

The OHIP logo is located in the top right corner of the image. It consists of the letters 'OHIP' in a bold, sans-serif font, with a stylized circular element to the left of the 'O'.

OHIP

The background of the slide is a dark, semi-transparent image of a Quantifit 2 device. The device is a rectangular, light-colored unit with a large screen at the top displaying several icons. Below the screen are several ports and buttons. The text 'Quantifit 2' is faintly visible on the left side of the device.

ADVANCEMENTS IN RESPIRATOR FIT TESTING WITH CNP

STEPHANIE LYNCH, PHD

WHAT IS A FIT TEST?

The use of a protocol to evaluate the fit of a respirator on an individual



Verifies training and identifies the specific make, model, style, and size of respirator best suited for each employee

QUALITATIVE FIT TESTING (QLFT)

Subjective, Pass/Fail test that relies on the employee's response to an agent to detect leakage

- Current typical methods:
 - Isoamyl Acetate
 - Saccharin
 - Bitrex

If the presence of the test agent is detected inside the mask, the respirator fit is considered to be inadequate

Only be used to fit test negative pressure air-purifying respirators that require a fit factor of 100 or less (typically half mask)

QLFT

- Inexpensive
- Low maintenance
- Imprecise
- Subjective
- Subject to cheating
- Slow



QUANTITATIVE FIT TESTING (QNFT)

Objective; Uses a machine to measure leakage into the mask

Provides a numerical value of the fit called a fit factor

- Three methods accepted by OSHA:
 - Controlled Negative Pressure
 - Ambient Aerosol Condensation Nuclei Counter (CNC)
 - Generated aerosol

Can be used on any tight-fitting respirator

TWO MOST COMMON METHODS OF QNFT

CNP

- OHD Quantifit & QuantiFit2
- Air is the challenge agent
- Uses a Controlled Negative Pressure to directly measure respirator leakage
- Precisely measures leak rate (in cc/min) by determining the amount of air that leaks into the respirator during the fit test

Ambient Aerosol CNC

- TSI PortaCount or Accutec AccuFIT 9000
- Aerosols are the challenge agent
- Carried out by probing the facepiece and calculating the ratio of external particles to the particles in the mask
- Aerosol can be artificially created for testing if natural particle counts are too low

QNFT

- More expensive
- Require maintenance
- Precise
- Objective
- Documentation
- Faster



WHY FIT TEST?

- Protect the health of employees
- Ensure employees are trained on their mask and their risk
- Provide employees peace of mind
- Required by:
 - OSHA 29 CFR 1910.134
 - ANSI Z88.10 – 2010
 - ISO 16975 – 2017



WHEN TO FIT TEST?

- As part of the initial respirator selection
- Where an untested facepiece is already in use

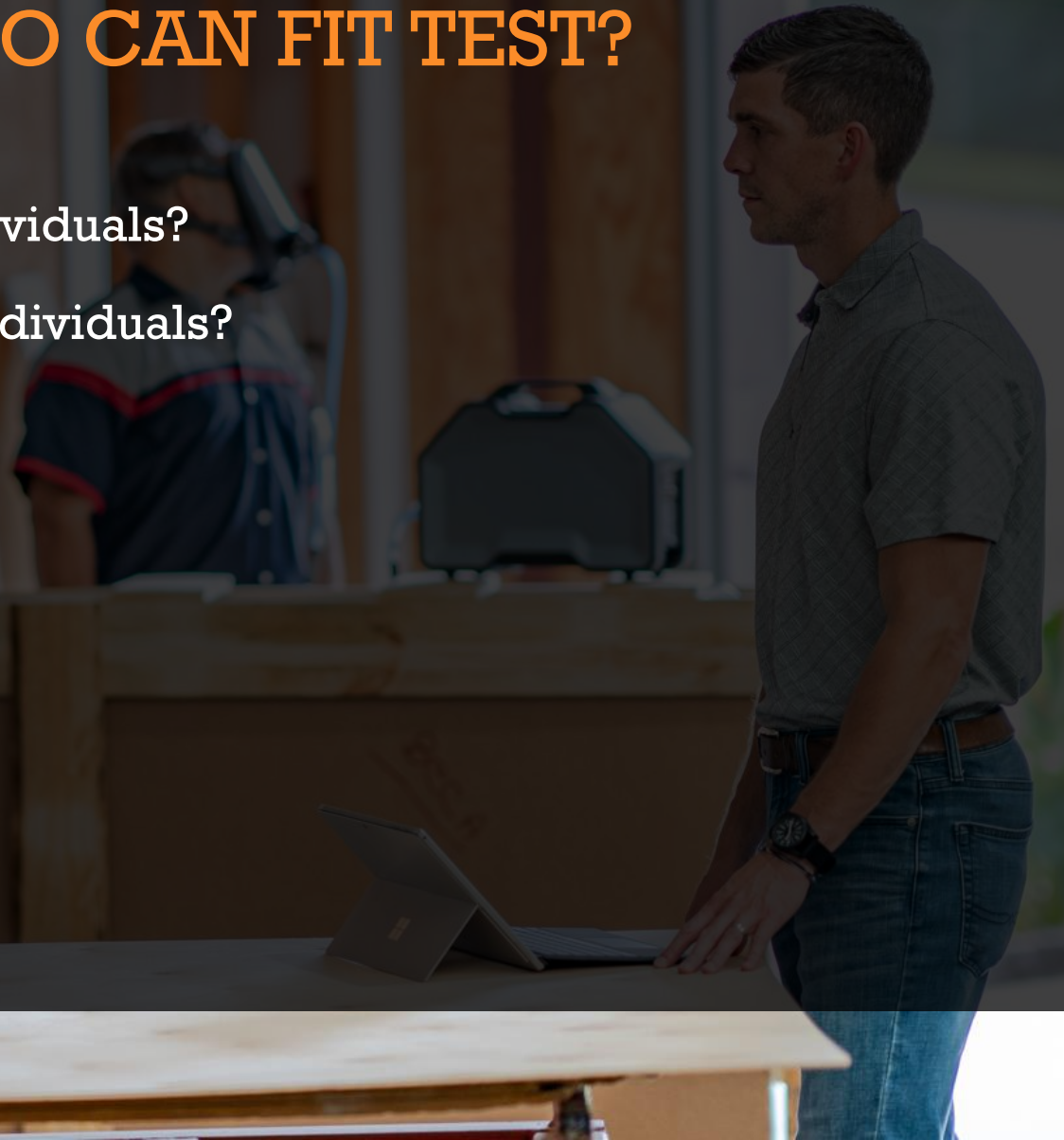


HOW ABOUT A REPEAT TEST?

- When the wearer:
 - Loses or gains significant weight (+/- 20lbs or 9kg)
 - Undergoes any substantial dental work
 - Develops any facial changes (scars, moles, etc.) around the faceseal area
- At the regulated time interval

WHO CAN FIT TEST?

- “Qualified” individuals?
- “Competent” individuals?
- Anyone?



RESP-FIT

Officially launched December of 2020

Identified metrics for qualifying individuals to perform fit testing

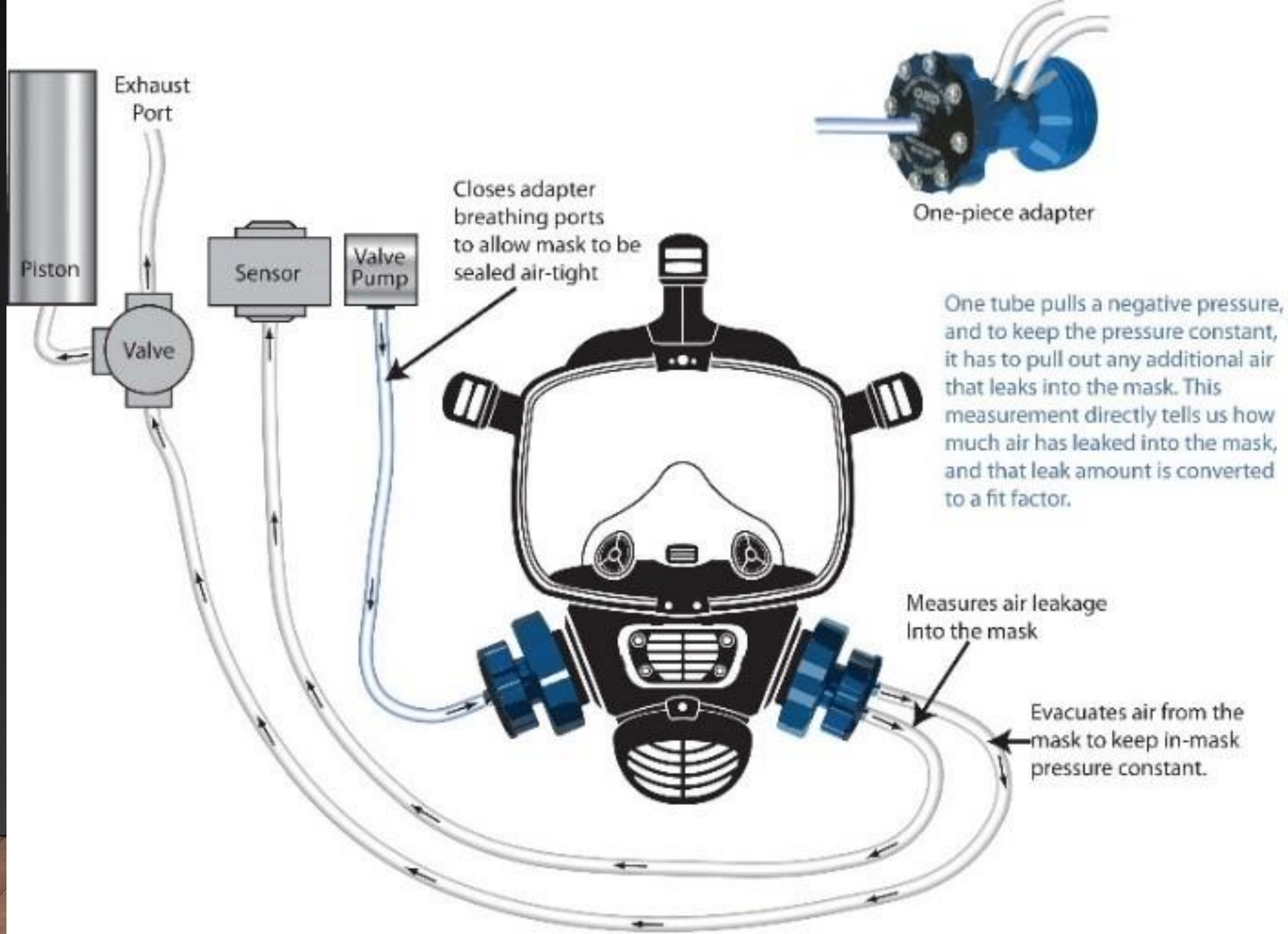
Resource for Fit Test training

Offers Fit Testing accreditation



CONTROLLED NEGATIVE PRESSURE

- The OHD QuantiFit2 instrument.
- Uses a Controlled Negative Pressure to directly measure respirator leakage.
- CNP precisely measures leak rate by determining the amount of air that leaks into the respirator during the fit test.
- Air is the challenge agent.



$$\text{CNP FIT FACTOR} = \text{BR} / \text{LR}$$

Where:

BR = inspiratory flow rate associated with CNP challenge pressure (modeled breathing rate);

LR = mean leakage flow rate (leak rate) measured with the head held still at the end of each test exercise

$$\text{OVERALL FIT FACTOR} = \frac{N}{\left[\frac{1}{\text{FF1}} + \frac{1}{\text{FF2}} + \dots + \frac{1}{\text{FFN}} \right]}$$

Where:

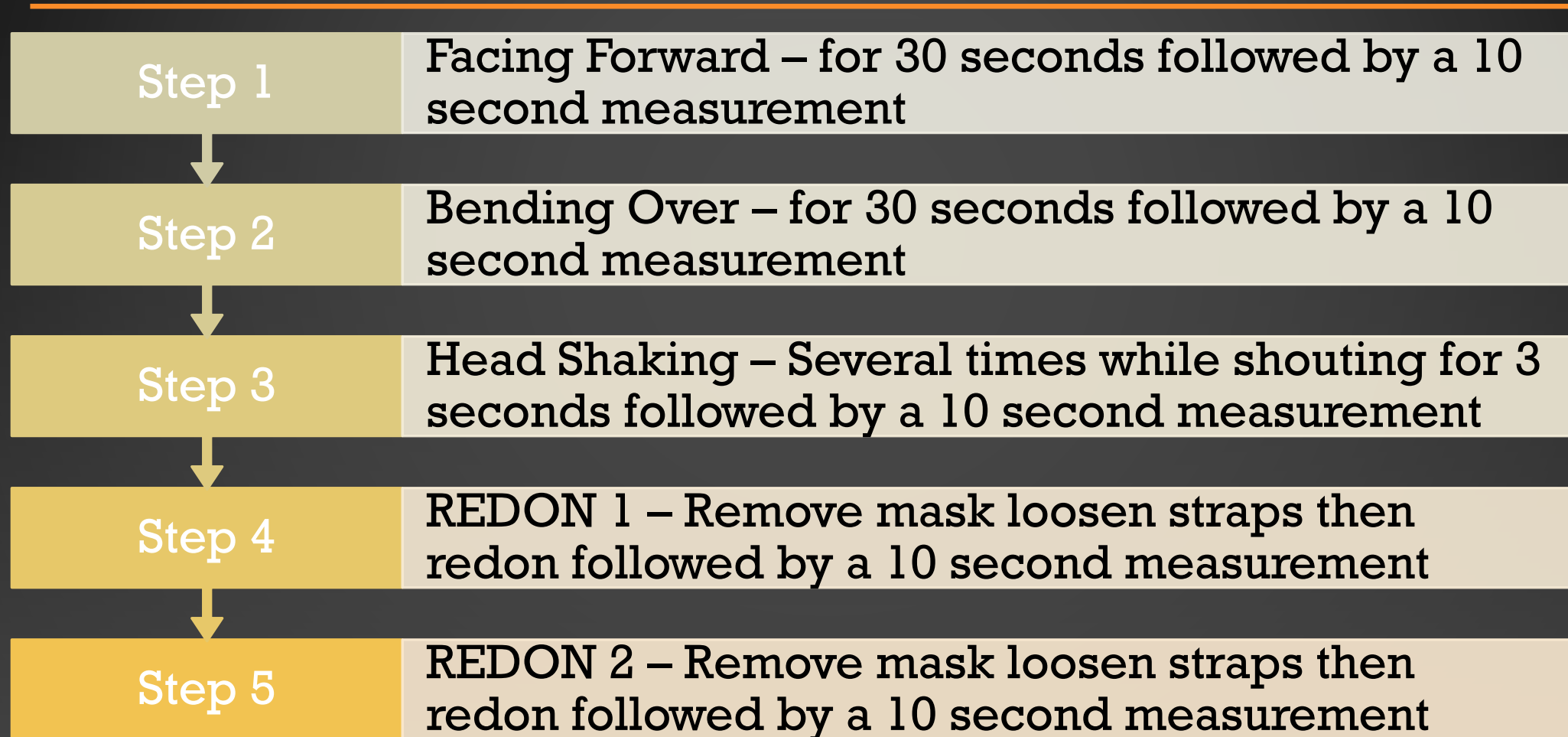
N = The number of exercises;

FF1 = The fit factor for the first exercise;

FF2 = The fit factor of the second exercise;

FFN = The fit factor of the Nth Exercise.

REDON PROTOCOL





QUANTIFIT2 EXPERIENCE

- Battery Power
- Bluetooth Capability
- Color Touch Screen Display
- AutoStart
- On Screen Signature Capture
- OHD Logic
- Perform Multiple Tests Simultaneously



QUANTIFIT2 BATTERY



RECHARGEABLE (QUANTIFIT2
OR CHARGING CABLE)



FOUR PLUS HOUR RUN TIME



UNLOCKING ALL RESPIRATOR
FIT TESTING ENVIRONMENTAL
RESTRICTIONS



LED TOUCHSCREEN

+

ANIMATION GUIDANCE





OHD LOGIC SOFTWARE

The screenshot displays the OHD Logic software interface with the following components:

- Header:** "Home" with the OHD logo.
- Test Creator: OSHA:**
 - Operator: First Name (John), Last Name (Smith), Remember (checked).
 - Company: Default Company, Subject (+).
 - Respirator: Medium, Size (Medium).
 - Quantifit2: (dropdown menu).
- Add person to Default Company:**
 - Standard Fields: Personnel ID, First Name, Last Name, Middle Initial, Last Fit, Notes.
 - PPE: Inactive.
 - Buttons: Save, Cancel.
- Past Due Viewer:** Hide Never Tested, Past Due Tests. No Tests Due.
- 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 Quantifit2's. No Registered Units.

OHD
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Test Fit Report
Tuesday, February 23, 2021, 02:21:30 PM

TERESA LARSON
OHD

Respirator:	Scott AV2000	Protocol:	OSHA - SCBA
Size & Type:	Medium Full	Challenge Pressure:	1.5
Serial Number:	86111012	Last Daily Verification:	02/17/21
Minimum Fit Factor:	500	Last NIST Calibration:	11/13/20

Step	Fit Factor	Leak Rate
1 Face forward	8387	11.1
2 Bend over	1577	59
3 Shake head	2096	44.4
4 Re-don 1	2644	35.2
5 Re-don 2	2221	41.9
Overall	2428	38.3

Pass

Teresa Larson

TERESA LARSON

T Larson

T LARS

OHD
OHD Quantifit 2 Respirator Fit Test
TERESA LARSON
Scott AV2000 Medium Full
Tested by: T LARS
Using OSHA - SCBA protocol
Overall Fit Factor: 2428 Pass
Good Through: 02/23/22

- Home
- People
- Company
- Tests
- Settings
- Reports

Test Creator: OSHA 1 running test

Operator

First Name

Last Name Remember

Company

Subject +

Respirator +

Size

Booth Armstrong SCBA Step Running Booth Q2 🗑️

Mask Name: MSA G1
 CP: 1.5
 Passing FF: 500

Step	FF	Status
Face forward	0	Running
Bend over	0	Waiting
Shake head	0	Waiting
Re-don 1	0	Waiting
Re-don 2	0	Waiting

Challenge Pressure

Percent Complete



FIT TESTING CONCERNS

Because of how an elastomeric respirator functions (with an unfiltered exhaust valve) – the fit test operator is not being protected from the subject's possibly contaminated air.

Because of how quantitative fit testing is performed (with adapters or a probe) – the subject is not being protected from the operator's possibly contaminated air.

COVID CONSIDERATIONS FOR FIT TESTING

- Exposure to other people is the risk – this makes the operator's risk likely higher
- Implement COVID health screening (may send out before testing)
- Make any aspect possible either electronic or virtual/remote (i.e. training, signing fit test reports, etc.)
- Temperature/symptom checks at testing
- If any symptoms are reported or observed, do not perform the fit test
- Use as much space as possible (outside is best)
- PPE for fit test operator (choice on extent, but can include gloves, respirator, protective eyewear etc.)

**COVID
CONSIDERATIONS
FOR FIT TESTING
CONT.**

- Maintain physical distancing of at least 6ft at every point possible
- Face coverings for source control should be used during every part of the process possible (This can include the use of a covering over the exhaust valve of the respirator as long as it does not interfere with any aspect of fit)
- Allow only one test subject in the space at a given time
- Provide time for the space to clear out
- Wipe down common surfaces (including Quantifit, outside of tubing, and adapter)

QUANTIFIT/QUANTIFIT2 OPERATION

- The machine does not trap air in its system
- The adapters do not hold air
- The tubes are open to the environment
- The air pulled into the machine is from the surrounding environment
- The vast majority of any particulate matter pulled into the machine would be impacted within the machine itself as it is a turbulent environment for the air
- There is no **added** risk from the use of the Quantifit or QuantiFit2



QUESTIONS?

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