



# Quantitative Fit Testing CBRN Respirators

Connecticut Department of Correction

Attachment C  
11/06/2020  
AD 2.28

**Quantitative** Fit Testing for **CBRN** respirators will be conducted in accordance with **OSHA Fit Testing Protocols - Standard 1910.134 Appendix A.**

- Under no circumstances can any of the Fit Testing requirements be omitted or modified.
- Fit Testing for CBRN respirators must be conducted for all New Employees that are required to use respirators and annually thereafter.
- Fit Testing shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface.
- Test subjects cannot eat, drink (except plain water), smoke, or chew gum for fifteen (15) minutes before the test.

### **Apparatus:**

1. When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
2. The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
3. The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.
4. The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.
5. The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.
6. The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.
7. The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
8. The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
9. The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
10. When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
11. The limitations of instrument detection shall be taken into account when determining the fit factor.
12. Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

### **Procedural Requirements:**

1. When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
2. The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.



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3. *A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.*
4. *Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.*
5. *A stable test agent concentration shall be obtained prior to the actual start of testing.*
6. *Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.*
7. *The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.*

**Test Exercises:**

- *Under no circumstances can any of the Fit Testing requirements be omitted or modified.*
- *The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.*

Test Exercise	Requirements	Time
<b>Bending Over</b>	The test subject shall bend at the waist, as if going to touch his/her toes for 50 seconds and inhale 2 times at the bottom	Twenty (20) seconds, followed by Thirty (30) seconds
<b>Jogging in Place</b>	The test subject shall jog in place comfortably for 30 seconds	Thirty (30) seconds
<b>Turning Head Side to Side</b>	Standing in place, the subject shall slowly turn their head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can <i><b>inhale at each side.</b></i>	Thirty (30) seconds
<b>Moving Head Up and Down</b>	Standing in place, the subject shall slowly move their head up and down. The subject shall be instructed to <i><b>inhale when in the up position.</b></i>	Thirty (30) seconds
<b>Talking</b>	The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.	One (1) minute



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**Quantitative Respirator Fit Test Training Record**

Employee Name:	Employee Number:	Facility:
CBRN Respirator	PASS/FAIL	N/A
SCBA Respirator	PASS/FAIL	N/A
Employee Signature:	Date:	
Trainee Signature:	Date:	