

QuantiFit2[®]

OWNER'S MANUAL



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QuantiFit2 & OHD Logic Software

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Welcome

The QuantiFit2 can be used with or without OHD Logic software. When testing without a computer, all reports and test data may be retrieved from the instrument. Or, at a later time, data can be imported into Logic software (when Logic and the QuantiFit2 have been set up for merging or synchronizing data). The instrument is not compatible with FitTrack Gold, which comes with the original Quantifit. However, the data from FitTrack Gold can be imported into OHD Logic software.

This instrument portion of the manual will contain instructions for using the instrument without the software.

CAUTION: If you plan to synchronize or merge data to a computer database, it is imperative that you first set up Logic software and transfer the test subjects and other information into the QuantiFit2. [Please see the software section](#) ³⁶ of this manual for assistance and instruction.



Safety & Environmental

The instrument and related documentation must be reviewed for familiarization with safety markings and instructions before operating the instrument.

Environmental Conditions - The QuantiFit2 is for use at an altitude up to 2,000m (6,500 ft.) with a temperature range of 5 to 40 degrees C, maximum relative humidity of 80% non-condensing and pollution degree 2.

Any use of the QuantiFit2 that is not outlined in this manual may invalidate the protection of the instrument.

The QuantiFit2 comes with an external power supply that must be used for powering the instrument when not using the optional battery pack. If the power supply becomes faulty or damaged, it must be replaced. A power supply with the ratings listed in the [Specifications Appendix](#) ⁶⁶ must be used (100-240VAC, 50/60 Hz, 1A Max).

Under abnormal conditions, such as static discharge, it may be necessary to cycle power to achieve proper operation.

Caution - The CAUTION symbol denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the instrument or data. Do not proceed beyond a CAUTION symbol until the indicated conditions are fully understood and met.



Cross Contamination

OHD takes the safety and health of our customers very seriously. With this in mind, we believe it is important to address concerns about possible cross contamination during fit testing. The risk of cross contamination resulting from the use of a QuantiFit2 is very minimal. Fit Testing itself **does not** increase or decrease a person's risk of exposure to any virus or illness. The real threat is coming into close contact with an infected person no matter the location or activity.

The QuantiFit2 does not trap air in its system either before, during or after a fit test. The QuantiFit2 does not push air into the mask. The QuantiFit2 pulls air away from the test subjects mask and vents it out of the system. This means that the chances of contaminated air being in the system are, at worst, no more likely than contaminated air being in the surrounding environment. If an infected person were to be fit tested, there is no more risk of contaminated air being trapped and subsequently released on a succeeding fit test than there is just by walking into the fit test area.


The QuantiFit2 and accessories are subject to surface contamination like any item in the test area. Before and after fit test steps, when the test subject is wearing a respirator, his or her inhalation is coming through inlets in the OHD adapter kit and the vast majority of exhalation should travel through the exhalation valve and out of the respirator. There are many potential mask and adapter configurations. The chance could exist in a configuration that exhaled breath

could make contact with internal areas of an adapter kit. If it is suspected this has happened, disinfection would be appropriate.

For protection against the transference of surface contamination, all possibly contaminated surfaces the operator or subjects may contact need to be disinfected. This includes the QuantiFit2 and accessories. The adapter kits may be cleaned either by immersion, spray or wipe from an EPA approved disinfectant as these have been shown to efficiently inactivate over 99% of microorganisms (to include COVID-19) within a minute. The adapter should be dry before use in a fit test. The QuantiFit2 tubing should be carefully wiped down with an EPA approved disinfectant.

If there is a threat of contamination, the fit test operator should take precaution when carrying out fit testing according to the guidance provided by the CDC.

If masks are shared for fit testing, the fit test operator should follow *OSHA 1910.134 Appendix B-2 Respirator Cleaning Procedures* or the manufacturer's guidelines for the disinfection of the respirator to avoid any cross contamination.

See [26 Appendix D: CNP Diagram](#)  for an air-flow diagram with Controlled Negative Pressure and the QuantiFit2 system.

The QuantiFit2 measures face-to-facepiece fit and integrity of a respirator. With a perfect respirator and fit, all inhaled air is forced through the filter system, thereby providing maximum respiratory protection for the individual. If there is leakage at the face seal or through imperfections in the respirator, unfiltered air bypasses the filter system and enters the respirator, thus reducing respirator's ability to protect from contaminants. The QuantiFit2 directly measures air leakage in cubic centimeters per minute (cc/min) and then calculates the fit factor (FF).

The QuantiFit2 functions by creating and maintaining a negative pressure in the respirator. Once the adapter valve is closed, sealing the respirator, the QuantiFit2 removes air from the respirator until the challenge pressure is reached.

When the challenge pressure is reached, if there isn't a leak, the QuantiFit2 doesn't remove any more air from the respirator. If there is a leak, air enters the respirator. The QuantiFit2 then removes air from the respirator until the challenge pressure returns to the targeted value. This process continues for 8 seconds, and then the test step ends.

During the fit test, the QuantiFit2 measures exactly how much air the instrument removed from the respirator after reaching the challenge pressure. This measurement is equivalent to the leak rate.

Challenge pressure, expressed in inches of H₂O, is the maximum partial vacuum created in a correctly fitting respirator when the user is working at a moderate to high rate. The modeled breathing rate is the calculated total inspiration for one minute.

The modeled breathing rate is expressed in liters per minute (LPM), and is multiplied by 1,000 to provide cc/min, it is then divided by the leak rate in cc/min. This is the fit factor ratio. It is a ratio of the total inhalation pressure to the air that leaked into the respirator.

Fit Factor Explanation

The ratio of the modeled breathing rate to the measured leak rate is the calculated fit factor and is expressed by the following equation:

$$\text{Fit Factor} = \frac{\text{Modeled Breathing Rate (cc/min)}}{\text{Measured Leak Rate (cc/min)}}$$

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

The measured leak rate (MLR) is directly related to respirator fit and integrity. All fit factors are calculated from the MLR. The leak rate is specified in cc/min.

The overall fit factor is calculated by using the harmonic mean of the fit testing steps as follows:

$$\text{Overall Fit Factor} = \frac{N}{[1/FF1 + 1/FF2 + \dots 1/FF_N]}$$

Where:

N = The number of exercises;

FF1 = The fit factor for the first exercise; and

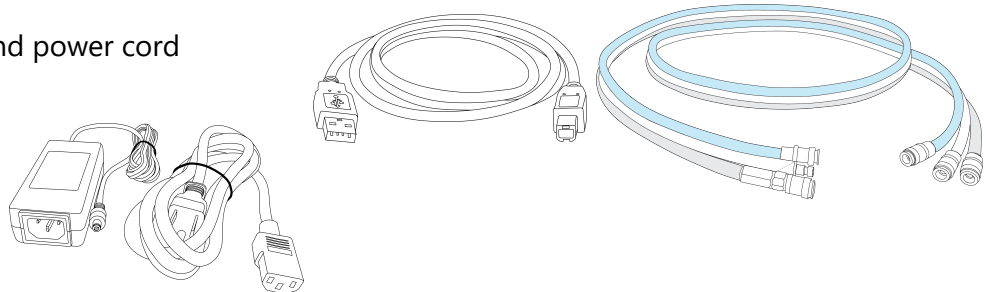
FF2 = The fit factor for the second exercise; and

FFN = The fit factor for the nth exercise

What's Included?

What's included with the QuantiFit2?

- The QuantiFit2 Respirator Fit Tester
- Triple tube set
- Power supply and power cord
- USB cable
- Hard case with extendable handle and wheels

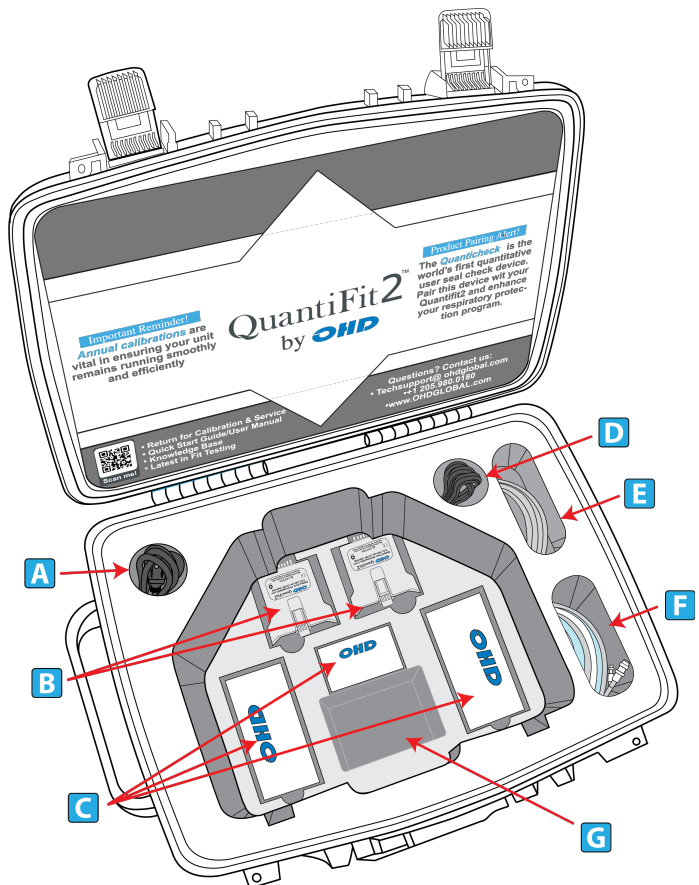


What other accessories are available?

- [Respirator adapters](#) to interface with the QuantiFit2 (required for fit testing)
- Rechargeable battery pack
- External battery charger
- Printer (standard printer and/or card printer)
- USB Keyboard
- Trigger button

The QuantiFit2 Carrying Case

- A. Power cord
- B. Batteries (optional)
- C. Adapters (optional)
- D. Power Supply
- E. USB Cable
- F. Tube Assembly
- G. Additional Storage



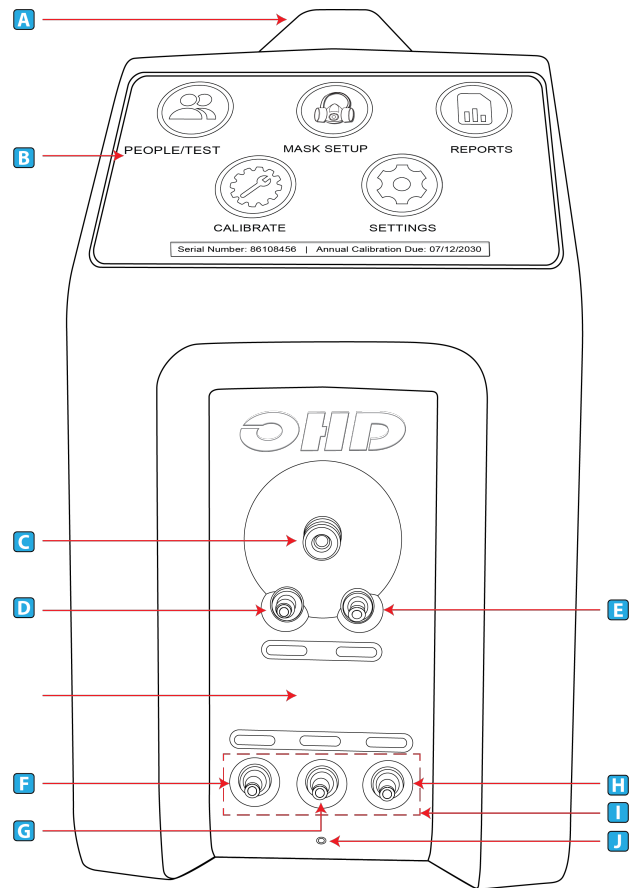
Unpacking

The QuantiFit2 case can contain all of the necessary materials for performing fit tests. There are no consumables required to be purchased or used.

- Release the two latches on the front of the case by depressing a moveable lever under each latch.
- Open the lid of the case
- Tubes and power supply will be found in the oblong cavities of the inner case
- Additional accessories may be stored in the provided spaces at the bottom of the case
 - There is a place for several adapter packages
 - Spare batteries
 - Cords, cables and tubes
- Carefully lift out the QuantiFit2 by holding the handle and the bottom of the instrument
 - Place the instrument on a solid, level surface with ample surface room
 - Connect the power supply into the back of the instrument, and the power cord to a wall outlet (unless using a battery that has been properly charged)
 - Turn on the instrument with the rocker switch on the rear panel
 - Follow the startup wizard (during initial setup only)
 - Follow instructions for Daily Verification Check
 - Ready to test

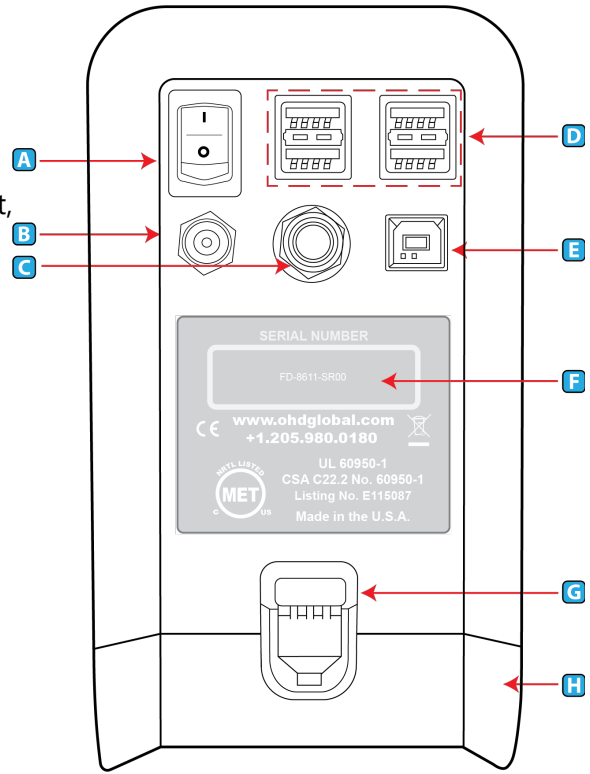
Instrument Front Connections

- A. Carrying Handle
- B. Color Touch Screen
- C. Clear Tube Connection
- D. Gray Tube Connection
- E. Blue Tube Connection
- F. Verification Connection for Gray Tube
- G. Verification Connection for Clear Tube
- H. Verification Connection for Blue Tube
- I. Verification Connections
- J. Instrument Exhaust Port



Instrument Back Connections

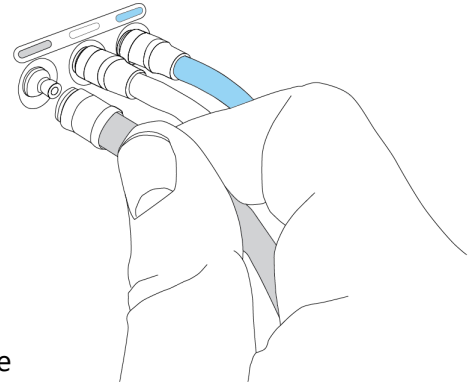
- A. On-Off Switch** - The On-Off Switch functions like a standard power switch. Toggle up (|) and the power is turned on. Toggle the switch down (o) and the power is turned off.
- B. 12 VDC, 3A (max) Power Connection** - The power connection is to supply power to the unit, and the universal power supply that was shipped with the QuantiFit2 must be used.
- C. Trigger Button Connection** - If the optional Trigger Button is used to initiate test steps, it must be inserted into this port.
- D. USB Devices (4)** - The four standard USB ports may be used to connect a Keyboard, printer, USB memory stick, or other useful devices.
- E. USB PC Port** - The USB PC Port is used to connect the QuantiFit2 to a personal computer. The QuantiFit2 is shipped with a supplied cable for this purpose. The USB symbol on the cable must face up to properly insert this cable. This cable allows for the QuantiFit2 to be operated from the supplied software.
- F. Serial Number** - Located in the center, the serial number is important should you require service or support. All records are kept according to the serial number.
- G. Battery Latch** - Push down on this latch to release the battery pack and pull outward to remove it.
- H. Battery Pack (optional) or Cover** - When using an optional battery pack to operate the QuantiFit2, it will be inserted here. When no battery pack is purchased, this cavity will be filled with a blank cover.
- I. Bluetooth Module** (not shown) - When purchased with the Bluetooth function, the QuantiFit2 can wirelessly connect to a computer with Bluetooth capability. The QuantiFit2 allows users to run countless machines simultaneously through the OHD Logic software (as many machines as an operator is capable of overseeing), with flexibility on the start time for any test. Standard Bluetooth allows testing to happen from across the room.



Connecting Tubes

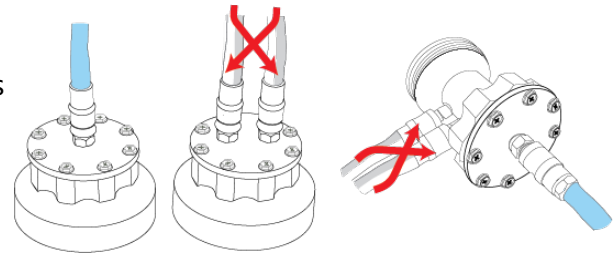
On the instrument

- It is best to connect the metal quick connects while holding onto the tube and not the connection. The metal quick connect will click into place.
- The tubing set consists of three tubes colored blue, gray, and transparent.
- Out of the six ends of the tube assembly, there is only one male connection, which will always go into the large circle on the front of the unit. The other two tubes should be attached to the color-coded ports.
- When performing a daily verification, the opposite ends of the tubes should be matched with the corresponding colors on the bottom row of the front panel.



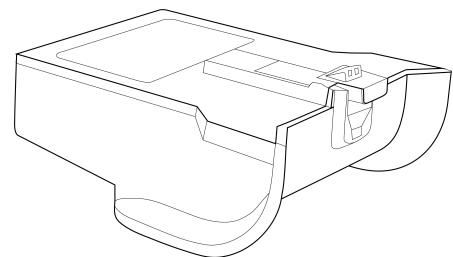
On the respirator

- It is best to connect the metal tubing fixtures while holding onto the tube and not the fixture. The metal fixture will click into place.
- The blue tube will always connect to the single port connection.
- The gray and transparent tubes will be connected to the port connectors that are side-by-side. The two connections are interchangeable on the adapter and can be placed on either port.



Battery

- The optional battery pack will allow the operator to run tests without a power cord whether for convenience or lack of power.
- When a battery is in place, if the QuantiFit2 is plugged into a wall outlet and the building loses power, the battery will automatically take over without any interruption to the fit test.
- The battery may be charged while connected to power whether using the QuantiFit2 or not.
- An optional battery charger is available to charge the battery outside of the QuantiFit2.
- When fully charged, the battery typically yields approximately four hours of normal-use testing.




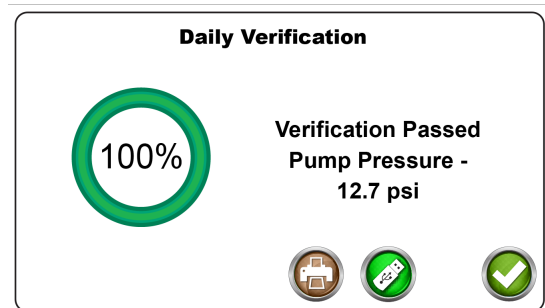
- Lithium Battery Hazards (From OSHA Safety and Health Information Bulletin SHIB 06-20-2019):
 - Lithium batteries are generally safe and unlikely to fail, but only so long as there are no defects and the batteries are not damaged. When lithium batteries fail to operate safely or are damaged, they may present a fire and/or explosion hazard. Damage from improper use, storage, or charging may also cause lithium batteries to fail. Testing batteries, chargers, and associated equipment in accordance with an appropriate test standard (e.g., UL 2054). NRTL certification (where applicable), and product recalls, help identify defects in design, manufacturing, and material quality.
 - Damage to lithium batteries can occur immediately or over a period of time, from physical impact, exposure to certain temperatures, and/or improper charging.
 - Physical impacts that can damage lithium batteries include dropping, crushing, and puncturing.
 - Damage to all types of lithium batteries can occur when temperatures are too high (e.g., above 130°F). External heat sources (e.g., open flames, heaters, etc.) can also accelerate failure in cells with defects or damage from other causes.
 - Damage to lithium-ion batteries can occur when the batteries themselves or the environment around the batteries is below freezing (32°F, 0°C) during charging. Charging in temperatures below freezing can lead to permanent metallic lithium buildup (i.e., plating) on the anode, increasing the risk for failure.
 - Heat released during cell failure can damage nearby cells, releasing more heat in a chain reaction known as a thermal runaway. The high energy density in lithium batteries makes them more susceptible to these reactions. Depending on the battery chemistry, size, design, component types, and amount of energy stored in the lithium cell, lithium cell failures can result in chemical and/or combustion reactions, which can also result in heat releases and/or over-pressurization.
 - In chemical reactions, by-products from the electrolyte solution and electrodes can increase the pressure in the cell to the point where the cell walls expand and by-products leak out. Chemical by-products usually include carbon monoxide, carbon dioxide, hydrogen, and hydrocarbons. In many cases, the by-products are also combustible and could ignite.
 - In combustion reactions, a thermal runaway releases byproducts that may ignite to cause smoke, heat, fire, and/or explosion. The by-products from a lithium battery combustion reaction are usually carbon dioxide and water vapor. In some lithium batteries, combustion can separate fluorine from lithium salts in the battery. If mixed with water vapors, fluorine may produce hydrofluoric acid, which is particularly hazardous because workers may not feel its effects until hours after skin exposure.

Daily Verification

The daily verification is required for each day of testing. The purpose is to confirm that the instrument is working properly.

The daily verification test measures the leak rate of the leak orifice on the triple tube assembly at various pressure levels, and confirms that the diaphragm pump and other processes are working correctly.

See the [8 Daily Verification](#)  section for more information.



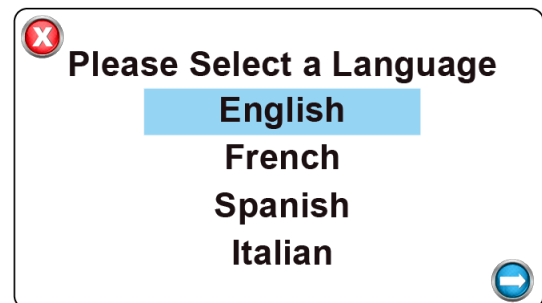
The Startup Wizard will walk the Operator through a few initial settings that are required on the unit. All these settings can be changed in the Instrument Settings section.

Language

- The current languages available on the QuantiFit2 are English, French, Italian and Spanish.
- Additional languages may become available.

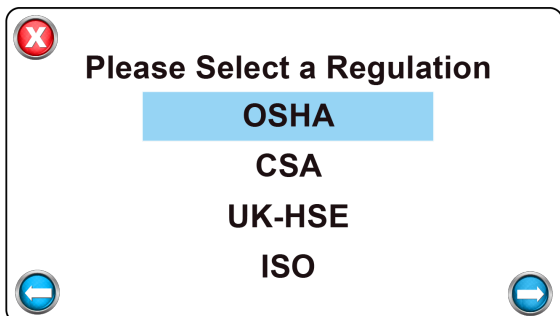
Use PC and/or synchronization to database

- A notification appears to explain that in order to synchronize or merge data onto your PC or other sources, you must first load all people into the included OHD Logic Software and then transfer the data to the QuantiFit2 via a USB thumb drive or the provided USB cable.
 - People that are added directly to the instrument itself might not synchronize or merge with another database.
 - A decision should be made as to whether this data function will be necessary now or in the future so that the synchronizing feature will perform as expected.



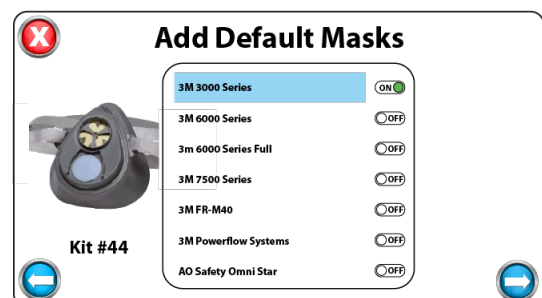
Regulation

- The operator will be required to select the regulation that will be followed for testing in any specific region. This can be changed in the Settings screen if there is a need to switch regulations.
- The regulation controls all the test parameters:
 - The steps and exercises to be followed.
 - Modeled breathing rate, challenge pressure, and minimum passing fit factor for each respirator type.
 - For a more complete understanding of regulations, please see [Appendix E](#) ⁷¹.



Respirator Selection

- Find the respirator(s) that will be used for fit testing, and toggle the on/off switch to on.
- If a particular respirator has not been determined, you may select any respirator and continue. This can be changed later in the Setup Respirators section.

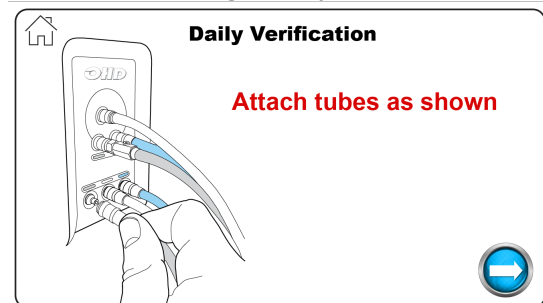


Operator


- For every test performed on the QuantiFit2, an operator must be assigned to the record.
- The Operator screen is used to add/edit operators in the database.
- Enter one or more operator. Additional operators may be added in the Instrument Setup section. [See Setup Operators](#) ³³ for more information.

Daily Verification Check Wizard

- This section will guide the operator through the procedure of doing a daily verification check on the instrument.
- This must be performed every day of testing.
- Upon starting the instrument each day, the Daily Verification screen will appear.
- See the [Daily Verification section](#) ¹⁸ of this manual for more information.



People/Test






- After the instrument check has been performed, the wizard will move on to the People screen.
- People can be added one by one, imported from a list, or added at the time of a test. CAUTION: If the QuantiFit2 data is to be synchronized or merged with the database in Logic software, the list of names must first be transferred into the QuantiFit2 from the software. See instructions in the [software setup section](#) ³⁶. 
- The people screen is the last screen in the setup wizard. The operator may close this window or perform fit tests. See [6 Performing a Test](#) ²⁶ instructions in this manual.

Navigation

The QuantiFit2 is operated by the color display on the front of the instrument.

When pressing any button, there will be a “click-tone.” The volume of this tone can be changed in the System Settings menu.

There are five major modules to select from:

-  **People/Test:** Where people are added, edited, or imported, and where tests are initiated.
-  **Seal Check:** Holding this button will close off the air flow in the respirator so that the test subject can do a user seal check.
-  **Reports:** Reports that can be printed out or exported one at a time, or by date, company, or group.
-  **Daily Verification:** Used to perform the daily verification requirement for each day of operation.
-  **Settings:** Contains parameters that can be changed for the convenience or requirement of the operator.

Buttons: generally, the function of each button is:



ADD – This button will allow the user to add to the records currently viewed, e.g. person, respirator, etc.



OPERATORS - Add/edit operators that will be assigned to testing individuals



ADMIN MENU - Entry to a menu for secure and important settings



PARAMETERS - Settings for customizing mask criteria



CANCEL – This button will close the current screen. Any values entered by the operator on the screen will not be saved.



PEOPLE/TEST – Add/edit people and initiate fit test



CAUTION - This sign denotes a hazard which should be understood before proceeding



PRINT – The print button allows the user to print a report related to the current screen



COMPANY – A separation of people into different groups, teams, companies, etc.



REGULATIONS - Entry to change the regulations that were selected in the Setup Wizard



DAILY VERIFICATION – Will allow the user to perform a daily verification when the initial daily calibration has already been completed



REPORTS – Brings the operator to a section enabling them to print reports by date or company



DELETE – is used to remove an item from a list



DOWNLOAD – For loading people into the QuantiFit2 from the OHD Logic software



EDIT – allows the operator to change information for the selected item



EXIT – Leave the current screen, menu, or wizard



GO BACK – The back button will allow the operator to return to the previous screen



GO DOWN – To move down through a list



GO FORWARD – This button will guide the operator to the next screen in the sequence



GO UP – This button will guide the operator to move up in a list



HELP – Dynamic help according to the screen being viewed



HISTORY – will allow the operator to see recorded information regarding the selected person



HOME - Will bring the operator back to the Home screen



RETRY – When a test step is interrupted, this allows the test subject to retry that step



SAVE – The green checkmark will save the information entered on the screen



SEAL CHECK – Allows the test subject to perform a user seal check



SEARCH – A field available on the People screen that allows a search to quickly and easily find the desired test subject



SETTINGS – Enters the screen with options for changing settings on the QuantiFit2



SETUP RESPIRATORS – Add, edit or delete respirators



SYSTEM INFORMATION – with information including software version, serial number, calibration due date, etc.



SYSTEM RESET – Allows the operator to reset settings to factory default



UPDATE SOFTWARE – Used when an update is available and saved on a USB drive



USB SAVE – Save report or information to a USB drive plugged into the QuantiFit2

People

A Search By: Last Name ☒ ID ☐

B Select Company:

| | |
|-------------------|-------|
| Ebright, Randolph | 12128 |
| Endow, Keith | 68542 |
| Esotiko, Mark | 78546 |
| Ester, Joseph | 75669 |
| Ewan, Christopher | 26798 |

C D E F G H

A. Search

- Test subjects may be searched by last name or by their personal ID.
- Click the radio button to be used for the search. The search will be defaulted to Last Name.
- Press the X at the end of the search bar to reset all search criteria.
- Partial names and numbers may be used in the search. For example:
 - Enter an E in the search, and all those in the database with the last name starting with E will be displayed.
 - When specifying a company and typing in an E, only those names starting with E and within the company selection will be shown.

B. Company

- Company is intended to create a division among the test subjects who are entered into the on-board database.
- To add a company to the QuantiFit2 database, type in a company name when adding a test subject to the database.

A. The company will be saved automatically along with the test record.

B. CAUTION: When entering the name of a company, it is critical that it exactly matches the previous entries, or a new company will be created.



C. Add

- The Add button will open a screen that will require test subject information.
- The fields available are Name, ID, Company, Group and Notes.

Add Person

Name: First MI Last

Employee ID:

Company:

Note:

D. Delete

- When a test subject is selected, press on this icon to delete this person from the instrument.
- There will be a prompt asking if you are sure that you want to delete this person from the database.
- CAUTION: After deletion, a test subject cannot be restored.



E. Download


- The download feature allows test subjects to be uploaded in bulk.
- This can be done through a CSV file from the OHD Logic software.
- See [24 Appendix B: Import Personnel Template](#) ⁶⁷ for import template requirements.

F. History

- When a test subject is selected and the history button is pressed, a screen will show any existing tests for this person.
- Tests will be listed by date.

G. Edit

- When selecting a test subject and pressing on the edit button, there will be an opportunity to change the saved information for this particular person.
- This includes Name, ID, Company, and Notes.





Edit Test Subject

Name:

Employee ID:

Company:

Note:










People

Search By: Last Name ☒ ID ☐

Select Company:

| | |
|-------------------|-------|
| Ebright, Randolph | 12128 |
| Endow, Keith | 68542 |
| Esotioiko, Mark | 78546 |
| Estera, Joseph | 75669 |
| Ewan, Christopher | 26798 |

H. Next

- When a test subject is selected, the Next button will move to the test screen
- To return to the main screen, press on the Home button on the upper left side of the screen.

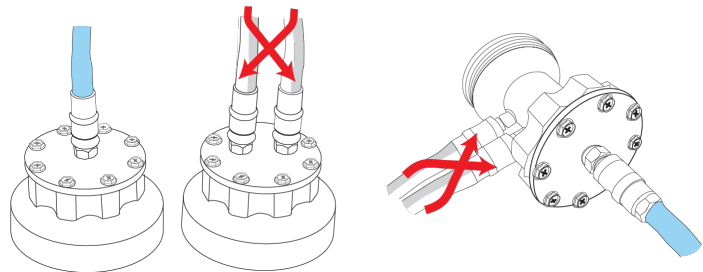
Test Screen

- The test screen prompts the operator or test subject to select or fill in the details of the test.
- This includes Respirator, Size, Operator, and if the respirator used for testing is a surrogate respirator or the respirator actually assigned to the test subject (required only for the HSE regulation).
- The Respirator selection will only show the respirators that have been selected during the setup wizard or in the [9.3 Setup Respirators](#) ³² module on the settings screen.

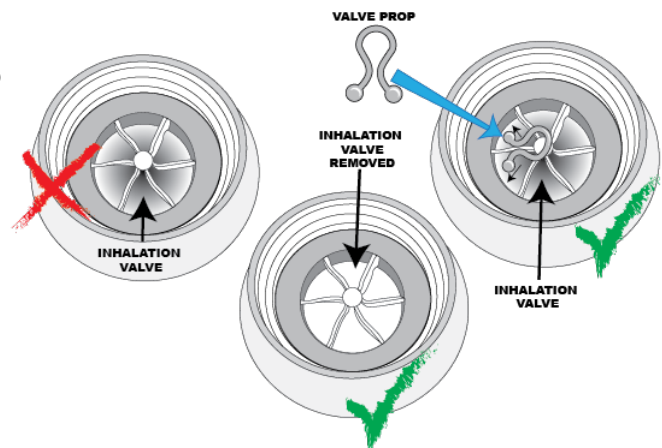
The screenshot shows a user interface titled "OSHA Regulation". It contains four input fields: "Person" with the value "Jack Berry", "Respirator" with the value "Acme Sure-fit", "Size" with the value "Medium", and "Operator" with the value "Arnold Shoefer". Each field has a dropdown arrow on the right. At the bottom, there is a toggle switch labeled "Auto Start?" which is currently turned "on". Navigation arrows (back and forward) are located at the bottom left and right corners of the form.

- **Instructing the test subject:** The general instructions below can teach the operator and test subject basic steps to follow during the fit test. Follow all applicable regional and industry-specific guidelines or regulations.

- If the respirator has an inhalation valve at the place where a fit test adapter will be connected to the respirator, it must be removed or propped open.
- When the test subject is ready, connect the tube assembly to the adapter(s). (For some respirators it is easier to attach the tubes before the adapter is mounted onto the mask, and some are easier before the adapter is mounted onto the mask. Please choose accordingly.)



- The blue tube goes to the single port.
- The gray and clear tubes go to the two ports that are located side by side. It does not matter which tube is connected to which of these two connectors. [See Appendix F](#) ⁷³ for more information.



- **Performing the fit test:** After selecting or adding a person to the database, the test can begin.

- Explain the test to the test subject:
 - This test consists of five steps that will measure any leak into the respirator. (16 steps for HSE regulation.) [See Regulations](#) ⁷¹ for a list of the test steps.
 - During each step, the test subject will be given instructions to be in a specific position for the test, and a possible action to perform before the test step begins.
- Initiating the test step:
 - If the auto-start feature is turned on:
 - Instruct the test subject to take a comfortable breath and hold it when the circle in the lower right corner turns green.
 - The test will begin automatically.
 - If the test does not start automatically, depressing the green button will initiate the test.

Performing A Test

- Remain still for the duration of the test.
- If not using auto start,
 - Instruct the test subject to take a comfortable breath and hold it, and then press the green button on the screen
 - Remain still for the duration of the test.
- At the end of each step, a fit factor will show for several seconds.
 - If the fit factor is greater than the minimum fit factor required, the instrument will advance to the next step.
 - If the test should fail for reasons other than a poor fit (test subject coughs or laughs, the test starts when the test subject was not ready, the tubes were not connected, etc.), the step may be retried.
- If the signature feature is enabled, the test subject will sign on the screen with a finger or an optional stylus.
- At the end of the test, the results are saved into the database and cannot be edited. The operator may choose to print the test results immediately or wait to print at a later time. The test is stored and able to be accessed at any time.



Reports may be printed at the time of the test, or any time after the testing has been completed.

The following reports are available on the QuantiFit2:



○ Individual Fit Test Report

- A single-page report that contains all required data for a respirator fit test record.
- This report includes a fit test card at the bottom of the sheet for the test subject to keep.
- Fit test reports can be selected by:
 - A company
 - An individual person
 - Tests that fall within a specific date range

○ Summary Fit Test Report

- A report that will print the specified group of people in a truncated fashion, which allows for many people to be recorded on the same sheet.
- Fit test reports can be selected by:
 - Company
 - An individual person
 - Tests that fall within a specific date range

○ Daily Verification Reports

- Quick selections include:
 - Today
 - Current week
 - Last week
 - Previous week
 - Current month
 - Previous month
 - Custom date(s)

○ Print/Export Reports

- The reports be:
 - Saved as a PDF file, CSV file, or both

- Printed directly to an approved printer

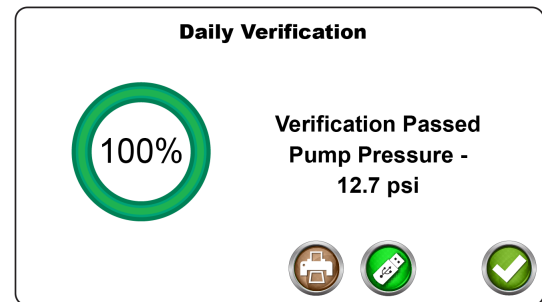
Individual Fit Test

Fit Test Summary Report

Verification Report

The daily verification is required for each day of testing. The purpose is to confirm that the instrument is working properly.

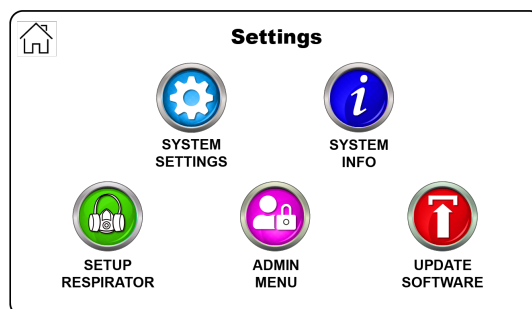
When turning on the instrument for the first time each day, the Operator will first be prompted with the daily verification message. Once the daily verification has been performed for the day, this message will no longer appear when the unit cycles power.



The daily verification test measures the leak rate of the leak orifice on the triple tube assembly at various pressure levels, and confirms that the diaphragm pump and other processes are working correctly.

The daily verification may be performed at other times for other purposes. A Daily Verification button can be found on the QuantiFit2 Home Screen.

- Run a daily verification when the instrument moves to another location, especially with any environmental changes.
- Run a daily verification whenever the triple tube assembly is changed.
- Troubleshooting:
 - If the instrument passes the daily verification, this confirms that the QuantiFit2 is working properly.
 - If the instrument does not pass the daily verification, troubleshooting information will be displayed.
 - If the verification will not pass after troubleshooting steps, the unit may require service. Contact OHD technical support (techsupport@ohdglobal.com).



System Settings

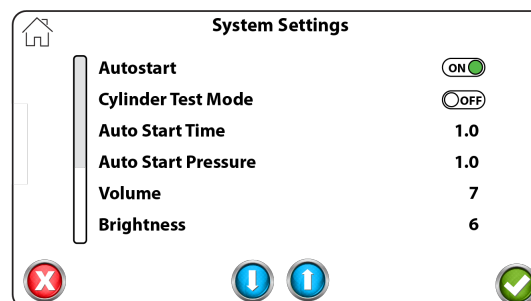
Auto Start

- Auto Start is turned on by default.
- When this feature is turned on, the QuantiFit2 assesses when the test subject is ready for the test to begin.
- The test subject takes in a breath and holds it until the circle in the lower right corner turns green.
- The test automatically begins.
- When this feature is turned off, each test step would initiate as soon as the operator or test subject touches the check mark on the test screen.



Volume allows the operator to increase or decrease the volume of the audio indicators that one might hear when testing or entering test data. The settings are 0 to 10, where 10 is the loudest.

Brightness allows the operator to increase or decrease the brightness of the display. The settings are 1 to 10, where 10 is the brightest.



Auto Print is turned on when the operator desires the test automatically to be printed upon completion of a fit test.

Number of Prints allows the operator to select the number of prints when printing reports. To be used when more than one copy is required.

Auto Advance

- When turned on, the auto advance feature will automatically advance to the next step after a step has passed successfully.
- If the test step fails for any reason, the operator will be given the option to retry the step or advance to the next step.
- When the auto advance is turned off, the operator must select the arrow button for the next step, or the retry button when a retry is necessary.

Auto Advance Time allows the operator to set the time given before the test step advances to the next step when the auto advance function is turned on.

Redon Delay is the number of seconds to delay the QuantiFit2 while the test subject redons the respirator so that auto start is not analyzing samples while the redon is taking place.

Signature Capture allows the operator to turn off the signature capture at the end of each test if the signatures are not necessary or required.

System Info

The information button will display helpful information when contacting OHD for support.

- **System Version** – The current version of on-board software
- **Cycle Count** – The number of cycles the instrument has run
- **Calibration Due Date** – The date due for annual calibration requirements
- **Current Date** – Can be changed by touching the current value
- **Current Time** – Can be changed by touching the current value



Setup Respirators

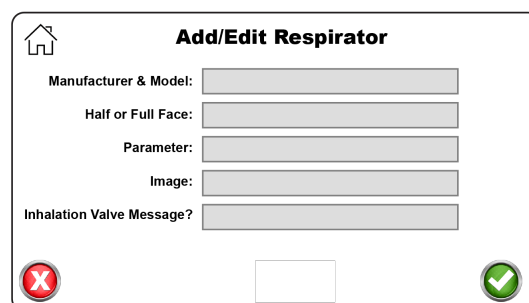
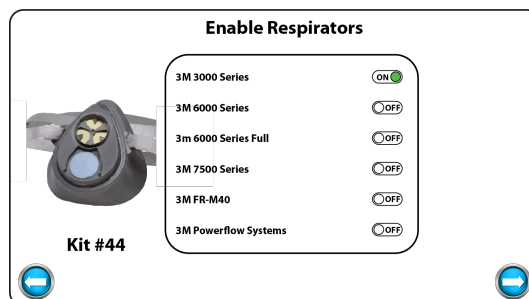
The QuantiFit2 is populated with an extensive list of respirators.

When selecting respirators, only those turned "on" will be available as a selection on the Test Information screen during a fit test.

If the respirator that is being tested does not appear on this list, a new respirator may be added to the list. The following fields will be required:

- Respirator manufacturer and model
- Half or full face
- Parameter or type or how mask is used
- An image can be uploaded into the database from a thumb drive.

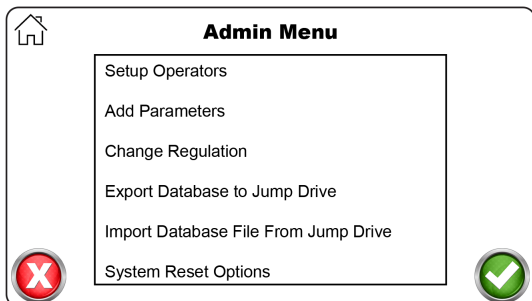
- When no image is uploaded, "No Image Available" will be shown in place of the image.
- The respirator image should be no larger than 240 pixels wide by 370 pixels tall.
- The respirator image should be a *.png file.



- Turn off the message about the inhalation valve if this particular respirator does not have an inhalation valve that interferes with the test

Admin Menu

The Admin Menu is a directory for settings that could potentially cause unwanted changes to the QuantiFit2. These settings should be changed only by a person who has been trained and understands the purpose of each setting.



Setup Operators

- Operator setup is necessary to record those people who will be running the tests.
- If security is turned on, the operators entered into the database either will be an Administrator or Operator.
- The Operator will have limited access to the system as determined by an Administrator.
- To record an Operator, there are key fields required:

- First and Last Name
- Email
- Pin
- Admin or not

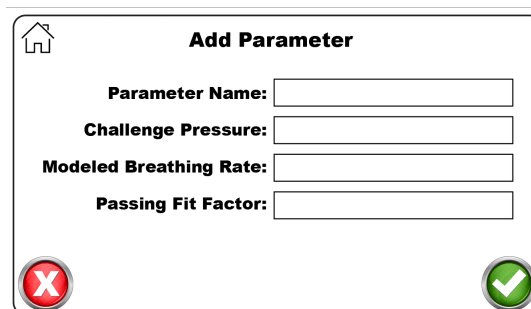
- An Administrator can access any part of the QuantiFit2.
- The Operator is limited to specific areas that are defined by the Administrator.
- There may be more than one Administrator.

Add Parameter

The Add Parameter function will allow an operator to customize options for a particular respirator if the desire is to test outside of the approved testing parameters.

- Parameter Name: Create a name that will relate to the parameter

- Challenge Pressure: The negative pressure rate at which a respirator is challenged
 - 0.58 is used in the APR parameters
 - 1.0 is used for CBRN and military function
 - 1.5 is used for SCBA respirators for a maximum challenge
- Modeled Breathing Rate: The breath that is emulated during the fit test
 - 0.53 is used for APR settings
 - 0.59 is used for CBRN and military function
 - 0.93 is used for SCBA respirators
- Passing fit factor: The minimum fit factor required in order to pass a test step and overall fit factor.



Add Parameter

Parameter Name:

Challenge Pressure:

Modeled Breathing Rate:

Passing Fit Factor:

Buttons: [X] [✓]

Change Regulation

The QuantiFit2 is designed so that when a regulation is selected, all tests are automatically executed with the correct settings. New regulations will be added in future updates as they become available or are modified. For a more detailed explanation and description of the regulations, please see [Appendix E ⁷¹](#). The current regulations include:

- **OSHA** (Occupational Safety and Health Administration - US)
- **CSA** (Canadian Standards Association - Canada)
- **UK-HSE** (Health and Safety Executive - UK)
- **ISO** (International Standards Association)

System Reset

There are numerous reset options according to which information needs to be reset.



System Reset Options

Clear People List ☐

Clear Test Records ☐

Clear Operators ☐

Clear Custom Parameters ☐

Restore System Defaults ☐

Reset to Factory Settings ☐

Buttons: [X] [✓]

Clear People List will remove all of the people in the current database. This would be helpful if another entity will use the QuantiFit2, or to upload a fresh list of names for a new year of testing.

Clear Test Records will keep the people list, but will delete all test information. This would be helpful if only the current year's tests are required to be on board.

Clear Operators will remove all operators listed in the unit.

Clear Custom Parameters will remove any parameters that have been manually added to the database.

Restore System Defaults will change all operational settings to the settings that were originally implemented on the instrument. This option will not erase any of the information listed above.

Reset to Factory Settings will remove all data on the Quantifit2 and it will operate as though it is the very first time the unit is powered up.

Update Software

- Occasionally there will be updates to the on-board software.
- OHD will notify customers when an update is available, if the unit has been registered.
- The notification will come via email.
- The update can be downloaded from a website and saved to a USB Drive.
- With the USB Drive in any port on the back of the instrument, the Update Software button will ask the operator to select the update file.
- After the update, the instrument will automatically cycle power at the appropriate time, reboot the system, and be ready for testing.



Logic

OHD Logic Software is intended to be driven by icons, and each icon function can be viewed by mousing-over the icon. In the case of the icons on the left sidebar, the Menu icon at top left can be clicked, and the menu will pop-out to display the names next to each icon.

As with most programs, there are many ways to do the same task, and different operators may feel more comfortable doing things one way as opposed to other ways. These instructions will cover the different ways to do each item or task.

If there are uncertainties about any particular part of the software, check the corresponding section in this manual or in the software. Most tasks are performed quite easily, but there is much depth to OHD Logic that many users will never require.

Our goal is to make this software as intuitive as possible. We always welcome feedback.

OHD Logic Software is to be installed on a PC running Windows software version 10 or greater.

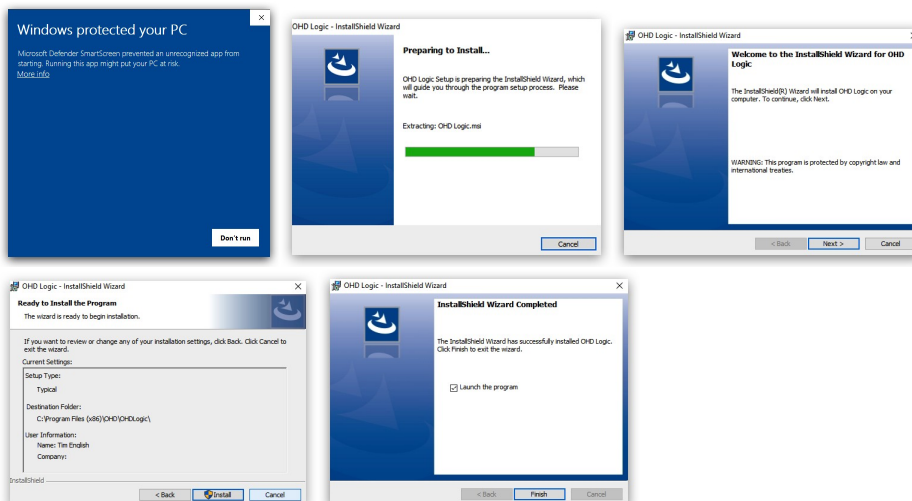
PC requirements:

- Processor Speed: 1.0 GHz or greater
- RAM: 1 GB or greater
- Disc Space: 16 GB

The installation must be completed by someone logged onto the PC who has administrative privileges.


The installation file will install all prerequisite files including Windows requirements.

1. You may have to approve the installation of this file as it might be one that Windows doesn't recognize, or if you downloaded it from our website.
2. Accept the license agreement (can be found in Appendix G).
3. Follow the install wizard and launch the program.



1. Wizard Introduction
 - a. Explanation and Instructions for setting up Logic
 - b. These settings can be implemented or changed at any time
2. Select Language
 - a. Select the appropriate language
 - b. Language can be changed at any time in the Setup menu
3. Select Regulation
 - a. Select the regulation required for fit testing in your location
 - b. See [Appendix E](#) ⁷¹ for more explanation on regulations
4. Select Respirators
 - a. The list contains all respirators currently in use
 - b. Toggle the on-off switch, and those respirators turned on will appear as a choice when performing a fit test
 - c. If the respirator required is not found, it can be added later in the Respirator section of Settings (Notify OHD of a respirator not found in the list, techsupport@ohdglobal.com)
5. Security Settings ([See Security Settings](#) ⁴⁹)
 - a. Security will give control over access to the software as well as the ability to change settings.
 - b. If security is not turned on, anyone will have access and be able to make changes to the software.
 - c. There are two roles, the Admin and the Operator. The Operator is able to perform fit tests, but the Admin will be able to make changes to the software
6. Add Company
 - a. A company is used to separate groups of people
 - b. There might be only one company needed, or dozens of companies can be used.
7. Add People
 - a. People can be added at this stage of the wizard by typing them in one by one
 - b. The People tab in Settings allows for a list of people to be uploaded into the database.
See [Appendix B](#) ⁶⁷
8. Add Quantifit2
 - a. In order to use the Quantifit2 through OHD Logic software, it must first be registered to the software
 - b. The Quantifit2 must be powered on, and the connection may be by either Bluetooth or USB cable
 - c. The registration is a one-time occurrence and will not be required again
 - d. If a device is not available at this time, it can be added in the Settings section at a later time
9. Summary of details
 - a. A review of the setup details
 - b. Items may be changed by clicking on the back arrow (left arrow)



OHD Logic software will be updated periodically to enhance features, add features, or fix bugs. In the [Settings](#)  section, there is an option to automatically receive updates. If this is not turned on, whenever the Update menu is selected, the software will check to see if an update is available and there will be an option to update or not.

Software updates will typically install "on top of" the current installation and an uninstall will not be required. However, if an uninstall is required for any reason, this will not affect the database. It is best practice with any software to back up data when updating or uninstalling a program.

After initial setup, most people can do any task required directly from the Home Screen. This includes running tests, adding people, adding respirators, viewing test statistics, and identifying those people who are due for testing.

Each of the modules seen on the Home Page can be collapsed by clicking on the no-view icon. When doing this, the module will become a button that goes to the right-most edge of the viewing screen. These modules will still be in operation, but they won't clutter the screen if they are not used regularly.



The top bar of the software displays the name of the section (Home Screen), the selected company, and the operator that is currently logged in (when the security feature is enabled). The company can be changed at any time, and if security is activated, the operator can log out of the software.

Test Creator: OSHA

Operator

First Name _____

Last Name _____ ☐ Remember

Company: OHD

Subject: _____ +

Respirator: _____ +

Size: _____

Quantifit: _____

Add person to OHD

Standard Fields

Personnel ID _____

First Name _____

Last Name _____

Middle Initial _____

Last Fit _____

Notes _____

PPE Steel Toe ☐ inactive

Custom Fields

Med Review _____

Glasses? Yes _____ No _____

Save Cancel

Past Due Viewer

☐ Hide Never Tested

| First Name | Last Name | Elapsed Due | Last Respirator |
|------------|-----------|--------------|-----------------|
| James | Jefferson | Never Tested | ... |
| Lonnie | Amsterdam | Never Tested | ... |
| DAVID | DONALD | Never Tested | ... |
| Larry | Lance | Never Tested | ... |
| Kyle | Austin | Never Tested | ... |

Test History

Previous Tests

No Tests

Test Statistics

| Title | Total | Pass | Fail | Incomplete |
|---------------|-------|------|------|------------|
| Today | 0 | 0 | 0 | 0 |
| Current Week | 0 | 0 | 0 | 0 |
| Current Month | 0 | 0 | 0 | 0 |
| Current Year | 0 | 0 | 0 | 0 |

Q2 Viewer

Registered Quantifit's

No Registered Units

Test Creator

To perform a fit test, it must be launched from the Test Creator. The Test Creator is a simple guide to record pertinent test information and to initiate the test.

○ Operator


- Add first name and last name to the operator selection.
- Check the "Remember" box if the name is to be remembered throughout the current testing session.
- When "Remember" is not checked, an operator's name would need to be input for each test.


○ Company

- Select the company from which the testing is to be performed.
- The company can also be selected in the title bar of the Home Screen.

○ Subject

- Put the computer cursor in this field, and begin to type a person's name (first name, last name). There is a lookup that matches names letters are entered.
- When the correct person appears in the field, move on to the respirator selection.
- A person may also be found by using the field's drop-down arrow, and scrolling through the list of names.
- If the test subject does not appear in the list of names, click on the "+" symbol to add a person. This will bring up the Add Person screen if that screen is not already opened.
- When the information has been added and the Save button is clicked, the added name will appear in the Subject field.

- Respirator
 - When selecting the Respirator drop-down menu, those respirators that were enabled in the [Respirator](#)⁵¹ section will be visible.
 - A respirator may be added by clicking on the "+" button, which will open the Respirator Management screen.
 - Click on the toggle switch to add a respirator to the available list. 
 - Select a size from the drop-down menu.
- QuantiFit2
 - Use the drop-down menu to select the instrument you want to use for testing.
 - If a QuantiFit2 has not been registered to the software, this will need to be done through the Settings/Devices menu.
 - If only one unit is registered, this field will be populated with that instrument.
 - If there is more than one instrument registered, this field will remember the last one used.

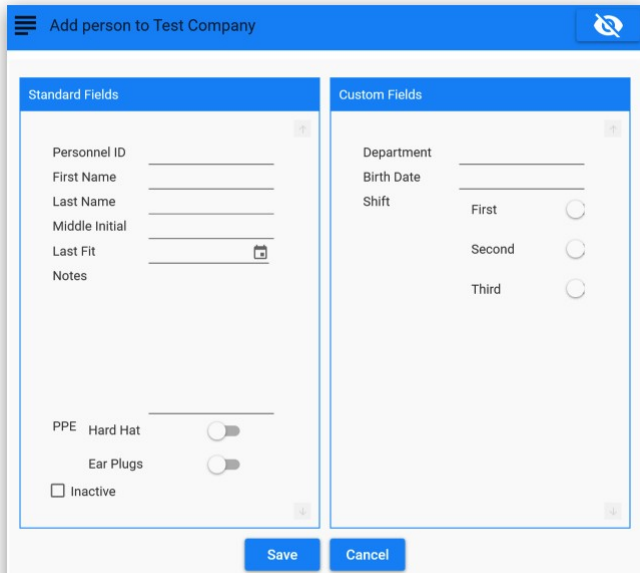


A screenshot of a drop-down menu labeled "QuantiFit2". The menu is open, showing a list of options, though the text is too small to read. The menu has a blue header and a blue border.

Add Person

There are various ways to enter people into the software for testing. For larger groups of people, it might be most effective to import a list of people through the Import/Export feature in the Settings/Data section. Another way is through the People section. But people may also be entered in this module on the Home Screen.

- The name is required, but other fields are optional according to how the data is required by the organization.
- PPE options are set up under the Company record, and will record the PPE assigned to this person.
- The optional fields shown in a second column -- if they have been modified or changed -- are regulated under the [16 Company](#)⁴⁶ record.
- Three types of custom fields can be added for record keeping:
 - Field - which would have a blank field to be filled in.
 - Date - for selections such as birth date, date of hire, etc.



A screenshot of the "Add person to Test Company" form. The form is divided into two main sections: "Standard Fields" and "Custom Fields".

Standard Fields:

- Personnel ID (text input)
- First Name (text input)
- Last Name (text input)
- Middle Initial (text input)
- Last Fit (text input with a calendar icon)
- Notes (text area)
- PPE Hard Hat (toggle switch)
- Ear Plugs (toggle switch)
- ☐ Inactive (checkbox)

Custom Fields:

- Department (text input)
- Birth Date (text input)
- Shift (radio buttons):
 - First (selected)
 - Second
 - Third

At the bottom of the form are "Save" and "Cancel" buttons.

- List - when predetermined selections are required.
 - The list can be modified at any time. If a field is removed, the data contained in that field will not be deleted, and can be seen if that field is activated again.
 - See the list options under the [16 Company](#) ⁴⁶ section of this manual.

Past Due Viewer

This tool allows the operator to quickly view those who are due for a test.

The list will show any person in the database who is within a month of needing testing.

By default, the "Hide Never Tested" box is left unchecked. In addition to those due for testing, the list will also contain those people in the database who have never been tested. The people who have never been tested can be hidden from view when checking this option.

| First Name | Last Name | Elapsed Due | Last Respirator |
|------------|-----------|--------------|-----------------|
| James | Jefferson | Never Tested | --- |
| Lonnie | Amsterdam | Never Tested | --- |
| DAVID | DONALD | Never Tested | --- |
| Larry | Lance | Never Tested | --- |
| Kyle | Austin | Never Tested | --- |

Previous Tests

| Person | Fit Factor |
|-----------------|-------------|
| Larry Mogley | -2147483648 |
| Fred Flintstone | -2147483648 |
| Larry Mogley | 415 |
| Fred Flintstone | 207 |
| Jerred Heney | 1662 |

This module will contain a list of tests listed in the order in which they were performed and recorded.

Test Statistics

Test Statistics will show a quick snapshot of current testing. This includes records of tests that are passed, failed or incomplete. Tests will also be categorized between the current week, month, and year.

The current week begins with Sunday and ends with Saturday. The current month begins with the first day of the month, and the current year begins January 1.

| Title | Total | Pass | Fail | Incomplete |
|---------------|-------|------|------|------------|
| Today | 0 | 0 | 0 | 0 |
| Current Week | 0 | 0 | 0 | 0 |
| Current Month | 0 | 0 | 0 | 0 |
| Current Year | 13 | 3 | 2 | 8 |

People

The people list shows the people in the currently selected company who have not been made inactive. The All Companies box can be checked for a list of people throughout all companies.

Users can be made inactive if they have left their position, or no longer require fit testing. Their records will not be deleted, but they will be hidden from view. To reactivate a person, click on "Show Inactive," select the person, and click on the Toggle Active button.

People can be added or edited on this screen. The plus sign will bring up an Add People screen, while the edit button will allow the currently selected person's record to be edited.

The search field can contain any combination of letters that appear in someone's name, and that person will show up in the list.

- Typing ian will bring up anyone named Ian, as well as Brian.
- Typing Brian will bring up only those people named Brian.
- Typing B will bring up anyone with a "B" as a part of their name.

| ID | Last Name | First Name | M.I. | Last Fit | Notes | Inactive | Med Review | Glasses? |
|--------|-----------|------------|------|----------|-------|--------------------------|------------|----------|
| 56445 | Amsterdam | Lonnie | | | | <input type="checkbox"/> | | |
| 66254 | DONALD | DAVID | | | | <input type="checkbox"/> | | |
| 987987 | Jefferson | James | | | | <input type="checkbox"/> | | |

- Many QuantiFit2 users will have only one company, while others might have dozens, depending on the needs for testing.
- The purpose for a Company is to create a division within the database.
 - The company name will appear on the top of the fit test reports.
 - Company divisions are not necessary and are only for convenience.
 - The number of people that can be listed in a company is virtually unlimited.
 - Examples for company use:
 - If a mobile tester has 200 clients, he can divide the people lists between those 200 companies.
 - If a company wants to divide people into groups according to which location or building a person works in.
 - A shared instrument can have a company for each entity that is using the instrument.
 - A person can be transferred to any existing company.
- Add Company Screen
 - The required field is the company name, the rest is for record keeping
 - Add PPE that might be assigned to the individual
 - Custom fields include fields, dates, and lists
 - A field is an open text box
 - A date will show a calendar
 - A list allows the operator to create list items which permit multiple selections

The test screen is where any active test can be viewed. This may be one test, or it may be for an operator who is controlling multiple instruments. The QuantiFit2 allows users to run countless machines simultaneously through the OHD Logic software (as many machines as an operator is capable of overseeing), with flexibility on the start time for any test.

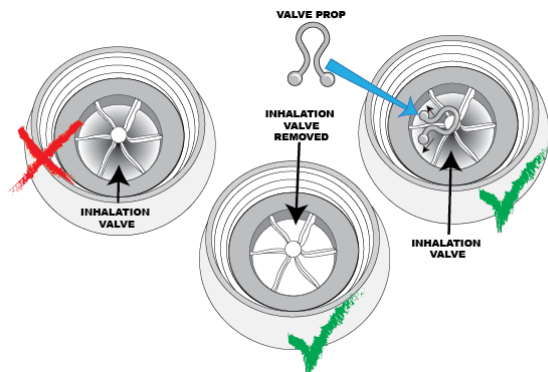
This screen also contains a Test Creator to begin new tests while viewing current tests.



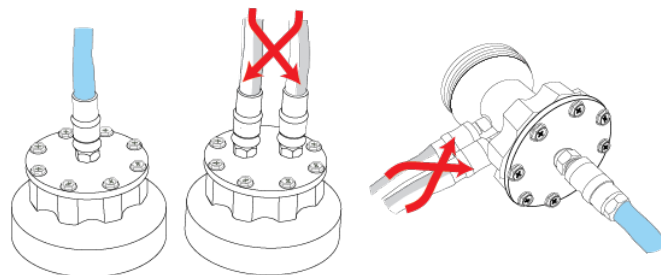
The testing sequence

○ When initiating a test from Logic software:

- The software will display the inhalation valve message reminder.
- Then the software will display the tube connection instructions.
- The previous two screens can be turned off by checking the box next to "Hide these messages next time."



- The test subject will view a message that says, "Device is in remote mode. Please wait until the Operator sets up the test."
- If the daily verification check has not been completed for the day, the QuantiFit2 will prompt the user to perform this check.



- When the test is initiated, the test subject will see "Please review this information. If correct, press the blue arrow to continue." (Name, size respirator, parameter, surrogate)
- Test subject will then follow on-screen instructions to complete the test.

○ If a test step should fail for any reason

- The operator will be notified on the software test screen, and be given an option to retry the step or save it (if a fit factor was calculated).
- There are some troubleshooting suggestions that can be seen by clicking on the question mark in the upper left of the test screen next to the Delete button.
- See the [20 Troubleshooting](#) ⁵⁴ section for more information.

Security

The security mode is turned off by default but can be enabled at any time.

- Click on the check box, and a message will appear to make sure it is intentional that the Security function is being turned on.
 - If the Security feature was used in this database at any time in the past, then Administrator(s) will already exist. (If this is the case, make sure the administrator credentials have been recorded and are accessible.)
 - If no Administrator was ever created, the operator will be given an option to create a login.
 - After the login is created, the user immediately will be required to log in to use the software.
 - After the Security is turned on, and an Administrator is logged in, the Administrator can then add other Operators and/or Administrators.
- Administrator vs. Operator
 - When Security is activated, to gain access to the software, a person will need login credentials. These credentials either will be assigned to Operator or Administrator status.
 - Operator status allows a person to log into OHD Logic and run tests, reports, add people, and all of the regular functions of a fit testing program.
 - Administrators are unique from Operators in that Administrators can gain access to all of the setup items.
- If the password is lost or forgotten and nobody can gain access to the software or to the Settings functions, OHD must be contacted, +1-205-980-0180, techsupport@ohdglobal.com. The person requesting login information must be able to prove that they have authority to control the software (as determined by OHD's tech support team). OHD claims no liability as to the privacy of a customer's data.

Options

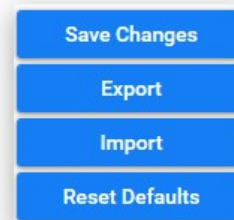
The options section offers flexibility as to how the software operates.

The screenshot shows a settings window with the following options:

- Default View:** A dropdown menu currently set to "Dashboard".
- Base Theme:** A toggle switch between "Light" (selected) and "Dark".
- Select Regulation:** A dropdown menu currently set to "OSHA".
- Allow Auto Updates:** An unchecked checkbox.
- Login Timeout:** A dropdown menu currently set to "Off".
- Date Format:** A dropdown menu currently set to "12/02/2020".
- Allow Reporting:** A checked checkbox with a message: "Thank you for reporting errors so we can continually improve our product." Below it is a blue button labeled "Report Errors".
- Valve Prop Messages:** A toggle switch currently set to "On".
- Default Autostart:** A toggle switch currently set to "Off".

- **Default View** allows the Administrator to select which main screen should be shown when the software is launched.
- **Base Theme** allows the Administrator to change the software view to light mode or dark mode.
- **Select Regulations** allows the operator to choose a testing regulation other than the one that was selected upon initial setup. See [27 Appendix E: Regulations](#)⁷¹ for more information.
- **Allow Auto Updates** will cause the software to check for updates each time the software is opened .
- **Login Timeout** is defaulted to Off. By selecting a time increment, this will determine how long the software can remain untouched before it automatically logs the Operator or Administrator out.
- **Date Format** allows the Administrator to select the type of date format preferred. (MM/DD/YYYY, DD/MM/YYYY, YYYY/MM/DD)
- **Allow Reporting** When this feature is allowed, the software will send errors to OHD. This will help OHD to continue to refine the software, and it may help with troubleshooting issues.
- **Valve Prop Messages** will universally turn the valve prop message on or off regardless of respirator being used.

- **Default Auto Start** Each time a test starts, it will always default to using the auto start feature unless this option is not turned on. If the features is not turned on, it will remember the last used setting.
- **Save Changes** to make sure that any changes will take effect.
- **Export** will allow the Administrator to export these default settings and Import them into another database on another PC.
- **Restore Defaults** will change the above settings to the way that they were upon the initial install of OHD Logic.

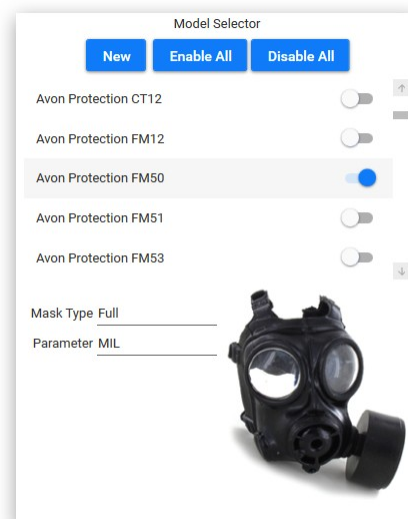


Respirators

Respirator List

OHD Logic Software comes with a pre-populated list of respirators. Every effort is made to keep this respirator list up to date, but if a respirator that is being used does not appear on the list, it may be added. OHD would like to be notified if a respirator is not listed (techsupport@ohdglobal.com) so that we may update our list, which will be distributed to our customers as updates are completed.

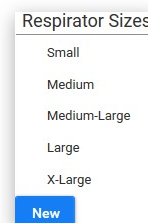
- Find the respirator manufacturer and model that will be used for testing, and turn that selection on with the toggle switch.
- When a respirator is turned on, it will become part of the selectable respirator list when performing a fit test.
- When respirators are no longer being used, the respirator may be "turned off." This will in no way affect previous tests that have used this respirator.
- To create a new respirator:
 - Click on the New button.
 - Type in the Manufacturer and Model Name.
 - Select Type of respirator (APR-Half, APR-Full, PAPR, Gas respirator, and SCBA). Each respirator will have different testing parameters according to which regulation has been selected for your testing. [See Appendix E](#) ⁷¹ for more information.
 - An image may be uploaded so that the respirator can be seen when selected. The image target size ideally should be 240 X 370 pixels, or it will be sized when importing.



Respirator Sizes

The default respirator sizes that are pre-programmed into the software include: Small, Medium, Medium-Large, and X-Large.

The respirator Sizes module allows the operator to add additional respirators sizes if the need should arise. This could include sizes such as One-Size-Fits-All, X-Small, etc. The operator may also delete sizes of respirators that are not a size used by a specific respirator manufacturer. This would prohibit operators from selecting the wrong size by mistake.



Parameters

Parameters define how each respirator type is tested. Upon initial setup, a regulation was selected. This selection can be changed in the settings. For a complete list of regulations, see [Appendix E](#).

| Respirator Protocols | |
|----------------------|------------------------------|
| Protocol Name | Details |
| APR Half | Protocol Name: SCBA |
| APR Full | Challenge Pressure: 1.5 |
| MIL | Modeled Breathing Rate: 93.1 |
| SCBA | Minimum Pass Half: 500 |

Select the mask type, and the appropriate parameters will be displayed.

If for some reason, a change is needed for a specific regulation (minimum passing fit factor, challenge pressure, etc.), An Administrator can create or duplicate an existing regulation, and make the required changes. This is highly discouraged as the regulations are in place as required. Regulations will be added or modified to the software when changes or updates become available. The new regulations will be distributed in an updated version of the software.

Update

When clicking on the Update icon, The software will give a notification stating whether there is a software update available or not. In the Setup section of the Setup options, there is an option to turn on or off the ability for the software to automatically update. With the auto update turned on, whenever there is a new release, the operator will be prompted to confirm that he or she wants the update to occur.

About

In the About section, information is included for:

- **OHD Contact Information**

Address: 2687 John Hawkins Pkwy, Hoover, AL 35244, USA

Phone: +1-205-980-0180

Website: www.ohdglobal.com

Email: sales@ohdglobal.com, techsupport@ohdglobal.com

- Software version
- Quick Links to useful websites

There are several types of reports that can be produced from OHD Logic.

- Fit Test Report:

The report that would print at the end of a fit test which contains all of the pertinent information to be recorded for an individual test.

- Fit Test Summary:

A report including the summary for a selected company or a specific period of testing.

- People Report:

A print-out of all people in the database, or in a selected company.

- Fit Test Card:

This report will print to a card printer so that people may carry a record of their fit test.

- Due for Test:

A list of people who are due to be tested, according to the criteria that the operator puts in place.

- Daily Verification Summary:

A report for the current day's verification or a date range of daily verifications.

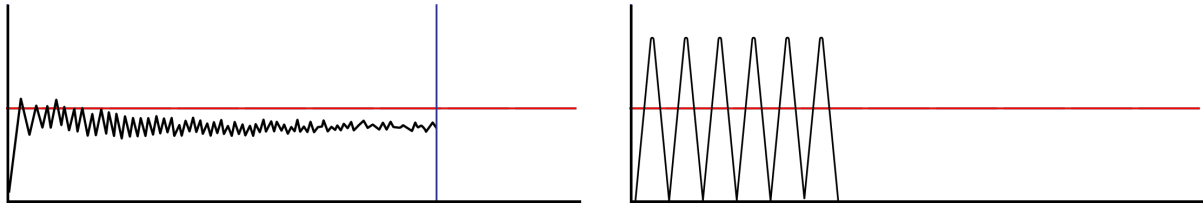
The screenshot shows a web-based interface for generating reports. At the top, there are filters for 'Company' and 'Subject', both with checkboxes and dropdown menus. Below these is a 'Date Range' section with a date picker set to '9/1/20' to '12/11/20'. A message '0 Matching Tests Found' is displayed. Below the message is a table with columns: 'Date/Time', 'Full Name', 'Fit Factor', 'Status', and 'Company'. At the bottom, there are three buttons: 'Summary Report', 'Individual Reports', and 'Open Report Folder'.

When a report is saved, it can be found as a PDF inside the Reports Folder. Click on the button to open the Reports Folder. By default, this can be found at: This PC:\Documents\OHD\OHD Logic\Reports.

Graph Behavior

The way the traceline of the graph displays during a test may be very helpful to understand a test step. Below you will find images with common traceline drawings.

Inhalation valve not removed or propped open

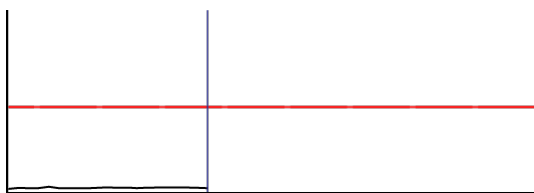


When the inhalation valve is interfering with the fit test, this is what the traceline will look like. On the adapter side with the two tubes attached, the airway needs a clear path into the respirator. If the way is not clear, the above graph will appear.

1. The inhalation valve can be propped open from the outside of the respirator before the adapter is connected.
2. Use an OHD valve prop to remain opening the valve during the fit test.
3. If a valve prop is not available, other materials may be used such as a piece of drinking straw, folded paper, etc. Take care not to damage the valve when inserting an object to prop it open.
4. For some respirators, it might actually be easier to remove the inhalation valves before the test, and then replace them at the end of the fit test.

OSHA 1910.134 Appendix A, 6.(a)(4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

Large leak is measured

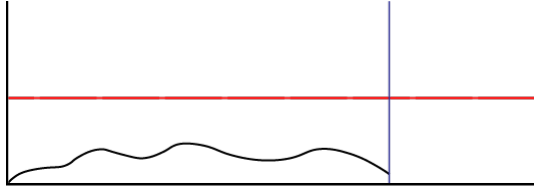


When the traceline does not lift above the bottom of the graph, this indicates that there is a large leak between the QuantiFit2 and the person wearing the respirator. This would be related to a leak in the integrity of the respirator, a poor donning, or poor fit of the respirator.

1. Check all connections for secure attachment.
2. Check to ensure that the QuantiFit2 respirator adapter is properly attached to the respirator. Look for cross-threading, loose connection, etc.
3. Check respirator for proper tightness to the face and check that no hair, beard stubble, unique face characteristics, or other objects inhibit a good face-to-facepiece seal.

4. Try a different respirator. Many respirators *seem* to fit well but are not properly sized to a specific wearer. In other cases, a different size or style may be better suited for the individual wearer.

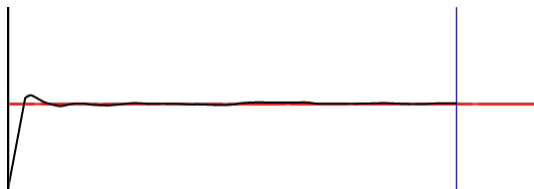
Failure to reach challenge pressure



Like the large leak, when the traceline does not reach the challenge pressure line, this indicates that there is a moderate leak between the QuantiFit2 and the person wearing the respirator.

1. Check all connections for proper attachment.
2. Check to ensure that the QuantiFit2 respirator adapter is properly attached to the respirator. Look for cross-threading, loose connection, etc.
3. Check respirator for proper tightness to the face and check that no hair, beard stubble, unique face characteristics, or other objects inhibit a good face-to-facepiece seal.
4. Try a different respirator. Many respirators *seem* to fit well but are not properly sized to a specific wearer. In other cases, a different size or style may be better suited for the individual wearer.

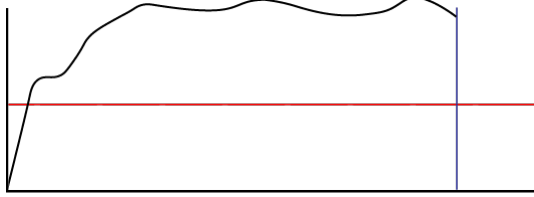
Perfect graph but still fails



When the graph looks like a perfect fit test, but the fit factor is too low to pass, this means that there is a leak, but it's not a huge leak. This would be related to a leak in the integrity of the respirator, a poor donning, or in the fit of the respirator. Make adjustments necessary, and if the test subject cannot pass, they would need to try a different size or even different brand.

1. As in other leakage situations (see HIGH LEAKAGE), check all tube connections, adapters, and adapter connections to respirators.
2. Check for proper tension of respirator to face.
3. Try a different size or different respirator.
4. Have fit test adapter checked for leaks (call OHD for this service).

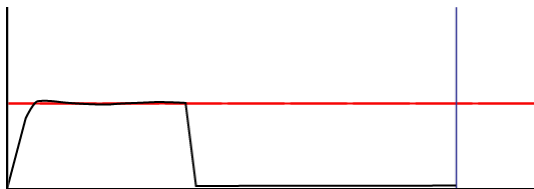
Traceline way above challenge pressure line



The QuantiFit2 traceline goes opposite of the direction of the pressure. If the line is above the challenge pressure line, that means that there is too much negative pressure. In this case, a test subject is most likely sucking in a breath during the test. If the line is below the challenge pressure, that means that the QuantiFit2 couldn't create enough negative pressure because the leak is so great.

1. Movement by the person being tested needs to be minimized. Actions such as swallowing, opening the mouth, and moving the tongue can adversely affect the pressure sensor and will be indicated by an erratic traceline.
2. Air inhalation or exhalation, even slightly, creates dramatic changes within the respirator. Re-instruct the test subject to maintain breath holding during the test measurement.
3. A test subject may be unable to stop the flow of air through the nose while holding his or her breath. A nose clip can assist the subject (be sure that the nose clip does not interfere with the fit of the respirator).
4. Improper breath hold. Instruct the user to relax, take a comfortable breath and hold as if going under water.

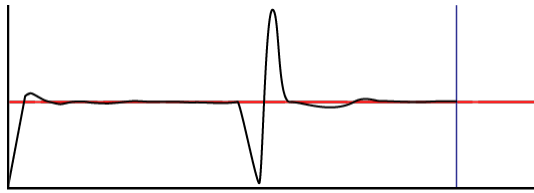
The in-respirator pressure drops during the test



This graph would indicate that the challenge pressure was achieved, but during the test, a leak source opened. This could be the result of a exhalation valve that is in poor condition, or from the test subject moving his or her head and creating a leak in the seal.

1. Clean the exhalation valve
2. Replace exhalation valve
3. Examine the condition of the respirator

Large up-and-down spike during the test



When the traceline goes way down and then way up, this would indicate that the test subject swallowed during the test.

1. Instruct the test subject to remain calm and not to swallow or move during the test measurement.
2. Remove distractions from the area that may be interfering with the test (e.g. other test subjects making the test subject to be nervous or to laugh during a test).

Failing Fit Factors

Low Fit Factors

When fit factors are consistently low, the respirator may be a poor fit for that person. If the graph looks normal and the fit factor is low, that means that the QuantiFit2 is successful in meeting the challenge pressure, but a large volume of air is required to be removed to achieve that targeted pressure, which means the leak is too large.

When the leak rate is large, the graph can still look somewhat normal. The QuantiFit2 will often be able to keep up with the leak and give a good test result, regardless of the fact that the leak is too large to yield a passing fit factor.

1. As in other leakage situations (see HIGH LEAKAGE), check all tube connections, adapters, and adapter connections to respirators.
2. Check for proper tension of respirator to face.
3. Be sure that the mask is centered on the head, and that that straps are pulled equally on both sides.
4. Try a different size or different respirator.
5. Have adapter checked for leaks (call OHD for this service).

Fit Factor of 0

When the fit factor equals 0, this indicates that the QuantiFit2 was not able to sustain the challenge pressure long enough, or that the traceline movement was so great that the QuantiFit2 did not receive accurate data to calculate a leak rate or fit factor.

1. Movement by the person being tested needs to be minimized. Actions such as swallowing, opening the mouth, and moving the tongue can adversely affect the pressure sensor.

2. Air inhalation or exhalation, even slightly, creates dramatic changes within the respirator. Re-instruct the test subject to maintain breath holding during the test measurement.
3. A test subject may be unable to stop the flow of air through the nose while holding his breath. A nose clip can assist the subject (be sure that the nose clip does not interfere with the fit if the respirator).
4. Improper breath hold. Instruct the user to relax, take a comfortable breath and hold as if going under water.

Trouble Passing Fit Test

What do I do when people are not passing a fit test?

This problem could include a number of variables, but most likely would fall into three categories: instrument failure, respirator fit, or adapter fault. If it's a one-time problem when other people can pass, the answer simply may be that the respirator is not a good fit on the subject. When several subjects can't pass, look at the other variables:

1. Instrument Failure

- a. You must do the Daily Verification Check at the beginning of each day.
- b. If the QuantiFit2 finishes passes the daily verification procedure, this assures that the instrument is operating properly and measuring within tolerance.
- c. If the QuantiFit2 is not able to complete the Daily Verification Check, service will be needed. Please contact OHD customer service.

2. Respirator/Fit Fault

- a. The Operator must first determine that there is a proper fit. Any facial hair, hair getting anywhere under the respirator seal, temple hair too far forward, sunken temples or facial scarring, protrusions or blemishes, having the respirator too loose or too tight, all can be reason enough to keep the QuantiFit2 from pulling a negative pressure within the respirator. There are other obstacles that can come into play which are too numerous to list. With more experience fit testing, it's easier for one to see potential problems with fit.
- b. To further check on the respirator fit, do a user seal check for 10 seconds. Press the Seal Check button located on the test screen, and take and take in a breath and hold the pressure allowing for plenty of suction on the respirator. If after 10 seconds the respirator "drops" when releasing the Seal Check button, this indicates a good fit. If after the same procedure there is no drop or "falling away" from the face, this indicates that all of the air leaked out through a leak source and is the reason for a failed test step.
- c. Exhalation valves may be dirty or creased allowing air to be pulled into the respirator. While the inhalation valves must be removed or propped open, the exhalation valve must remain in place and maintain a good seal. Clean the side of the valve that faces

the interior of the respirator. This can be done with water, and will remove any small obstruction that is keeping the inhalation valve from closing in an air-tight manner.

- d. On the respirator, the apex of the head straps should sit on the crown of the head and not off to one side or the other.
- e. Check the manufacturer's recommendation for properly donning a respirator and ensure that the user has been properly trained in donning that respirator as part of the regulations. All straps must be pulled with equal tension at each point.

3. Adapter Fault

- a. The adapters must be kept clean and in good shape.
- b. Disconnect and reconnect all tubes to make sure the connectors "snap" into place. Hold the assembly by the tubes rather than the metal connector.
- c. If the adapter had been dropped or crushed, a hairline crack might cause leakage.
- d. To verify the adapter is air-tight, connect only the blue tube to the adapter with the single tube connection. Submerge the adapter and tube connection completely under water. Then press and hold the SEAL CHECK button for at least 5 seconds. Repeat this several times. If bubbles are seen coming from the adapter, there is a leak in the diaphragm or in the eight screws holding the top plate on. Replace the diaphragm and tighten screws firmly. Conduct the test again to ensure no bubbles are seen.
- e. Check all screws and connectors. If the screws on the top of the adapter are not tight, or if the connector ports can be turned by hand, this means they are not tight enough and may be introducing a leak into the system.

Verification Check Errors

The Daily Verification Check normally functions to completion without any intervention from the Operator. However, occasional problems may arise. The calibration procedure may stop abruptly or display an error message.


Possible Problem:

- Something has blocked or partially obstructed the leak orifice on the Dual Tube Assembly and has rendered the tube out of tolerance.
- Pressure in the transducer has not been zeroed.
- The transducer needs factory calibration.
- Blockage of exhaust port.

Possible Solution:

- Turn QuantiFit2 off at the power switch, wait 15 seconds, power on the Quantifit, and retry Verification Check.

- Remove and replace all tubes.
 - Contact OHD to evaluate problem or to arrange return for factory calibration.
-

- Should service be needed for your instrument, contact the OHD Service Department. For those instruments outside the U.S. contact OHD to find the nearest service center.
- CAUTION: The QuantiFit2 is intended to be serviced only by authorized service personnel. Troubleshooting and service procedures should only be performed by qualified technicians. 
- If the QuantiFit2 appears to be tampered with, this may render the warranty null and void.
- For service and operation questions, contact OHD: service@ohdglobal.com, +1.205.980.0180.

Calibration and Maintenance

To ensure that the QuantiFit2 is working properly and within specification, a daily verification must be performed before each day of testing, and an annual factory calibration must be done once each year.

- **Calibration & Maintenance**

- The QuantiFit2 is an OSHA accepted Quantitative (QNFT) fit test instrument. It utilizes the Controlled Negative Pressure (CNP) fit test method as outlined in the Respiratory Protection Standard - 29 CFR 1910.134, Appendix A.
- The QuantiFit2 is a highly accurate precision instrument that uses electronic pressure sensors to detect minute changes to very low levels of negative pressure to an accuracy of +/- 0.25%. To ensure the instrument operates at the parameters for which it is designed, OHD requires the QuantiFit2 to receive annual maintenance and calibration at an authorized service facility.

- **Reasons for Annual Maintenance & Calibration:**

- OSHA Mandate – 29 CFR 1910.134 Appendix A Part I.C.1.(b) – “The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer’s instructions so as to operate at the parameters for which it was designed.”
- Best Practice – Annual calibration and maintenance is the accepted industry standard for Industrial Hygiene and Occupational Health instrumentation.
- Reliable Results – The QuantiFit2 is a precision instrument that is used to help ensure employee safety. Critical decisions are made based on the results provided by the QuantiFit2. All precision instruments require some degree of calibration to ensure the measurements are accurate.
- Limits Liability – Complying with the manufacturer’s guidelines establishes good faith efforts towards employees’ health and safety. Failure to comply with established safety protocols could be viewed as negligent.

- Extends Service Life – The heart of the QuantiFit2 is a mechanical piston type pressure engine. Included in the calibration procedure are pressure engine checks. The pressure engine is completely disassembled, cleaned, and lubricated where warranted.
- Upgrades – The calibration process includes upgrades to the latest firmware versions and modifications as needed.
- Confidence – Our NIST (National Institute of Standards and Technology) traceable calibration assures that the unit is operating properly within accepted parameters.

Standard Terms and Conditions

Claims

Our routine method of shipment is via common carrier, FOB origin. Upon delivery, if physical damage is found, retain all packing materials in their original condition and contact the carrier immediately to file a claim.

If the instrument is delivered in good physical condition but does not operate within specifications, or if there are any other problems not caused by shipping damage, please contact OHD or your local sales representative.

Standard Terms and Conditions

Refunds & Credits Please note that only serialized products (products labeled with a distinct serial number) and accessories are eligible for partial refund and/or credit. Non-serialized parts and accessory items (cables, carrying cases, auxiliary modules, etc.) are not eligible for return or refund. In order to receive a partial refund/credit of a product purchase price on a serialized product, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, cables, accessories, etc.) within 90 days of original purchase and in "as new" and resellable condition. The Return Procedure must be followed to assure prompt refund/credit.

Restocking Charges Only products returned within 90 days from the date of original purchase are eligible for refund/credit. Products returned within 30 days of original purchase are subject to a minimum restocking fee of 15%. Products returned in excess of 30 days after purchase, but prior to 90 days, are subject to a minimum restocking fee of 20%. Additional charges for damage and/or missing parts and accessories will be applied to all returns. Products not returned within 90 days of purchase, or products which are not in "as new" and resellable condition, are not eligible for credit return and will be returned to the customer.

Return Procedure Every product returned for refund/credit must be accompanied by a Return Material Authorization (RMA) number, to be obtained from our Order Processing Department. All items being returned must be sent freight prepaid to our factory location.

Certification This instrument was thoroughly tested and inspected and found to meet OHD manufacturing specifications when it was shipped from the factory. Calibration measurements are traceable to the National Institute of Standards and Technology (NIST). Devices for which there are no NIST calibration standards are measured against in-house performance standards using accepted test procedures.

Warranty and Product Support

The Quantifit is warranted by OHD against defects in materials and workmanship for two full years from the date of original purchase. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to OHD. This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than OHD. IN NO EVENT SHALL OHD BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Only serialized products and their accessory items (those items bearing a distinct serial number tag) are covered under this two-year warranty. PHYSICAL DAMAGE CAUSED BY MISUSE OR PHYSICAL ABUSE IS NOT COVERED UNDER THE WARRANTY. Items such as cables and non-serialized modules are not covered under this warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, province to province, or country to country. This warranty is limited to repairing the instrument to OHD specifications. When an instrument is

returned to OHD, for service, repair, or calibration, we recommend using United Parcel Service, Federal Express, or Air Parcel Post. We also recommend that you insure your shipment for its actual replacement cost. OHD will not be responsible for lost shipments or instruments that are received in damaged condition due to improper packaging or handling. All warranty claim shipments must be made on a freight prepaid basis. Also, in order to expedite your claim, please include a properly completed copy of the Service Return Form. Recalibration of instruments, which have a recommended annual calibration frequency, is not covered under the warranty.

Use the original carton and packaging material for shipment. If they are not available, we recommend the following guide for repackaging:

- Use a double-walled carton of sufficient strength for the weight being shipped.
- Use heavy paper or cardboard to protect all instrument surfaces. Use nonabrasive material around all projecting parts.
- Use at least four inches of tightly packed, industrial-approved shock-absorbent material around the instrument.

Warranty Disclaimer Should you elect to have your instrument serviced and/or calibrated by someone other than OHD, please be advised that the original warranty covering your product becomes void when the tamper-resistant Quality Seal is removed or broken without proper factory authorization. We strongly recommend, therefore, that you send your instrument to OHD for factory service and calibration, especially during the original warranty period. In all cases, breaking the tamper-resistant Quality Seal should be avoided, as this seal is the key to your original instrument warranty. In the event that the seal must be broken to gain internal access to the instrument (e.g., in the case of a customer-installed firmware upgrade), (continued)

you must first contact OHD technical support department at +1 205-980-0180. You will be required to provide us with the serial number for your instrument as well as a valid reason for breaking the Quality Seal. You should break this seal only after you have received factory authorization. Do not break the Quality Seal before you have contacted us! Following these steps will help ensure that you will retain the original warranty on your instrument without interruption.

WARNING Unauthorized user modifications or application beyond the published specifications may result in electrical shock hazards or improper operation. OHD will not be responsible for any injuries sustained due to unauthorized equipment modifications.

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Unpacking and Inspection Follow standard receiving practices upon receipt of the instrument. Check the shipping carton for damage. If damage is found, stop unpacking the instrument. Notify the carrier and ask for an agent to be present while the instrument is unpacked. There are no special unpacking instructions, but be careful not to damage the instrument when unpacking it. Inspect the instrument for physical damage such as bent or broken parts, dents, or scratches.

All written requests must be submitted to the contact information as follows:

OHD, LLLP
2687 John Hawkins Parkway
Hoover, Alabama 35244
+1 205-980-0180
+1 205-980-5764 FAX
sales@ohdglobal.com
www.ohdglobal.com

Software License Agreement

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General

| | |
|-----------------------------|---------------------------------------|
| Input Voltage | 12VDC, Center Positive, 3A Max |
| Power Supply | Universal, 100-240VAC, 50/60Hz 1A Max |
| Operating Temperature | 15 to 30C |
| Humidity Range | 20 to 80%, Non-Condensing |
| Setup Memory | 20 GB |
| Size | (H) 11 x (W) 4.4 x (D) 15 inches |
| Weight | 8.5 lbs |

Dynamic Range

| | |
|------------------------------|---------------|
| Leak Test Measurement | 2-5000 cc/min |
| Resolution | 0.1 cc/min |
| Fit Factor Computation | 6-53,000 |
| Resolution | 1 |

Pressure Sensor - Fit Testing

| | |
|--------------------------------|--------------------------|
| Pressure Range | 0-20 in H ₂ O |
| Resolution | 0.01 in H ₂ O |
| Accuracy | ± 0.25% FS |
| Over Pressure Limit | 60 in H ₂ O |
| Temperature Compensation | 5-45C |

Pressure Sensor – Pump

| | |
|--------------------------------|-----------|
| Pressure Range | 0-20 PSI |
| Resolution | 0.1 PSI |
| Accuracy | ± 2.5% FS |
| Over Pressure Limit | 60 PSI |
| Temperature Compensation | 5-45C |

Instrument Accuracy

| | |
|-----------------------------|------------------------------------------|
| Challenge Pressure | ± 5% |
| Leak Rate Measurement | ± 3% or ±3 cc/min (whichever is greater) |
| Display | 800 x 480 pixels |
| Touchscreen | Capacitive Touch |

Environmental

| | |
|------------------------|-------------------|
| Pollution Degree | 2 |
| Altitude | 2,000 M/6,500 ft. |

USB Interface

| | |
|------------------------------------------------------|---|
| 4 Type A Ports (Keyboard, USB Memory, Printer) | 4 |
| 1 Type B Port (PC Communication) | 1 |

PC Requirements for OHD Logic Software

| | |
|------------------------|---------------------|
| Operating System | Windows 10 or newer |
| Processor Speed | 1.0 GHz or greater |
| RAM | 1 GB or greater |
| Disc Space | 16 GB |

Certifications

- UL61010-1/CSA C22.2
- EN 61326-1:2013
- FCC Part 15 Subpart B
- Industry Canada ICES-003 Issue 6

To import a list of names directly into the QuantiFit2, an Excel spreadsheet must be filled out with specific headers (see below).

Fields can be empty and will be empty on the unit.

When importing data from the OHD Logic Software, the data will be formatted perfectly for import.

| | A | B | C | D | E | F | G |
|----|-----------|----------|-------------|-------|-------|-------|---------|
| 1 | FirstName | LastName | PersonnelID | Group | Note1 | Note2 | Company |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

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

Assigned protection factor (APF) a numerical indicator of the level of protection a respirator can be expected to provide when it is worn correctly and functioning properly. It represents the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program.

Example: An APF of 10 means that no more than one-tenth of the contaminants to which the worker is exposed will leak into the inside of the respirator and it can be safely used in an atmosphere that has a hazardous concentration of up to 10 times the Permissible Exposure Limit (PEL) or other exposure limit for that hazard.

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

Canister or cartridge a container with a filter, sorbent, catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Condensation Nuclei Counting (CNC) method of Quantitative fit testing (QNFT) also known as ambient aerosol which measures aerosol concentration inside the breathing zone of a respirator with the use of a probe and outside of the respirator. The aerosols measured inside the respirator are assumed to be the result of leakage.

Controlled Negative Pressure (CNP) method of Quantitative fit testing (QNFT) that pulls and maintains a negative pressure inside a respirator by removing, and directly measuring, any air that leaks into the facepiece.

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

Filter or air purifying element a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust respirator) a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor a numerical representation of the fit of a respirator to a specific individual; typically estimating the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Example: Controlled Negative Pressure converts the leak rate it has measured into a fit factor. To do this it takes the modeled breathing rate and divides it by the measured leak rate. This is how you get each individual exercise's fit factor. Another way to look at this is that it is the ratio of the total air inhaled to the possibly contaminated air inhaled.

Fit test the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

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

High efficiency particulate air (HEPA) filter a filter that is at least 99.97% efficient in removing monodisperse particles 0.3 micrometers (μm) in diameter. The filtration efficiency increases for particle diameters both less than and greater than 0.3 μm . The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Loose-fitting facepiece a respiratory inlet covering that is designed to form a partial seal with the face.

Maximum use concentration (MUC) the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC based on relevant available information and informed professional judgment.

Negative pressure respirator (tight fitting) a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen deficient atmosphere an atmosphere with an oxygen content below 19.5% by volume.

Permissible Exposure Limit (PEL) is a regulatory limit on the amount or concentration of a substance in the air.

Positive pressure respirator a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

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

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

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

Quantitative fit test (QNFT) an assessment of the adequacy of respirator fit by numerically calculating the amount of leakage into the respirator.

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

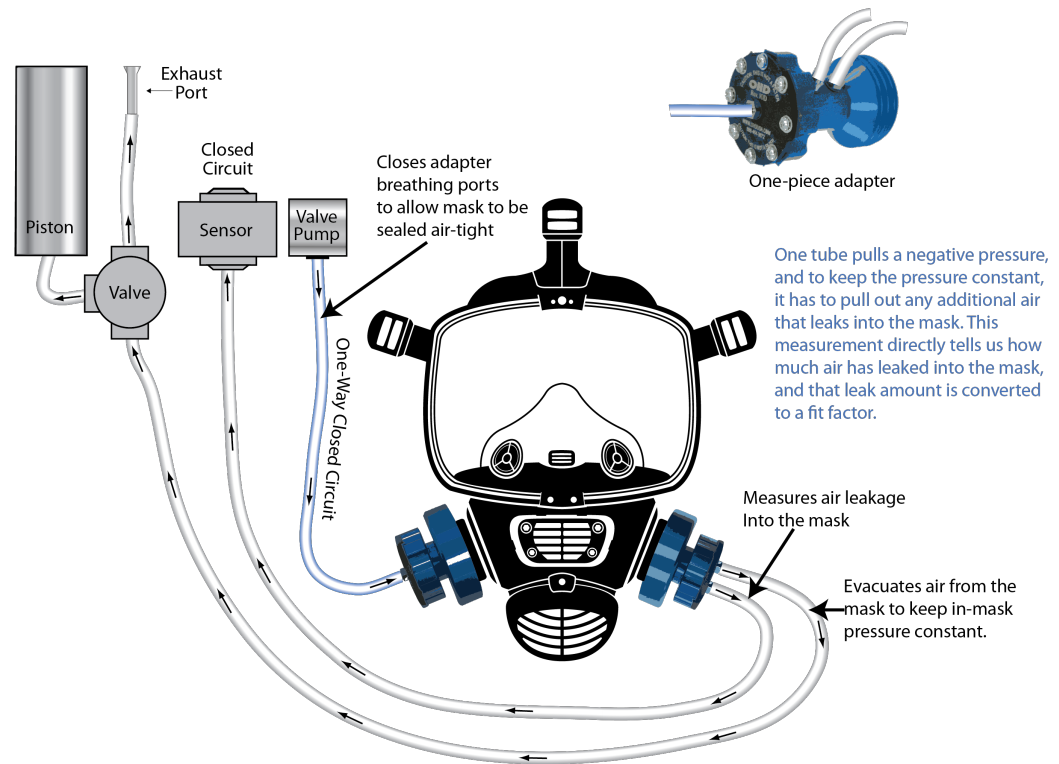
Self-contained breathing apparatus (SCBA) an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life the time that a respirator, filter, sorbent, or other respiratory equipment provides adequate protection to the wearer.

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

Tight-fitting facepiece a respiratory inlet covering that forms a complete seal with the face.

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



OSHA (Occupational Safety and Health Administration)



- 5-Step Protocol
 - i. Face Forward
 - ii. Bend Over
 - iii. Shake Head
 - iv. Redon 1
 - v. Redon 2
- Challenge Pressure/Modeled Breathing Rate
 - i. Half Face: 0.58/53.8
 - ii. Full Face: 0.58/53.8
 - iii. MIL: 1.0/55.8
 - iv. SCBA: 1.5/93.1
- Minimum Passing Fit Factors
 - v. Half Face: 100
 - vi. Full Face: 500
 - vii. MIL: 500
 - viii. SCBA: 500

CSA (Canadian Standards Association)



- 5-Step Protocol
 - vi. Face Forward
 - vii. Bend Over
 - viii. Shake Head
 - ix. Redon 1
 - x. Redon 2
- Challenge Pressure/Modeled Breathing Rate
 - Half Face: 0.58/53.8
 - Full Face: 0.58/53.8
 - SCBA: 1.5/93.1
- Minimum Passing Fit Factors
 - Half Face: 100
 - Full Face: 500
 - SCBA: 2000

UK-HSE (Health and Safety)



- 16-Step Protocol
 - i. Normal Breathing Exercise
 - ii. Face Forward Test
 - iii. Deep Breathing Exercise
 - iv. Face Forward Test
 - v. Head Side to Side Exercise
 - vi. Head Left Test
 - vii. Head Right Test
 - viii. Head Up and Down

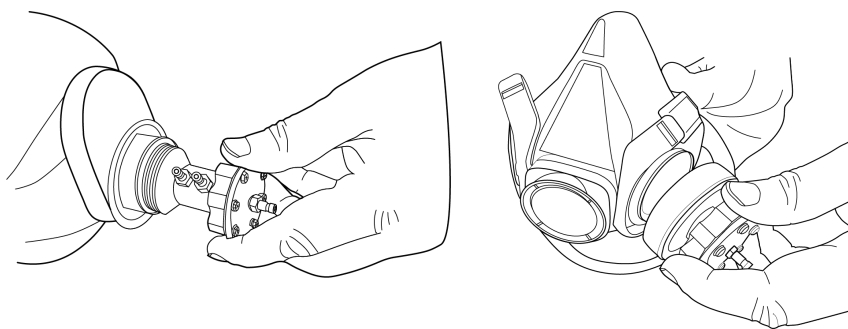
- ix. Head Up Test
- x. Head Down Test
- xi. Talking Exercise
- xii. Face Forward Test
- xiii. Bend at Waist Exercise
- xiv. Face Forward Test
- xv. Normal Breathing Exercise
- xvi. Face Forward Test
- Challenge Pressure/Modeled Breathing Rate
 - Half Face: 0.58/53.8
 - Full Face: 0.58/53.8
 - SCBA: 1.5/93.1
- Minimum Passing Fit Factors
 - Half Face: 100
 - Full Face: 500
 - SCBA: 2000

ISO (International Standards Association)

- 5-Step Protocol
 - i. Face Forward
 - ii. Bend Over
 - iii. Shake Head
 - iv. Redon 1
 - v. Redon 2
- Challenge Pressure/Modeled Breathing Rate
 - Half Face: 0.58/53.8
 - Full Face: 0.58/53.8
 - SCBA: 1.5/93.1
- Minimum Passing Fit Factors
 - Half Face: 100
 - Full Face: 500
 - SCBA: 500



Fit test adapters are required to create an interface between the QuantiFit2 and the respirator. These adapters are inserted where the filters, cartridges, or regulators mount to the respirator.



Each respirator manufacturer has its own unique cartridges, filters, or regulators to attach to their models. OHD matches the connections which will allow an interface.

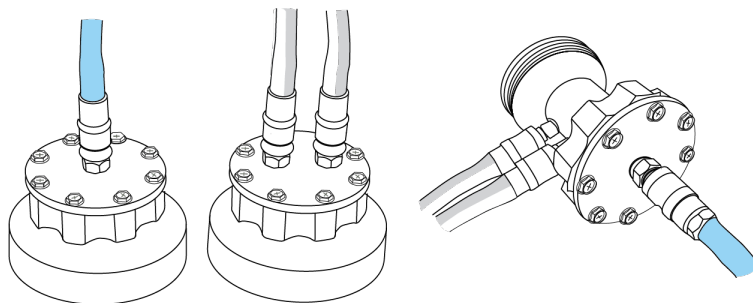
In the case of an SCBA, the respirator might be required to be converted to an air-purifying respirator.

OSHA 1910.134(f)(8)(i)

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

OHD testing adapters must be maintained with great care. Any dents or cracks that can occur will lose the ability to keep an air-tight seal, which would make it inadequate for testing.

Adapters can come in a one-piece or two-piece arrangement called "kits." The two-piece kit is for the bayonet connection, or connections on either side of the respirator. These are used mostly for air purifying respirators. The one-piece adapters take the place of a gas filter or SCBA connection and are typically used on those types of respirators.



When attaching the hose assembly for testing, the blue hose always connects to the single port, and the gray and transparent hoses connect to the two ports side-by-side. For the gray and transparent tubes, it does not matter which connector gets which hose as long as the blue connects to the single port.

Adapters can be cleaned or disinfected in various ways. A disinfectant spray can be used, or the adapter may be submerged in a disinfectant liquid solution. The adapter should be dried before the next use.

To view the most updated [adapter list](#), you can go to the OHD website, OHDGLOBAL.COM.

To troubleshoot the fit test adapters:

- a. The adapters must be kept clean and in good shape.
- b. Disconnect and reconnect all tubes to make sure the connectors “snap” into place. Hold the assembly by the tubes rather than the metal connector.
- c. If the adapter had been dropped or crushed, a hairline crack might cause leakage.
- d. To verify the adapter is air-tight, connect only the blue tube to the adapter with the single hose connection. Submerge the adapter and hose connection completely under water. Then press and hold the SEAL CHECK button for at least 5 seconds. Repeat this several times. If bubbles are seen coming from the adapter, there is a leak in the diaphragm or in the eight screws holding the top plate on. Replace the diaphragm and tighten screws firmly. Conduct the test again to ensure no bubbles are seen.
- e. Check all screws and connectors. If the screws on the top of the adapter are not tight, or if the connector ports can be turned by hand, this means they are not tight enough and may be introducing a leak into the system.

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