

Respiratory Protection Newsletter - November 2020

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Featured Course: **Respirator Overview & Fit Testing Workshop:**
April 20, and April 21-22, 2021

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How to Make Your Own Fit Test Solutions

During the coronavirus pandemic, sweetener (Saccharin) and bitter (Bitrex™) fit testing solutions may be unavailable due to high demand. When these situations, you can make your own solutions. Although OSHA provided a “formula” for preparing fit test solutions in the Respirator Standard (29 CFR 1910.134), it’s not a step-by-step procedure and instructions are not included. In response to fit test solution shortages, NIOSH and OSHA developed a recipe that would permit health care facilities and others to make their own solutions. The initial draft had significant limitations. However, I had the opportunity to review, comment, and revise three subsequent drafts. The final document for preparing qualitative respirator fit test solutions is now available on the NIOSH NPPTL website:

<https://www.cdc.gov/niosh/npptl/QualitativeFitTesting.html>,

These instructions are also available on the **QualFit** website in an easier, more readable format. Just select the “**Document and Resources**” tab at the top of the home page and scroll down. www.QualFit.net

As a reminder, when using sweet (Saccharin) or bitter (Bitrex™) fit testing solutions, you must follow the OSHA protocol found in mandatory Appendix A of the Respirator Standard. This protocol requires seven (7) fit testing exercises, each one minute in length. Total exercise duration for the fit test exercises alone is seven (7) minutes in length. This does **not** include the time necessary to select the most comfortable respirator, don the facepiece, conduct the required comfort assessment procedures, evaluate seal checks, or administer the threshold screening procedure. Failure to follow the protocol exactly as written, will permit poorly fitting respirators to pass the fit test (a far to frequent occurrence). **QualFit** software (www.QualFit.net) assists the operator with OSHA requirements as it guides the operator through each step of the fit testing process. When completed, it provides a printed report which complies with OSHA’s fit test recordkeeping requirements.

OSHA Response to Respirators and Particle Size
Questions regarding respirator filters and their ability to trap viral size particles is a frequent question asked during my respirator training courses. This question is easier to answer when the person asking the question is familiar with respirator filters. It's also helpful to have a variety of figures, graphs, and other illustrations available, since particle capture is affected by many factors. Recently OSHA posted an answer to this question on their website. Here's what OSHA posted:

Question:

Will an N95 respirator protect the wearer from the virus that causes COVID-19?

OSHA Answer:

Yes, an N95 respirator is effective in protecting workers from the virus that causes COVID-19. "N95" refers to a class of respirator filter that removes at least 95% of very small (0.3 micron) particles from the air. Some people have mistakenly claimed that since the virus that causes COVID-19 is approximately 0.1 microns in size, wearing an N95 respirator will not protect against such a small virus. That mistaken claim appears to result from a misunderstanding of how respirators work.

When an infected person expels the virus into the air by activities like talking, coughing, or sneezing, the airborne particles are composed of more than just the virus. The virus is part of larger particles that are made up of water and other materials such as mucus. These larger particles are easily trapped and filtered out by N95 respirators because they are too big to pass through the filter. This is called mechanical filtration. But mechanical filtration is just one of the ways that respirator filters keep particles from passing through the filter. An electrostatic charge also attracts particles to fibers in the filter, where the particles become stuck. In addition, the smallest particles constantly move around (called "Brownian motion"), and are very likely to hit a filter fiber and stick to it.

The National Institute for Occupational Safety and Health (NIOSH) tests respirators using particles that simulate a 0.3 micron diameter because this size particle is most likely to pass through the filter. If worn correctly, the N95 respirator will filter out at least 95% of particles this size. An N95 respirator is more effective at filtering particles that are smaller or larger than 0.3 microns in size.

The N95 respirator filter, as is true for other NIOSH-approved respirators, is very effective at protecting people from the virus causing COVID-19. However, it is important for employers

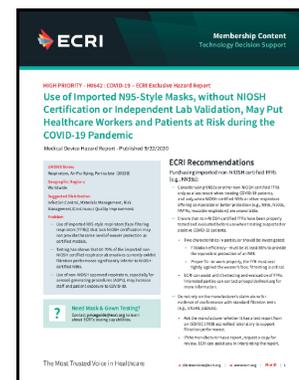
and workers to remember that the respirator only provides the expected protection when used correctly. Respirators, when required, must be used as part of a comprehensive, written respiratory protection program that meets the requirements of OSHA's Respiratory Protection standard. The program should include medical evaluations, training, and fit testing.

Dr. McKay's Comment:

Given the audience, the OSHA response is reasonably correct. The science of particle penetration and filtration efficiency is very complex. The last paragraph and specifically the last sentence, mentions the importance of a comprehensive, written respiratory protection program and fit testing. Not mentioned is the fact that facepiece fit, or lack of, is generally a far greater source of entry permitting viral size particles to be inhaled. This is particularly true for those wearing N95 filtering facepiece respirators (FFRs). Just look around, you'll frequently see these respirators worn incorrectly. In addition, qualitative fit testing for N95 FFRs is often administered incorrectly. When done incorrectly, a poorly fitting respirator can pass a fit test. While questions regarding filter penetration are common, few people question if the fit test was properly administered. In the case of NIOSH-approved N95 FFRs, we have a high degree of confidence that the filter is effective. I'd be far more concerned about the quality of the qualitative fit test. Want proof? Just watch how qualitative fit testing is administered. Count the number of exercises. Is it seven (7)? How many of these exercises are administered with a 1-minute duration? Is the challenge concentration maintained every 30 seconds? Are the proper number of squeezes used? I bet you'll reach the same conclusion as I have.

KN95 Respirator Issues Confirmed in ECRI Respirator Hazard Report

A September 22, 2020 Hazard Report by ECRI, an independent nonprofit organization dedicated to improving safety, quality, and cost-effectiveness in healthcare settings, confirmed many of the reliability concerns of filtering facepiece respirators (FFRs) imported from China. The ECRI study evaluated approximately 200 KN95 masks representing 15



different models. Of these, 60 to 70 percent of the masks did not meet the filter penetration standards established by NIOSH for N95 FFRs. These findings are similar to ongoing testing by NIOSH, which found more than half of the 358 KN95 models it tested do not meet filtration standards.

The ECRI Hazard Report advises those sourcing or using KN95 masks that are not NIOSH-approved to request and review test reports rather than relying on manufacturer claims. It also advised that those sourcing or using KN95s perform their own testing by an independent lab.

When respiratory protection is required, here are some of my comments, applicable to KN95 respirators:

You cannot judge the authenticity of a KN95 respirator by its appearance, labeling, or packaging. Do your homework to avoid buying a counterfeit respirator.

Use KN95s or other non-NIOSH-certified FFRs only as a last resort when treating COVID-19 patients, and only when NIOSH-certified N95s or other NIOSH approved respirators (P100 FFRs, elastomeric respirators, and/or PAPRs) are unavailable.

Remember, while filter efficiency is important, make sure you select respirators with good fitting characteristics. Face seal leakage is often far greater than filter penetration.

When buying KN95 respirators, ECRI provides the following guidance:

Determine whether other health care facilities have purchased from the manufacturer and what their experience was.

Contact the company if contact information is available.

Ask how long the firm has been making them.

Ask for names and contact information for U.S. purchasers of the FFR models under consideration.

Ask whether the manufacturer is a NIOSH-approval holder, and confirm by checking the NIOSH Certified Equipment List (CEL).

Ask for ISO/IEC 17025 accredited laboratory test reports demonstrating the filtration efficiency for the FFR.

Ask for current photos of the model of interest.

Request samples for evaluation.

If you're planning to purchase a large supply of respirators, consult with a respirator expert. The

money spent will be worth the cost. Most importantly, watch out for counterfeit products. To read the entire ECRI report, visit their website at www.ecri.org



CDC Releases Two Documents on Airborne Spread of SARS-CoV-2 Virus

On October 5, 2020 the CDC released two documents regarding spread of SARS-CoV-2 with respect to droplet and airborne exposure. They are:

- 1) **How COVID-19 Spreads:**
- 2) **Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission**



How COVID-19 Spreads

On October 5, 2020 CDC posted information on its website that acknowledges that SARS-CoV-2 can sometimes be spread by airborne transmission and not solely by droplets.

In this document, the CDC acknowledges that COVID-19 spreads very easily from person to person. How easily a virus spreads from person to person can vary. They also acknowledge the virus that causes COVID-19 appears to spread more efficiently than influenza but not as efficiently as measles, which is among the most contagious viruses known to affect people. They also say some infections can be spread by exposure to virus in small droplets and particles that can linger in the air for minutes to hours. These viruses may be able to infect people who are further than 6 feet away from the person who is infected or after that person has left the space. This kind of spread is referred to as airborne transmission and is an important way that infections like tuberculosis, measles, and chicken pox are spread.

There is evidence that under certain conditions, people with COVID-19 seem to have infected others who were more than 6 feet away. These transmissions occurred within enclosed spaces that had inadequate ventilation. Sometimes the infected person was

breathing heavily, for example while singing or exercising. Under these circumstances, CDC scientists believe that the amount of infectious smaller droplet and particles produced by the people with COVID-19 became concentrated enough to spread the virus to other people. Available data suggests it is much more common for the virus that causes COVID-19 to spread through close contact with a person who has COVID-19 than through airborne transmission.

CDC reports that touching surfaces is not likely to be a common mode for COVID-19 transmission.

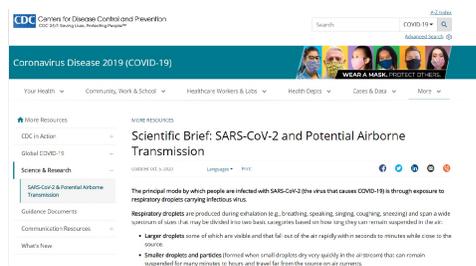
Topics included with this report are:

- COVID-19 spreads easily from person to person
- COVID-19 most commonly spreads during close contact
- COVID-19 can sometimes be spread by airborne transmission
- COVID-19 spreads less commonly through contact with contaminated surfaces
- COVID-19 rarely spreads between people and animals
- Protect yourself and others

To obtain a copy of this report, copy and paste the URL shown below
<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html>
or [Click here](#)

Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission

On this same day, CDC released another document called: ***Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission***, which provides additional information as to how SARS-CoV-2 spreads.



Topics included with this report are:

- Respiratory viruses are transmitted in multiple ways
- The term “aerosol” has been used in various ways to describe small particles that can move through the air
- The term “airborne transmission” has a specialized

- meaning in public health practice
- Airborne transmission is not equally efficient for all respiratory microbes
- The epidemiology of SARS-CoV-2 indicates that most infections are spread through close contact, not airborne transmission
- Airborne transmission can or SARS-CoV-2 can occur under special circumstances
- Prevention of COVID-19 by airborne transmission
- SARS-CoV-2 is a new virus, and we are still learning about how it behaves

To obtain a copy of this report, copy and paste the URL shown below
<https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-brief-sars-cov-2.html>
or [Click here](#)

N95 FFR Decontamination Concerns

An October 7, 2020 article by Max Filby of *The Columbus Dispatch* points out that the FDA has sharply criticized a Columbus Ohio facility known to use vaporous hydrogen peroxide to disinfect N95 filtering facepiece respirators (FFRs). As a result of N95 FFR shortages during the current COVID-19 pandemic, hospitals were searching for a ways to re-use N95 FFRs, which are designed as “disposable” facepieces. Vaporous hydrogen peroxide was found to be one of the most promising approaches because it not only killed the SARS-CoV-2 virus very effectively, but was also fairly successful in maintaining respirator structural integrity and filtration performance. This technology is used by several Columbus based hospitals, in part because it can handle a large number of respirators. Each decontamination unit can sanitize 80,000 N95 FFRs per day. FDA’s concern has nothing to do with the ability to disinfect respirators. Rather, their concern is in regards to issues related to proper tracking and reporting problems with the respirators after decontamination. According to the report, the N95 FFRs showed signs that the facepieces would degrade after just 2 or 3 disinfection cycles. FDA’s concern include, but are not limited to allergic reactions, shrunken or misshapen respirators, poor fit or seal, shredding, peeling, discoloration, straps breaking prematurely, odor issues, and skin irritation.

There is an important lesson to be learned. N95 FFRs are not generally not designed to be disinfected and repeatedly re-used. They have a limited lifetime. If you decide to disinfect and re-use N95 FFRs, be sure the respirators are carefully inspected for damage before use in areas that require respiratory protection. This is true regardless of the method of disinfection your program uses.

EPA approves first surface disinfectant products tested on the SARS-CoV-2 virus

With respect to COVID-19, anything older than a couple of months, seems to be old news. This makes it difficult to share relevant information. Regardless, a July 6, 2020 EPA press release announced the first two disinfectant products that were tested to safely and effectively kill the novel coronavirus (SARS-CoV-2) on surfaces. The two EPA approved products are: Lysol Disinfectant Spray (EPA Reg No. 777-99) and Lysol Disinfectant Max Cover Mist (EPA Reg No. 777-127). The press release clarifies that before pesticide products can legally make claims that they can kill a “particular” pathogen such as SARS-CoV-2, the claim must be authorized by EPA based on a review of data. Keep in mind, new (i.e., novel) viruses are typically not immediately available for laboratory testing.

EPA’s list of products that meet the agency’s criteria for use against SARS-CoV-2 (known as List N) includes more than 420 products. In July EPA updated the entries for two products on List N to show they have now been tested **directly** against SARS-CoV-2. These are the first List N products for which the agency has reviewed laboratory testing data and approved label claims against SARS-CoV-2. EPA expects to approve such claims for additional List N products in the weeks after the press release and certainly more have been added. However, it’s good to point out that none of the List N products were specifically tested against SARS-CoV-2, prior to July 6th.

All products on EPA’s List N meet the agency’s criteria for effectiveness against SARS-CoV-2. When using an EPA-registered disinfectant, follow the label directions for safe, effective use. Make sure to follow the contact time, which is the amount of time the surface should be visibly wet. Contact time is important and varies with different products. Remember this cleaning respiratory protective devices, fit test equipment, hoods for qualitative fit testing, etc. Additional information on EPA’s coronavirus efforts are found at: <https://www.epa.gov/coronavirus>

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. For additional information, email us at info@DrMcKay.com

What is **QualFit** software? Check out this 12 minute video:



<https://youtu.be/RwdMfrQXdTY>

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. 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 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 and assurance that their fit testing program is being run properly. **This program identifies tricks and omissions some fit test operators use to allow poorly fitting respirators to pass fit testing (QLFT & QNFT).**

Next course date is April 29, 2021

Questions from the Health Care Community about Respirator Fit Testing

Below is a sampling of respirator fit testing questions and comments received during the COVID-19 pandemic. The reason for posting these questions here is to provide readers with some insight regarding the level of confusion the healthcare community has towards respirator fit testing.

We're using irritant smoke for fit testing masks. Since everyone passes, is necessary to continue?

I can only test using the irritant smoke method. What is your opinion for using this test for the N95 1860 mask by 3M?

Because we can't get Saccharin and Bitrex solutions, we've ordered Banana oil. Does the fit test procedure differ using the oil?

My hospital is considering the following option to replace PAPR filters. The plan is to remove the PAPR filter from it's holder and replace it with filters from air conditioning units. How many layers would be acceptable?

We are looking at the possibility of using essential oils to replace sweet and bitter fit test agents. What are your thoughts on this?

Is there another way to do qualitative fit testing without the hood? We don't have any hoods to test the N95s.

Just letting you know, we stopped using hoods for fit testing. We discovered the hood caused respirators to fail the fit test. We get more respirators to pass when the hood isn't used.

Respirator Selection & Development of Cartridge Change Out Schedules

April 27-28, 2021 in Cincinnati

Go to www.DrMcKay.com for details.



OSHA Information

Respiratory Protection Guidance for the Employers of Those Working in Nursing Homes, Assisted Living, and Other Long-Term Care Facilities During the COVID-19 Pandemic.

On October 30, 2020 OSHA released the above-titled document.

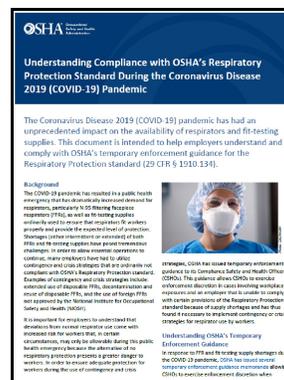
Yes, it's a long title, but a valuable document for an important segment of our society that has been greatly affected by the current pandemic.

I had the privilege of working on the development team responsible for developing this 7 page guidance document. To get your copy, [Click here](https://www.osha.gov/sites/default/files/respiratory-protection-covid19-long-term-care.pdf) or copy and paste the following URL:

<https://www.osha.gov/sites/default/files/respiratory-protection-covid19-long-term-care.pdf>



Understanding Temporary Enforcement Guidance with the Respiratory Protection Standard during COVID-19



On September 1, 2020, OSHA released a two page document to help employers understand and comply with OSHA's temporary enforcement guidance for the Respiratory Protection standard (29 CFR 1910.134). In response to respirator supply shortages during the

COVID-19 pandemic, OSHA has issued several temporary enforcement guidance memoranda allowing its Compliance Safety and Health Officers (CSHOs) to exercise enforcement discretion when considering issuing citations under the Respiratory Protection Standard and/or the equivalent respiratory protection provisions of other health standards. This

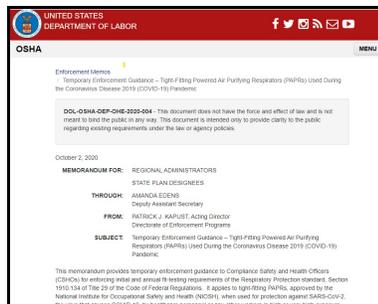
guidance allows CSHOs to exercise enforcement discretion in cases involving workplace exposures and when an employer is unable to comply with certain provisions of the Respiratory Protection Standard. Employers are expected to come into full compliance with the Respiratory Protection standard once supply chain issues are resolved (e.g., conduct fit-testing once fit-testing supplies become available). OSHA will revoke all of the temporary enforcement discretions and revert to the normal enforcement of the Respiratory Protection standard once the Agency determines that the additional enforcement discretion is no longer necessary.

For specific details [Click here](#):

Temporary Enforcement Guidance – Tight-Fitting Powered Air Purifying Respirators (PAPRs) Used During the COVID-19 Pandemic

Another temporary enforcement guidance document was released by OSHA on October 2, 2020. This one provides temporary enforcement guidance to Compliance Safety and Health Officers (CSHOs) for enforcing initial and annual fit-testing requirements.

This particular guidance applies to tight-fitting PAPRs, when used for protection against SARS-CoV-2.



This guidance applies only to fit-testing of NIOSH-approved **tight-fitting PAPRs** used as a contingency capacity strategy when performing job tasks with high or very high occupational exposure risk to SARS-CoV-2.

Employers have argued that they have been unable to obtain equipment required to perform the fit testing. In its new guidance, OSHA will use discretion before citing employers that use NIOSH-approved tight-fitting, powered air-purifying respirators when initial or annual fit testing is unavailable due to equipment shortages.

This guidance does **not** apply to:

- PAPRs that have not been approved by NIOSH;
- PAPRs used by any workers with low or medium exposure risk to SARS-CoV-2;

- PAPRs used by any workers for protection against airborne hazards other than SARS-CoV-2 (e.g., chemical hazards); and
- Loose-fitting hooded PAPRs that do not require fit-testing.

In circumstances where it is not possible to conduct fit-testing as required (e.g., due to supply shortages of fit-testing kits or solutions), OSHA field offices will exercise enforcement discretion concerning the initial and/or annual fit-testing requirements for properly sized NIOSH-approved tight-fitting PAPRs used by certain personnel for protection against SARS-CoV-2, as long as the employer has complied with all other applicable requirements of the Respiratory Protection standard.

OSHA Announces \$2,025,431 in Coronavirus Violations

In an October 2, 2020 News Release, OSHA announced it has cited 37 establishments for violations, resulting in proposed penalties totaling \$484,069 since the start of the coronavirus pandemic. On November 2, this figure **increased to \$2,025,431** with 144 establishments cited.

The statistics do not include citations issued by state OSHA agencies. Virtually all of the citations were issued to health care employers and assisted living facilities and represent only those investigations closed since the beginning of the pandemic. These numbers are likely to significantly increase as subsequent investigations conclude. The majority of these violations were respirator related. Here's a list where OSHA citing employers for violations, including failures to:

- Implement a written respiratory protection program;
- Provide a medical evaluation, respirator fit test, training on the proper use of a respirator, and personal protective equipment;
- Report an injury, illness or fatality;
- Record an injury or illness on OSHA recordkeeping forms; and
- Comply with General Duty Clause of the OSHA Act of 1970

To view the current list of establishments cited, initial penalty, etc., [Click here](#) or copy and paste the following URL:

<https://www.osha.gov/news/newsreleases/national/10302020>

Here's a Sample of NON-Healthcare OSHA Respirator Violations

September 11, 2020

U.S. Department of Labor Cites JBS Foods Inc. for Failing To Protect Employees from Exposure to the Coronavirus.

GREELEY, CO – The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has cited JBS Foods Inc. in Greeley, Colorado, for failing to protect employees from exposure to the coronavirus. OSHA proposed \$15,615 in penalties.

Based on a coronavirus-related inspection, OSHA cited the company – which operates as Swift Beef Company – for a violation of the general duty clause for failing to provide a workplace free from recognized hazards that can cause death or serious harm. The penalty assessed for the general duty clause violation is the maximum allowed by law. The company also failed to provide an authorized employee representative with injury and illness logs in a timely manner following OSHA's May 2020 inspection.

"Employers need to take appropriate actions to protect their workers from the coronavirus," said OSHA Denver Area Director Amanda Kupper. "OSHA has meat packing industry guidance and other resources to assist in worker protection."

OSHA guidance details proactive measures employers can take to protect workers from the coronavirus, such as social distancing measures and the use of physical barriers, face shields and face coverings when employees are unable to physically distance at least 6 feet from each other. Employers are also required to maintain injury and illness logs.

September 10, 2020

U.S. Department of Labor Cites Smithfield Packaged Meats Corp for Failing to Protect Employees from Coronavirus

SIOUX FALLS, SD – The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has cited Smithfield Packaged Meats Corp. in Sioux Falls, South Dakota, for failing to protect employees from exposure to the coronavirus. OSHA proposed a penalty of \$13,494, the maximum allowed by law.

Based on a coronavirus-related inspection, OSHA cited the company for one violation of the general

duty clause for failing to provide a workplace free from recognized hazards that can cause death or serious harm. At least 1,294 Smithfield workers contracted coronavirus, and four employees died from the virus in the spring of 2020.

"Employers must quickly implement appropriate measures to protect their workers' safety and health," said OSHA Sioux Falls Area Director Sheila Stanley. "Employers must meet their obligations and take the necessary actions to prevent the spread of coronavirus at their worksite."

OSHA guidance details proactive measures employers can take to protect workers from the coronavirus, such as social distancing measures and the use of physical barriers, face shields and face coverings when employees are unable to physically distance at least 6 feet from each other. OSHA guidance also advises that employers should provide safety and health information through training, visual aids, and other means to communicate important safety warnings in a language their workers understand.

Employees Asphyxiated While In Confined Space

OSHA cited a Texas industrial cleaning company with one willful and two repeat violations for confined space hazards. Included was failure to conduct appropriate tests to ensure atmospheric conditions were safe for entry. The violations were issued after two employees were fatally overcome by fumes while cleaning a tank trailer. "This tragedy could have been prevented if the employer had complied with the law and tested and monitored the oxygen level within the tank before permitting workers to enter," said OSHA Houston South Area Director Mark Briggs. Source: *EHS Daily Advisor* Oct 5, 2020

Penalty: \$497,920 fine



What is **QualFit** software?

Check out this 12 minute video:

<https://youtu.be/RwdMfrQXdTY>



Announcements from NIOSH

Assessment of Non-NIOSH approved International Respirators

August 2020 NIOSH reported results from a phase one study on the filtration performance results of Food and Drug Administration (FDA) Emergency Use Authorization (EUA) respirators that are not NIOSH-approved, but temporarily authorized for occupational use in the United States.

As of May 6, 2020, NIOSH completed 105 assessments of non-NIOSH approved international respiratory protective devices. There were 87 distinct manufacturers and 102 distinct models. Of these assessments, approximately 91% (95 of 105) of the respiratory devices used an ear loop design. For each of the 105 requests, NIOSH evaluated the filtration efficiency for each of the individual units and recorded the maximum and the minimum filtration efficiency observed and then determined whether:

- 1) all units within the assessment tested above 95% efficiency;
- 2) all units tested within the assessment tested below 95% efficiency; or
- 3) if there were a mixture of units—some testing above 95% and some below 95%.

Results:

In 35 of the assessments (33%), all individual units tested above 95% particulate filtration efficiency.

In 42 of the assessments (40%), all individual units tested below 95%.

In the remaining 28 assessments (27%), there was a mix of units that tested above and below 95%

The results of these assessments also found considerable range in filtration efficiency for most of the models assessed.

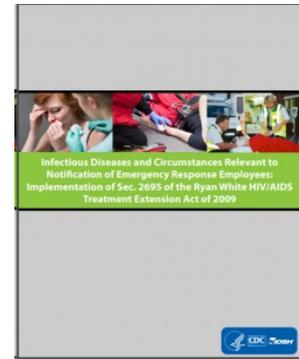
In summary, NIOSH evaluations show that many non-NIOSH-approved international respiratory protective devices have inconsistent filtration performance and most assessments resulted in filtration efficiencies less than 95%.

For details go to the source:

[Assessment of Non-NIOSH approved International Respirators](#)

Definition of Emergency Response Employee

In July of this year, NIOSH has updated the List of Potentially Life-Threatening Infectious Diseases to which Emergency Response Employees May be Exposed to include the addition of COVID-19, the disease caused by the virus SARS-CoV-2, and the definition of “emergency response employee (ERE).” The updated document defines EREs as firefighters, law enforcement officers, paramedics, emergency medical technicians, funeral service practitioners, and other individuals who respond to emergencies in affected areas while on the job. The new definition appears in the updated document "Infectious Diseases and Circumstances Relevant to Notification of Emergency Response Employees,"



To get your own copy, go to:

<https://www.cdc.gov/niosh/docs/2020-119/default.html>



Updated Respirator Standard Testing Procedures

During the month of May 2020, NIOSH updated two Standard Testing Procedures (STP) for SCBA's. Changes to both documents include updates to sections 3, 4, 5, & 6 with changes related to equipment, removal of outdated pictures, calibration requirements, the test procedure and updating the NIOSH logo. Here's the details and a link to the revised testing procedures:

STP-0122—*Determination of Exhalation Breathing Resistance—Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing Apparatus Standard Testing Procedure (STP)*—has been updated to Revision 1.2, dated 12 May 2020. <https://www.cdc.gov/niosh/nppt/stps/pdfs/RCT-ASR-0122-508.pdf>

STP-0123—*Determination of Gas Flow Measurements—Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing*

Apparatus Standard Testing Procedure (STP)—has been updated to Revision 1.2, dated 13 May 2020. <https://www.cdc.gov/niosh/nppt/stps/pdfs/RCT-ASR-0123-508.pdf>

STP-0064-Determination of Facepiece Carbon-Dioxide and Oxygen Concentration Levels of Tight Fitting, Powered Air-Purifying Respirators, With the Blower Unit Off or Non-Powered Respirators Standard Testing Procedure (STP)-has been updated to Revision 1.2, dated 24 July 2020. <https://www.cdc.gov/niosh/nppt/stps/pdfs/RCT-APR-0064-508.pdf>

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, please share this information with us. We are 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

2020 McKay Publication

Respirator Use at High Altitudes. Does an SCBA Respirator Protect Wearers from Oxygen Deficient Atmospheres Due to Increasing Altitude? *The Synergist*. Pages 26-29, January 2020.

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.



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>

April 20, 2021
October 19, 2021

Fit Testing Workshop (2-day):

<http://www.drmckay.com/rtc-workshop.shtml>

April 21-22, 2021
October 20-21, 2021

Respirator Selection & Cartridge Change Out Schedule Workshop.

http://www.drmckay.com/rtc-resp_selection.shtml

April 27-28, 2021

Fit Testing Refresher & Advanced Topics

<http://www.drmckay.com/rtc-resp-refresher-advanced.shtml>

April 29, 2021

Fit Testing Workshop Quantitative (1-day):

<http://www.drmckay.com/rtc-workshop1day.shtml>

Onsite only

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. 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 (1day)
- * Fit Testing at your workplace. Not a course, but a hands-on program with your staff and equipment.

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Roy McKay, Ph.D.
University of Cincinnati
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 the past chair of ANSI/AIHA Z88.10, 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 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.

Dr. McKay does not receive any public or private funding for this educational service. The opinions in this newsletter are those of Dr. McKay and not the University of Cincinnati.

For information about **QualFit** Software for qualitative respirator fit testing with sweet and/or bitter agents, go to www.QualFit.net



What is **QualFit** software?

Check out this 12 minute video:

<https://youtu.be/RwdMfrQXdTY>



Basic Operation of **QualFit** Software:

<https://youtu.be/vfwfuVOKAKw>



Comprehensive Fit Test Training Video

54 minutes

<https://youtu.be/ExpVsm3OhLY>

For information about **QualFit** Software for qualitative respirator fit testing with sweet and/or bitter agents, go to www.QualFit.net