



# Qualitative vs. Quantitative fit testing

by Bob Millier, Med Compass Mobile Health Services

I mentioned to a fire chief the other day, how medical services for fire departments have changed since Med Compass began in 1985! The last 10 years in the State of Minnesota have especially seen the majority of fire departments turn to annual firefighter physicals and respirator fit testing. One question we field time and time again is, the difference between the two respirator fit testing methodologies, “which is which”, and what method offers the most accuracy!

OSHA’s regulation 1910.134 explains, those wearing respirators must be medically cleared to safely wear a respirator and the administering entity is responsible for ensuring those wearing them are annually fit tested for proper facepiece to face seal “fit”.

Respirator fit testing is performed to determine how well a respirator seal fits a person’s face. Either method of testing is meant to ensure not only maximum protection from contaminants, but the testing allows the firefighter to ‘know or train’ how a proper fitting mask feels on their face. With a respirator, if there is a leak or it is not worn properly the wearer could be exposed to potentially deadly chemicals. Granted, with an SCBA there is less concern than a pure cartridge-style arrangement; however, it will normally cause the supplied air to deplete more quickly.

There are two methods for administering a respirator fit test; both Qualitative and Quantitative.

Even though Qualitative methods are permitted by OSHA they are subjective and sometimes do not hold up if ever litigated. Qualitative fit testing uses a challenge agent like Bitrex or Saccharin, with this method being subjective and relying on the firefighter’s sense of taste or smell.

OSHA clearly states that Qualitative fit testing is acceptable for the SCBA masks that most firefighters wear. For clarification, there have been discussions with MN OSHA and MN OSHA Consultation stating that converting a positive pressure SCBA to a negative pressure system for “Qualita-

tive” fit testing is an acceptable method for an Interior Fire Fighter. The Qualitative testing certainly meets the intent of the standard and is “Compliant” as long as positive pressure SCBA’s are converted using the adapter provided by the manufacturer.

Quantitative respirator fit testing uses a device that measures exact leakage into the breathing zone of the respirator face piece. Contrary to popular perception, it actually takes less time to conduct a quantitative test than a qualitative because there is no taste or odor threshold screening time required. This measurement is objective, not requiring the firefighter to make a judgment, rather relying on the instrument to do it. The added benefit is noting the Fit Factor and then with a “Successful Pass”, a legal document is printed out. The best testing paradigm rotates in all of the department’s masks in the fit testing process, not just your own personal mask. Many times we uncover a firefighter’s mask or the “back up” mask that leaks around the face seal (maybe that’s why it was the back-up?). So the sound process is not to simply test everyone on a small, medium, or large, but rather test all masks that have the potential to be called on. To be clear, OSHA allows only two instruments to accomplish Quantitative fit testing; the OHD controlled negative pressure or the Portacount particulate counting instruments.

NFPA: With an updated 2007 standard, the National Fire Protection Association, however, requires that tight-fitting face pieces now be tested with a Quantitative Fit Test (QNFT) instead of the previously-approved Qualitative Fit Test (QLFT).

Med Compass believes that fire departments are taking an unneeded liability using the Qualitative fit testing method; Med Compass will only test our fire departments in a Quantitative method. Fire departments routinely take every step to minimize their exposure and liability in the call of safety.

Which ever method you choose to protect your firefighters, do something annually!!

OSHA Letter of Interpretation link  
[http://www.osha.gov/pls/owadisp.show\\_document?p\\_table=INTERPRETATIONS&p\\_id=22653](http://www.osha.gov/pls/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22653)

## NFPA 1500-20 2007

### 7.12 Fit Testing.

7.12.1\* The facepiece seal capability of each member qualified to use RPE shall be verified by quantitative fit testing on an annual basis and whenever new types of RPE or facepieces are issued.

7.12.2 The fit of the RPE of each new member shall be tested before the members are permitted to use RPE in a hazardous atmosphere.

7.12.2.1 Only members with a properly fitting facepiece shall be permitted by the fire department to function in a hazardous atmosphere with RPE.

7.12.3 Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative fit testing in the negative-pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

7.12.4\* Quantitative test protocols shall be conducted as required by the AHJ.

7.12.5 Records of facepiece fitting tests shall include at least the following information:

- (1) Name of the member tested
- (2) Type of fitting test performed
- (3) Specific make and model of facepieces tested
- (4) Pass/fail results of the tests

7.12.6\* For departments that perform quantitative fitting tests, the protection factor produced shall be at least 500 for negative-pressure facepieces for the person to pass the fitting test with that make of full facepiece. ❁