2026

Fit Testing Workshop (2-day):

<https://www.drmcKay.com/rtc-workshop.shtml>

April 22-23, 2026

Oct 28-29, 2026

Respirator Selection & Cartridge Change Out Schedule Workshop.

https://www.drmcKay.com/rtc-resp_selection.shtml

May 12-13, 2026

Fit Testing Refresher & Advanced Topics

<https://www.drmcKay.com/rtc-resp-refresher-advanced.shtml>

May 14, 2026

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

Overview of Respiratory Protection:

This 1-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. This class will help the student understand the most significant physiologic effects of wearing a respirator and OSHA requirements for respirator medical clearance. An introduction to qualitative and quantitative fit testing and seal check procedures will be covered (unless all attendees are participating in the fit testing workshop, where these topics will be covered more comprehensively). This course is essential for those individuals who oversee respirator users in their work place or new to

respiratory protection.

For additional information and listing of course topics, request a brochure.

This course can be given at your location.

Fit Testing Workshop (2-days):

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 ASTM sub-committee on respirator fit test methods, the AIHA Respiratory Protection Committee, and others.

Respirator Selection & Development of Change Out Schedules

This 2-day workshop provides guidance on respirator selection and the development of an OSHA compliant change out schedule for cartridges and filters. A combination of lecture and practice problem sessions will be used. Instructional methods will include comprehensive lectures on each topic, practice problems, and an explanation of the solution by Roy McKay, Ph.D. This course is designed to teach the student how to select a respirator based on workplace conditions (exposure level, type of contaminant, etc.). However, there is more to respirator selection than comparing exposure levels to Assigned Protection Factors (APF's). Respirator selection is an information gathering process. This process, as well as its limitation and pitfalls will be shared with the student to help him/her select respiratory protection when the SDS simply says to "use a NIOSH approved respirator when exposure levels are exceeded". Students will also learn how to select a specific filter/cartridge (when appropriate). Guidelines for development of an OSHA compliant cartridge/filter change out policy will also be taught. Nearly ten 10 methods for developing a cartridge change out schedule (in addition to the usual guidelines of odor detection, ESLI, damage, etc.) will be provided. Perhaps the most useful and practical aspects of this class is learning how to merge various change-out methods to solve practical problems when computer software models don't work. Methods to confirm change out schedules will also be presented. Factors that affect re-use of cartridges due to desorption and migration will be presented to help understand if and when cartridges can be re-used. In-class practice problems help the student recognize if the training material is understood. This workshop is an excellent way to learn selection and change-out procedures from someone who routinely solves these and other respirator problems.

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.
- * 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!
 For additional information and listing of course topics, request a brochure.
 This course can be given at your location.

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
- Pass-fail criteria for annual (follow-up) fit testing
- Interpretation of fit test results
- Why high fit factors are not always good
- Why seal checks fail to detect leakage
- Why 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 OSHA doesn't say about fit test exercises
- What does a high fit factor really mean?
- When is quantitative fit testing required?
- Opportunity to get answers to your questions

This course is **not** a substitute for those who require an initial "hands-on" fit testing workshop. For initial training, students should take our 2-day fit testing workshop.

For additional information and listing of course topics, request a brochure.
 This course can be given at your location.

Onsite Fit Testing Workshop for N95 Filtering Facepiece Respirators

This comprehensive one-day workshop delivers expert-led instruction by Dr. McKay with "hands-on" experience to help you perform OSHA-accepted respirator fit testing -accurately and efficiently. Whether you're new to fit testing or need a refresher, you'll gain practical skills to improve testing outcomes and save time.

Participants choose the fit testing methods most relevant to their needs; quantitative and/or qualitative:

- Quantitative: TSI PortaCount, AccuFIT 9000, AeroFit, &/or QuantiFit
- Qualitative: Saccharin (sweet) &/or Bitrex (bitter); including **QualFit**[®] testing software, which makes qualitative fit testing easier and more reliable.

Regardless of the N95 fit test method or methods requested, you'll learn how to set up, operate, maintain, troubleshoot, and interpret results with confidence.

Class sizes are intentionally small to ensure personalized instruction and real-world practice. If respirator fit testing is part of your job, this course is essential. This training program will accelerate your learning experience and improve the quality of your fit testing program overnight. The included workbook will be your go-to resource long after training ends. OSHA/NIOSH/ANSI & ASTM tell you what to do, but not how or why. Learn from a master fit tester.

For additional information and listing of course topics, request a brochure.
This course can be given at your location.

Respirator Training at Your Location:

A variety of respirator training programs are available on-site. Courses available include:

- * Overview of Respiratory Protection (1-day)
- * Quantitative Respirator Fit Testing Workshop (1-day)
- * Quantitative Respirator Fit Testing Workshop for N95 Filtering Facepiece Respirators (1-day)
- * Qualitative Respirator Fit Testing Workshop for N95 Filtering Facepiece Respirators (1-day)
- * Fit Testing Refresher & Advanced Topics

- * How to Develop a Cartridge Change Out Schedule (1 day)
- * Respirator Selection (1 or 1.5 days)

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Roy McKay, Ph.D.
University of Cincinnati College of Medicine
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.

Disclaimer:

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