Oregon
Kate Brown, Governor

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February 13, 2020

Text of changes

Sep. 26, 2019 Federal Register

Oregon OSHA's Adoption of Additional Federal OSHA Quantitative Fit Testing Protocols for Respirators

This rulemaking is to keep Oregon OSHA in harmony with recent changes to federal OSHA's standards.

On September 26, 2019, federal OSHA adopted final rules for adding two additional PortaCount® quantitative fit testing protocols to its Respiratory Protection Standard (29 CFR 1910.134, Appendix A). These new protocols are: the modified ambient aerosol condensation nuclei counter (MCNC) quantitative fit testing protocol for full-facepiece and half-mask elastomeric respirators (MCNC-ER); and the modified ambient aerosol condensation nuclei counter quantitative fit testing protocol for filtering facepiece respirators (MCNC-FFR). Both protocols (MCNC-ER and MCNC-FFR), are abbreviated variations of the current federal OSHA-accepted ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol (also referred to as the PortaCount® protocol). However, both new protocols differ from the original PortaCount® method by exercise sets, exercise durations, and sampling sequence.

For Oregon OSHA's rulemaking purposes, these protocols will serve as alternatives to the four existing quantitative fit testing protocols already listed in Appendix A of the Respiratory Protection Standard and will maintain safety and health protections for workers while providing additional flexibility and reducing compliance burdens for employers. Appendix A in the Respiratory Protection Standard (29 CFR 1910.134) and Appendix A in OAR 437-004-1041 (Oregon OSHA's agriculture respiratory protection standard), are amended to include both the MCNC-ER and MCNC-FFR protocols. These protocols cover and will be available to employers in general industry, construction, and agriculture (through amendment of 437-004-1041 to include these additions).

Oregon OSHA also adopted the addition of the controlled negative pressure (CNP) REDON quantitative fit testing protocol to Appendix A of OAR 437-004-1041. The Respiratory Protection Standard (29 CFR 1910.134) already has the CNP REDON protocol listed as an option to general industry and construction employers. This will improve compliance homogeneity between the Respiratory Protection Standard (29 CFR 1910.134) and OAR 437-004-1041, and provide each employer group with the same quantitative fit testing protocol options.

One hearing was held on January, 7, 2020, at the Oregon OSHA Salem Field Office. There were no public comments given at the hearing. The agency received two public comments during the comment period, and at the end of the comment period decided to adopt the rulemaking changes as proposed.

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This is Oregon OSHA Administrative Order 1-2020, Adopted and effective February 13, 2020.

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Certificate and Order for Filing

PERMANENT ADMINISTRATIVE RULES

I certify that the attached copies* are true, full and correct copies of the PERMANENT Rule(s) adopted on February 13, 2020 by the
Date prior to or same as filing date

Department of Consumer & Business Services/Oregon Occupational Safety & Health Division 437
Agency and Division — Administrative Rules Chapter Number

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Rules Coordinator — Address — Telephone

to become effective February 13, 2020 as Oregon OSHA Administrative Order 1-2020.
Date upon filing or later

Rulemaking Notice was published in the December, 2019 *Oregon Bulletin*.**
Month and Year

RULE CAPTION

Adopt Additional Federal OSHA Quantitative Fit Testing Protocols for Respirators.
Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.

RULEMAKING ACTION

AMEND: OAR 437-002-0120, 437-004-1041

ORS 654.025(2), 656.726(4)
Stat. Auth.

ORS 654.001 through 654.295
Stats. Implemented

RULEMAKING SUMMARY

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Oregon OSHA also adopted the addition of the controlled negative pressure (CNP) REDON quantitative fit testing protocol to Appendix A of OAR 437-004-1041. The Respiratory Protection Standard (29 CFR 1910.134) already has the CNP REDON protocol listed as an option to general industry and construction employers. This

will improve compliance homogeneity between the Respiratory Protection Standard (29 CFR 1910.134) and OAR 437-004-1041, and provide each employer group with the same quantitative fit testing protocol options.

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INDIVIDUAL RULE SUMMARY (By rule number)

Provide a brief summary of the rule (if new adoption), or a brief summary of changes made to the rule (if amending)

437-002-0120 – Adoption by reference, Part I.A.14 and Part I.C of Appendix A of 29 CFR 1910.134, to include references to both additional quantitative fit testing protocols (MCNC-ER and MCNC-FFR) for respirators. In Part I.C.3, remove the terms, "Portacount™" and "Portacount," and add in their place the term "PortaCount®." Re-designate Sections C.4 and C.5 of Appendix A, as C.6 and C.7. Add the new MCNC-ER protocol to C.4 and MCNC-FFR protocol to C.5.

437-004-1041 – Amend Part I.A.13(a) and Part I.C of Appendix A of OAR 437-004-1041, to include references to both additional quantitative fit testing protocols (MCNC-ER and MCNC-FFR) for respirators. Add the Controlled Negative Pressure (CNP) REDON Quantitative Fit Testing Protocol to the list of available fit testing protocols in Appendix A under new Part I.C.7. Re-designate section Part I.C.4 of Appendix A, as Part I.C.6. Add the new MCNC-ER protocol to Part I.C.4 and MCNC-FFR protocol to Part I.C.5. In Part I.C.3, remove the terms, "Portacount™" and "Portacount," and add in their place the term "PortaCount®."

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Authorized Signer	Michael D. Wood Printed name	2/13/2020 Date

*With this original, file one photocopy of certificate, one paper copy of rules listed in Rulemaking Actions, and electronic copy of rules.
**The *Oregon Bulletin* is published on the 1st of each month and updates rules found in the OAR Compilation. For publication in Bulletin, rule and notice filings must be submitted by 5:00 pm on the 15th day of the preceding month unless this deadline falls on a weekend or legal holiday, when filings are accepted until 5:00 pm on the preceding workday. ARC 930-2005

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PERMANENT ADMINISTRATIVE ORDER

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OSHA 1-2020
CHAPTER 437
DEPARTMENT OF CONSUMER AND BUSINESS SERVICES
OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION

FILING CAPTION: Adopt Additional Federal OSHA Quantitative Fit Testing Protocols for Respirators.

EFFECTIVE DATE: 02/13/2020

AGENCY APPROVED DATE: 02/13/2020

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Filed By:
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RULES:
437-002-0120, 437-004-1041

AMEND: 437-002-0120

RULE TITLE: Adoption by Reference

NOTICE FILED DATE: 11/26/2019

RULE SUMMARY: Adoption by reference. Part I.A.14 and Part I.C of Appendix A of 29 CFR 1910.134, to include reference to both additional quantitative fit testing protocols (MCNC-ER and MCNC-FFR) for respirators. In Part I.C.3, remove the terms "PortacountTM" and "Portacount" and add in their place the term "PortaCountR". Re-designate Sections C.4 and C.5 of Appendix A, as C.6 and C.7, Add the new MCNC-ER protocol to C.4 and MCNC-FFR protocol to C.5.

RULE TEXT:
In addition to, and not in lieu of, any other health and safety codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:
(1) 29 CFR 1910.132 General requirements. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
(2) 29 CFR 1910.133 Eye and face protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
(3) 29 CFR 1910.134 Respiratory protection, published 9/26/19, FR vol. 84, no. 187, p. 50739.
(4) 29 CFR 1910.135 Occupational head protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
(5) 29 CFR 1910.136 Occupational foot protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
(6) 29 CFR 1910.137 Electrical protective equipment, published 4/11/14, FR vol. 79, no. 70, p. 20316.
(7) 29 CFR 1910.138 Hand Protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.

(8) 29 CFR 1910.139 Reserved.
(9) 29 CFR 1910.140 Personal fall protection, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.
(10) Appendices.
(a) Appendix A – References for further information (nonmandatory).
(b) Appendix B – Nonmandatory compliance guidelines for hazard assessment and personal protective equipment selection; amended with OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.
(c) Appendix C to Subpart I of Part 1910 – Personal Fall Protection Systems Non-Mandatory Guidelines, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.
(d) Appendix D to Subpart I of Part 1910 – Test Methods and Procedures for Personal Fall Protection Systems Non-Mandatory Guidelines, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.
These standards are available from the Oregon Occupational Safety and Health Division (OR-OSHA), Department of Consumer and Business Services; and the United States Government Printing Office.

STATUTORY/OTHER AUTHORITY: ORS 654.025(2), 656.726(4)

STATUTES/OTHER IMPLEMENTED: ORS 654.001 - 654.295

AMEND: 437-004-1041

RULE TITLE: Respiratory Protection

NOTICE FILED DATE: 11/26/2019

RULE SUMMARY: Amend Part I.A.13(a) and Part I.C of Appendix A to include references to both additional qualitative fit testing protocols (MCNC-ER and MCNC-FFR) for respirators. Add the Controlled Negative Pressure (CNP) REDON quantitative fit testing protocol to the list of available fit testing protocols in Appendix A under new Part I.C.7. Re-designate section Part I.C.4 of Appendix A as Part I.C.6. Add the new MCNC-ER protocol to Part I.C.4 and MCNC-FFR protocol to Part I.C.5. In Part I.C.3, remove the terms "PortacountTM" and "Portacount" and add in their place the term "PortaCountR".

RULE TEXT:

(1) Permissible practice.

(a) To control occupational diseases caused by breathing contaminated air, the best method is to prevent contamination with engineering controls. To the extent feasible, accepted engineering controls must be used. Examples of engineering controls include enclosing the source of contamination, providing general or local exhaust ventilation to remove the contaminated air from work areas, and substituting less toxic materials. When this approach is not feasible, or while engineering controls are being established, employers must provide appropriate respirators in compliance with this standard.

(b) You must provide a respirator to each employee when it is necessary to protect their health. Respirators must be appropriate for the hazard. You must also establish and maintain an effective respiratory protection program that includes at least the requirements outlined in paragraph (3) of this standard. The program must cover each employee required to use a respirator.

(2) Definitions. The following definitions apply to this standard. Air-purifying respirator is a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element. Assigned protection factor (APF) means 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 as specified by this section. Atmosphere-supplying respirator is 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 is a container with a filter, sorbent, or catalyst, or combination of these items, that removes specific contaminants from the air passed through the container. Competent person is a person who, because of training and experience, can identify existing and predictable hazards in equipment, material, conditions or practices and who has the knowledge and authority to take corrective steps. Demand respirator is an atmosphere-supplying respirator that admits breathing air to the face piece only when inhalation creates a negative pressure inside the face piece. Elastomer (elastomeric) is an elastic substance like rubber or neoprene. Emergency situation is any event such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant. Employee exposure is exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection. End-of-service-life indicator (ESLI) is a device, on the cartridge, that warns respirator users when their respirator is near the end of its ability to protect them. For example, an indicator on the cartridge will change to warn the user that the cartridge sorbent material is nearing saturation and is no longer effective. Engineering control measures are methods to eliminate or control employee exposure to the hazard; e.g., substitution of a less toxic material, general or local ventilation and enclosing the operation. Escape-only respirator is a respirator only for use during emergency exit. Filter or air purifying element is a respirator component (e.g., canister or cartridge) that removes solid or liquid aerosols from the inspired air. Filtering face piece (dust mask) is a tight fitting negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece made of the filtering medium. Fit factor is a quantitative estimate of the fit of a particular respirator to a specific person, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the

respirator when worn. Instrumentation is used with ambient air as the “test agent” to quantify the respirator fit. See Appendix A. Fit test is the use of procedures in Appendix A to qualitatively or quantitatively evaluate the fit of a respirator on a person. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.) Helmet is a rigid respirator covering that also provides head protection against impact and penetration. High efficiency particulate air (HEPA) filter is a filter that is at least 99.97 percent efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters. Hood is a respirator covering that completely covers the head and neck and may also cover portions of the shoulders and torso. Immediately dangerous to life or health (IDLH) is an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous atmosphere. Interior structural firefighting is the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. Loose-fitting face piece is a respiratory covering that forms a partial seal with the face, e.g., hood. Maximum use concentration (MUC) means 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 on the basis of relevant available information and informed professional judgment. Negative pressure respirator (tight fitting) is a respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator. Oxygen deficient atmosphere is an atmosphere with an oxygen content less than 19.5 percent by volume. Physician or other licensed health care professional (PLHCP) is a person whose legally permitted scope of practice (i.e., license, registration, or certification) allows them to independently provide, or be delegated to provide, some or all of the health care services required by this standard. Positive pressure respirator is a respirator in which the pressure inside the respiratory covering is higher than the air pressure outside the respirator. Powered air-purifying respirator (PAPR) is an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering. Pressure demand respirator is a positive pressure atmosphere-supplying respirator that admits breathing air to the face piece when inhalation reduces the positive pressure inside the face piece. Qualitative fit test (QLFT) is a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual’s response to the test agent. See Appendix A. Quantitative fit test (QNFT) is an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator. See Appendix A. Respirator covering is that part 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 face piece, helmet, hood, suit, or a mouthpiece respirator with nose clamp. Self-contained breathing apparatus (SCBA) is an atmosphere-supplying respirator for which user carries the breathing air source. Service life is the period of time that a respirator, filter or sorbent, or other respiratory equipment adequately protects the wearer. Supplied-air respirator (SAR) or airline respirator is an atmosphere-supplying respirator for which the source of breathing air is not carried by the user. Tight-fitting face piece is a respirator covering that forms a complete seal with the face, e.g., half mask or full-face piece. User seal check is an action by the respirator user to determine if the respirator is properly seated to the face. See appendix B-1.

(3) Respiratory protection program.

(a) When respirators are necessary to protect the health of workers or when you require workers to wear them, you must have an effective, written respiratory protection program, managed by a knowledgeable person, with procedures specific to your work site. Keep the program updated to reflect changes in conditions that require the use of respirators. You must include at least these points, as applicable:

(A) Procedures for selecting respirators for use in the workplace;

(B) Procedures for the medical evaluations of employees required to use respirators;

(C) Fit testing procedures for tight-fitting respirators;

(D) Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;

(E) Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
(F) Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
(G) Procedures for training employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
(H) Procedures for training employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
(I) Procedures for regularly evaluating the effectiveness of the program.
(b) The employer must provide respirators, and all other program requirements including training, and medical evaluations at no cost to the employee.
(c) Where respirator use is voluntary:
(A) You may provide respirators to employees who request them or they may use their own respirators. If you allow this voluntary use;
(i) You must determine that it will not create a hazard to the user;
(ii) You must provide the voluntary user with the information in Appendix D, "Information for Employees Using Respirators When Not Required Under the Standard"; and
(B) You must have a limited written respiratory program for voluntary users. It must include those parts of the standard program necessary to ensure that:
(i) The user is medically able to use the respirator without adverse health effects. Users of tight-fitting respirators other than dust masks must have a medical evaluation.
(ii) The user will properly clean, store and maintain the respirator.
(4) Selection of respirators. Identify and evaluate the respiratory hazard(s) including a reasonable estimate of employee exposures and an identification of the contaminant's chemical state and physical form. You must treat atmospheres with the potential for IDLH conditions as an IDLH hazard and provide appropriate respiratory protection.
(a) General requirements.
(A) You must evaluate respiratory hazards, conditions in the workplace and user factors, then select and provide the appropriate respirators.
(B) All respirators must have NIOSH certification and all use must conform to that certification.
(C) Respirators must correctly fit and be acceptable to the user.
(b) Respirators for IDLH atmospheres.
(A) Provide the following respirators for employee use in IDLH atmospheres:
(i) A full-face piece pressure demand SCBA certified by NIOSH for a minimum service life of 30 minutes, or
(ii) A combination full-face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
(B) Respirators only for escape from IDLH atmospheres must have NIOSH certification for escape from the atmosphere of use.
(C) Treat all oxygen-deficient atmospheres as IDLH.

EXCEPTION to paragraph (4)(b)(C): If you can demonstrate that under all foreseeable conditions, the oxygen concentration will stay within the ranges in Table A for the appropriate altitudes set out in the table, then your selection of atmosphere-supplying respirators is not limited to the types listed in (4)(b)(A). Table A

(c) Respirators for atmospheres that are not IDLH.
(A) Provide respirators adequate to protect the health of workers and ensure compliance with all other OR-OSHA requirements, under routine and reasonably foreseeable emergency situations.
(i) Assigned Protection Factors (APFs). Employers must use the assigned protection factors listed in Table B to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate

to the mode of operation in which the respirator is being used. Table B.
(ii) Maximum Use Concentration (MUC).
(I) The employer must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.
(II) Employers must not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in paragraph (4)(b) of this standard.
(III) When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.
(B) The respirator must be appropriate for the chemical state and physical form of the contaminant.
(C) For protection against gases and vapors, provide:
(i) An atmosphere-supplying respirator, or
(ii) An air-purifying respirator, if:
(I) It has and end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or
(II) If there is no ESLI appropriate for your conditions, implement a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. Describe in the respirator program the information and data relied on and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

NOTE: The Worker Protection Standard contains criteria for specific change out schedules for respirator canisters and cartridges. See Division 4/W, 170.240.

(D) For protection against particulates, provide:
(i) An atmosphere-supplying respirator; or
(ii) An air-purifying respirator with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator with a filter certified for particulates by NIOSH under 42 CFR part 84; or
(iii) For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator with any filter certified for particulates by NIOSH.
(5) Medical evaluation. Using a respirator may place a physiological burden on employees that depends on the type of respirator, the job and workplace conditions in which the respirator is used, and the medical status of the employee.
(a) General. You must provide medical evaluations to determine each worker's ability to use a respirator without causing adverse health effects. Do this before the worker's fit test and before they perform any work requiring respirator use. The employer may discontinue an employee's medical evaluations when the employee no longer uses a respirator.
(b) Medical evaluation procedures. The employer must identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial examination that obtains the same information as the medical questionnaire. The medical evaluation must obtain the information requested by the questionnaire in Appendix C, Part A, Sections 1 and 2, of this standard.

NOTE: If the employee refuses the examination, they may not be permitted to work in jobs that require a tight-fitting respirator.

(c) Follow-up medical examination.
(A) The employer must ensure that a follow-up medical examination is provided for an employee if, in the opinion of the PLHCP, this is necessary.

NOTE: The PLHCP may require a follow-up examination for an employee who gives a positive response to any question among questions 1 through 9, or 10 through 15 in Appendix C, Part A, Section 2; or whose initial medical examination

demonstrates the need for a follow-up medical examination.

(B) The follow-up medical examination must include any medical tests, consultations, or diagnotic procedures that the PLHCP deems necessary to make a final determination.
(d) Administration of the medical questionnaire and examinations.
(A) You must allow the employee to complete the questionnaire in a way that protects the confidentiality of the information. Employers are not allowed to see the answers or to review the completed form. You must allow employees to complete the form during normal working hours or at a time and place convenient to them. If employees need help, allow them to ask your PLHCP or anybody other than their employer or representtatives of their employer.
(B) The employer must provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.
(e) Supplemental information for the PLHCP.
(A) You must give the PLHCP the required supplemental information before they make any recommendation about a worker's ability to use a respirator. Use Appendix C, Part B, Section 2 of this standard, or an equivalent form to provide this information.
(i) The type and weight of the respirator the employee will use;
(ii) How long and how often the employee will use the respirator (including use for rescue and escape);
(iii) The expected physical work effort while using the respirator;
(iv) Additional protective clothing and equipment to be worn; and
(v) Temperature and humidity extremes that may exist during use.
(B) Supplemental information you provide for an employee's medical evaluation does not have to be provided again for later evaluations unless the information or the PLHCP changes.
(C) You must provide a copy of your written respiratory program and this standard to the PLHCP.

Note to Paragraph (5)(e): When the employer replaces a PLHCP, the employer must ensure that the new PLHCP has this information, either by providing the documents directly to the new PLHCP or by having the documents transferred from the former PLHCP to the new PLHCP. However, OR-OSHA does not expect employers to have employees medically reevaluated solely because there is a new PLHCP.

(f) Medical determination. In determining the employee's ability to use a respirator, the employer must:
(A) Obtain a written recommendation about the employee's ability to use the respirator from the PLHCP. The recommendation must provide only the following information:
(i) Any limitations on respirator use relating to the medical condition of the employee, or relating to the workplace conditions, including whether or not the employee is medically able to use the respirator;
(ii) The need, if any, for follow-up medical evaluations; and
(iii) A statement that the PLHCP gave a copy of the recommendation to the worker.
(B) If the respirator is a negative pressure respirator and the PLHCP finds that using it would increase the employee's health risk, the employer must provide a PAPR until a subsequent evaluation clears the employee for another type.
(g) Additional medical evaluations. At a minimum, the employer must provide additional medical evaluations that comply with this standard if:
(A) An employee reports medical signs or symptoms related to ability to use a respirator;
(B) A PLHCP, supervisor, or the knowledgeable person who manages the respiratory protection program informs the employer that an employee needs a reevaluation; or
(C) Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or
(D) A change occurs in work conditions (such as physical work effort, protective clothing, and temperatures) that may result in a substantial increase in the physiological burden to the employee.

(6) Fit testing. You must:
(a) Ensure that employees using a tight-fitting face piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT), using the same make, model, style and size respirator that they will use in the workplace.
(b) Ensure that each worker using a tight-fitting face piece respirator is fit-tested, before initial respirator use; whenever they change to another type, style, model, or make of respirator, and at least annually thereafter.
(c) Do a new fit test on a worker when you observe or the worker, a supervisor, the program administrator, or a PLCHP report any change in the worker's physical condition that could affect the respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
(d) Give employees a reasonable opportunity to select a different respirator face piece and redo the fit test if, after passing a QLFT or QNFT, the employee notifies the employer, supervisor, or PLHCP that the fit of the respirator is unacceptable.
(e) Ensure that all fit tests comply with the accepted QLFT or QNFT protocols in Appendix A of this standard.
(f) Ensure that qualitative fit tests (QLFT) are used only to fit test negative pressure air-purifying respirators that must achieve an assigned protective factor of 50 or less.
(g) Ensure that quantitative fit tests (QNFT), using an accepted QNFT protocol, are only passed by achieving a fit factor of 100 or more for a tight fitting half face piece respirator, and a fit factor of 500 or more for a tight fitting full face piece respirator.
(h) Ensure that fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators is only accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
(A) Do qualitative fit testing of these respirators by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
(B) Do quantitative fit testing of these respirators by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. Do this by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a way to sample air from inside the face piece.
(C) Before returning a face piece to normal use, completely remove any modifications done for fit testing, and restore the face piece to NIOSH-approved configuration.
(7) Use of respirators.
(a) Face piece seal protection.
(A) You must not permit workers to wear tight-fitting face pieces if they have:
(i) Facial hair that comes between the face-to-face piece sealing surface or that interferes with the respirator's valve function; or
(ii) Any other condition that interferes with the face-to-face piece seal or valve function.
(B) If an employee wears glasses or goggles or other personal protective equipment, the employer must ensure that it does not interfere with the seal of the face piece to the face of the user.
(C) Employers must ensure that workers who wear respirators perform a user seal check before every use, using the procedures in Appendix B-1 or, if equally effective, the recommendations of the respirator manufacturer.
(b) Continuing respirator effectiveness.
(A) You must reevaluate the effectiveness of a respirator when there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness.
(B) You must ensure that employees leave the area where respirators are required:
(i) To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use; or
(ii) If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece; or

(iii) To replace the respirator or the filter, cartridge, or canister elements.
(C) If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the employer or a competent person must replace or repair the respirator before allowing the employee to return to the work area.
(c) Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer must ensure that:
(A) One employee or, when needed, more than one employee is stationed outside the IDLH atmosphere;
(B) Visual, voice, or line communication is continuous between the employee(s) in the IDLH atmosphere and the employee(s) outside the IDLH atmosphere;
(C) The employee(s) outside the IDLH atmosphere have the training and equipment to provide effective emergency rescue;
(D) The employer or designee is notified before the employee(s) outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;
(E) The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;
(F) Employee(s) outside the IDLH atmospheres have:
(i) Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either:
(ii) Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
(iii) Equivalent means for rescue when there is no requirement for retrieval equipment under paragraph (7)(c)(F)(ii).
(d) Procedures for interior structural firefighting. If you require your workers to fight interior structural fires, paragraph (7)(c) applies. You must also do the following:
(A) At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times; and
(B) At least two employees are located outside the IDLH atmosphere; and
(C) All employees engaged in interior structural firefighting use SCBA's.

NOTE 1 to paragraph (7)(d):One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety of health of any firefighter working at the incident.

NOTE 2 to paragraph (7)(d): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

(8) Maintenance and care of respirators.
(a) Cleaning and disinfecting. You must provide each respirator user with a respirator that is clean, sanitary, and in good working order. You also must ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2, or equally effective procedures recommended by the respirator manufacturer, at the following intervals:
(A) Clean and disinfect respirators used exclusively by one worker as often as necessary to keep them sanitary;
(B) Clean and disinfect respirators after each use, or before being worn by different individuals, if used by more than one worker;
(C) Clean and disinfect emergency use respirators after each use; and
(D) Clean and disinfect fit test and training respirators after each use.
(b) Storage. Ensure that respirators are stored as follows:
(A) Store all respirators to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive

moisture, damaging chemicals, and to prevent deformation of the face piece and exhalation valve.
(B) In addition to the requirements of paragraph (8)(b)(A), keep emergency respirators:
(i) Accessible to the work area;
(ii) In compartments or in covers clearly marked as containing emergency respirators; and
(iii) In accordance with any applicable manufacturer instructions.
(c) Inspections.
(A) The employer must require respirator inspections as follows:
(i) Inspect all routine use respirators before each use and during cleaning;
(ii) Inspect emergency use respirators at least monthly and according to the manufacturer's recommendations. Check for proper function before and after each use; and
(iii) Inspect escape respirators before taking them into the workplace for use.
(B) The employer must ensure that respirator inspections include the following:
(i) A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters; and
(ii) A check of elastomeric parts for pliability and signs of deterioration.
(C) In addition to the requirements of paragraphs (8)(c)(A) and (B), inspect self-contained breathing apparatus monthly. Keep air and oxygen fully charged and recharge them when the pressure falls to 90 percent of the manufacturer's recommended pressure level. Be certain the regulator and warning devices work properly.
(D) For emergency use respirators, the employer must:
(i) Certify the respirator by documenting the date of inspection, the name (or signature) of the inspector, the findings, required remedial action, and a serial number or other means of identifying the respirator; and
(ii) Provide this information on a tag or label attached to the respirator storage compartment, or keep it with the respirator, or include it in paper or electronic inspection reports. Keep this information until the next report replaces it.
(d) Repairs. Do not use respirators that fail an inspection or are otherwise defective. Either discard them or repair them according to these procedures:
(A) Only people with appropriate training may repair or adjust respirators. They must use only the manufacturer's NIOSH-approved parts designed for the particular respirator;
(B) Repairs must conform to the manufacturer's recommendations for the type of repair to be performed;
(C) Only the manufacturer or a technician trained by the manufacturer may repair or adjust the reducing and admission valves, regulators and alarms.
(9) Breathing air quality and use.
(a) The employer must ensure or have their supplier certify that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration meets the following specifications:
(A) Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and
(B) Compressed breathing air must meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
(i) Oxygen content (v/v) between 19.5 and 23.5 percent;
(ii) Hydrocarbon (condensed) content of no more than 5 milligrams per cubic meter of air;
(iii) Carbon monoxide (CO) content of no more than 10 ppm;
(iv) Carbon dioxide content of no more than 1,000 ppm; and
(v) No noticeable odor.

NOTE: Do not fill your own air vessels unless they and the contents meet all the requirements of this standard.

(b) Do not use compressed oxygen in atmosphere-supplied respirators that previously held compressed air.
(c) The employer must ensure that oxygen concentrations more than 23.5 percent are used only in equipment designed

for oxygen service or distribution.
(d) The employer must ensure that cylinders to supply breathing air to respirators meet the following requirements:
(A) Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180);
(B) Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and
(C) The moisture content in the cylinder does not exceed a dew point of –50 degrees F. (-45.6 degrees C.) at 1 atmosphere pressure.
(e) The employer must ensure that compressors supplying breathing air to respirators are constructed and situated to:
(A) Prevent entry of contaminated air into the air-supply system;
(B) Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F. (5.56 degrees C.) below the ambient temperature;
(C) Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Maintain and replace sorbent beds and filters according to the manufacturer's instructions.
(D) Have a tag at the compressor showing the most recent change date and the signature of the authorized person who did the change.
(f) For compressors that are not oil-lubricated, ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.
(g) For oil-lubricated compressors, use only a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If you use only high-temperature alarms, monitor the air supply often enough to prevent carbon monoxide in the breathing air from exceeding 10 ppm.
(h) The employer must ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. Do not allow any asphyxiating substance to get into breathing airlines.
(i) Use only the respirator manufacturer's NIOSH approved breathing gas containers marked and maintained in accordance with the Quality Assurance provisions of the NIOSH approval for the SCBA, as issued in accordance with the NIOSH respirator certification standard at 42 CFR part 84.
(10) Identification of filters, cartridges, and canisters. The employer must ensure that all filters, cartridges and canisters have labels and color codes that comply with the NIOSH standards and that the label remains in place and legible.
(11) Training and information.
(a) The employer must ensure that each employee can demonstrate knowledge of at least the following:
(A) Why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator;
(B) What the limitations and capabilities of the respirator are;
(C) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
(D) How to inspect, put on and remove, use, and check the seals of the respirator;
(E) What the procedures are for maintenance and storage of the respirator;
(F) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
(G) The general requirements of this rule.
(b) Training must be in a language or form that workers understand.
(c) Training must be complete before workers use respirators.
(d) Retrain respirator users annually and when these situations happen:
(A) Changes in the work or the type of respirator make previous training obsolete;
(B) Inadequacies in the employee's knowledge or use of the respirator indicate that they no longer have the basic understanding or skill; or
(C) Any other situation arises in which retraining appears necessary to ensure safe respirator use.
(e) An employer who can demonstrate that a new employee has training within the last 12 months that addresses the

elements in paragraph (11)(a)(A) through (G) does not have to repeat that training if, the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.
(f) Provide every voluntary respirator user with the basic advisory information in Appendix D. Any written or oral format that the employee understands is acceptable.
(12) Program evaluation.
(a) Evaluate the workplace as necessary to ensure effective implementation of the current written program.
(b) Regularly consult your respirator users to get their views on your program's effectiveness and to identify problems. Correct the problems identified. Things to assess include at least:
(A) Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
(B) Users have and use the correct respirator and components for their exposure hazards;
(C) Proper respirator use; and
(D) Proper respirator maintenance.
(13) Recordkeeping.
(a) Medical evaluation. Retain and make available all medical evaluations required by this standard according to Division 2/Z, 1910.1020. (Division 4/A, 437-004-0005, Medical Records Access, stipulates that Division 2/Z, 1910.1020 applies to agricultural employers.)
(b) Fit testing.
(A) You must keep a record of qualitative and quantitative fit tests for each user including:
(i) The name or identification of the employee;
(ii) Type of fit test;
(iii) Specific make, model, style, and size of respirator tested;
(iv) Date of test; and
(v) The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.
(B) Keep fit test records until records of a new test replace them.
(c) You must keep a written copy of your current respirator program.
(d) On request, you must make written records required by this standard, available to the Oregon OSHA Administrator or their designee for examination or copying.
(14) Appendices. Compliance with Appendix A, Appendix B-1, Appendix B-2, Appendix C, and Appendix D of this rule is mandatory.
(15) Effective Date. OAR 437-004-1041, Respiratory Protection, is effective March 1, 2007. Appendices.

STATUTORY/OTHER AUTHORITY: ORS 654.025(2), 656.726(4).

STATUTES/OTHER IMPLEMENTED: ORS 654.001 - 654.295.

Table A	
Altitude (ft.)	**Oxygen deficient Atmospheres (% 0_2) for which the employer may rely on atmosphere-supplying respirators**
Less than 3,001	16.0-19.5
3,001-4,000	16.4-19.5
4,001-5,000	17.1-19.5
5,001-6,000	17.8-19.5
6,001-7,000	18.5-19.5
7,001-8,000[1]	19.3-19.5

[1] This exception does not apply to altitudes above 8,000 feet. Oxygen-enriched breathing air must be supplied above 14,000 feet.

Table B. -- Assigned Protection Factors[5]

Type of respirator[1, 2]	Quarter mask	Half mask	Full facepiece	Helmet/ hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	[3]10	50	……..	…….
2. Powered Air-Purifying Respirator (PAPR)	……...	50	1,000	[4]25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	……..	10	50	……...	……...
• Continuous flow mode	……..	50	1,000	[4]25/1,000	25
• Pressure-demand or other positive-pressure mode	…….	50	1,000	……...	……...
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	……..	10	50	50	……...
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	……...	……..	10,000	10,000	……...

Notes:

1 Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

2 The assigned protection factors in Table B are only effective when the employer implements a continuing, effective respirator program as required by this section (Division 4/I, 437-004-1041), including training, fit testing, maintenance, and use requirements.

3 This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

4 The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

5 These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by Division 4/Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by Division 4/I, 437-004-1041(4)(b)(B).

Appendix A to OAR 437-004-1041, Respiratory Protection – Fit Testing Procedures (Mandatory)

Part I. Acceptable Fit Test Procedures

A. Fit Testing Procedures – General Requirements. These fit test procedures are mandatory and apply to both Qualitative Fit Tests (QLFT) and Quantitative Fit Tests (QNFT).

(1) Provide enough respirators so the employee can choose an acceptable model that fits correctly. Be sure they understand that they must select a respirator that gives the best fit.

(2) Before the employee selects their respirator you must show them how to put on a respirator, how to position it on their face, how to set the strap tension and how to make sure the fit is acceptable. There must be a mirror for them to use when evaluating the position and fit. This instruction does not replace the required formal training.

(3) They must hold each face piece they choose up to their face to find the one with the best fit.

(4) Once they choose a mask, have them wear it for at least 5 minutes to evaluate the comfort level. Discuss the points in the following paragraph to assure the worker makes a good evaluation. If they are not familiar with using a particular respirator, have them put it on and take it off several times to assure they make the needed adjustments for a good fit.

(5) Assessment of comfort must include a review of the following points with the test subject and allowing the test subject enough time to determine the comfort of the respirator:

(a) Position of the mask on the nose

(b) Room for eye protection

(c) Room to talk

(d) Position of mask on face and cheeks

(6) Use the following criteria to help determine the adequacy of the respirator fit:

(a) Chin properly placed;

(b) Adequate strap tension, not too tight;

(c) Fit across nose bridge;

(d) Respirator of proper size to span distance from nose to chin;

(e) Tendency of respirator to slip;

(f) Self-observation in mirror to evaluate fit and respirator position.

(7) Have the employee do a user seal check according to Appendix B-1. Before they do the check have them seat the mask by moving their head from side to side and up and down slowly while taking a few deep breaths. If the test fails, have them select another mask.

(8) Do not do the test if the employee has any hair (including beard stubble) between the skin and sealing surface. They must alter or remove any clothing or items that interfere with the fit.

(9) If the testing employee shows signs of difficult breathing during the test, send them to a PLHCP to evaluate their ability to use a respirator.

(10) If the employee finds the fit unacceptable, you must allow them to select another respirator and retest.

(11) Exercises. Before beginning the fit test, give the worker a description of the test and advise them of their responsibilities during the test. The description must include the exercises. They must wear the respirator for 5 minutes before the start of the test.

(12) During the test the employee must wear any other safety equipment normally required for their work, if it could interfere with the respirator fit.

(13) Test Exercises.

(a) [~~The worker must do these test exercises for all fit test methods except CNP. There are different exercises for CNP. The worker must do these in the test environment as follows:~~]

Employers must perform the following test exercises for all fit testing methods prescribed in this Appendix, except for the two modified ambient aerosol CNC quantitative fit testing protocols, the CNP quantitative fit testing protocol, and the CNP REDON quantitative fit testing protocol. For the modified ambient aerosol CNC quantitative fit testing protocols, employers shall ensure that the test subjects (*i.e.*, employees) perform the exercise procedure specified in Part I.C.4(b) of this Appendix for full-facepiece and half-mask elastomeric respirators, or the exercise procedure specified in Part I.C.5(b) for filtering facepiece respirators. Employers must ensure that the test subjects (*i.e.,* employees) perform the exercise procedure described in Part I.C.6(b) of this Appendix for the CNP quantitative fit testing protocol, or the exercise procedure described in Part I.C.7(b) of this Appendix for the CNP REDON quantitative fit-testing protocol. For the remaining fit testing methods, employers shall ensure that the test exercises are performed in the appropriate test environment in the following manner:

(1) Normal breathing. In a normal standing position, without talking, the subject must breathe normally.

(2) Deep breathing. In a normal standing position, the subject must breathe slowly and deeply, taking caution so as not to hyperventilate.

(3) Turning head side to side. Standing in place, the subject must slowly turn their head from side to side between the extreme positions on each side. The head must be held at each extreme momentarily so the subject can inhale at each side.

(4) Moving head up and down. Standing in place, the subject must slowly move their head up and down. Instruct the subject to inhale in the up position (i.e., when looking toward the ceiling).

(5) Talking. The subject must talk out loud slowly and loud enough 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.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject must grimace by smiling or frowning. (This applies only to QNFT testing; it is not for QLFT.)

(7) Bending over. The test subject must bend at the waist as if they were to touch their toes. Substitute jogging in place for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Do each test exercise for 1-minute except for the grimace exercise which is only for 15 seconds. Ask the test subject about the comfort of the respirator upon completion of the procedure. If there are problems, try another respirator. Do not adjust the respirator after the fit test exercises begin. Any adjustment voids the test.

B. Qualitative Fit Test (QLFT) Procedures

(1) General

(a) The employer must ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment works properly.

(b) The employer must ensure that QLFT equipment is clean and well maintained so as to operate within its design parameters.

(2) Isoamyl Acetate Procedures

Note: This procedure is not appropriate to use for the fit testing of particulate respirators unless the particulate cartridges can be replaced with organic vapor cartridges for the duration of the test.

(a) Odor Threshold Screening. Odor threshold screening, done without wearing a respirator, is to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) You'll need three 1 liter glass jars with metal lids.

(2) Use odor-free water (e.g., distilled or spring water) at approximately 25 degrees C. (77 degrees F.) for the solutions.

(3) Make the isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1-liter jar, closing the lid and shaking for 30 seconds. Make a new solution at least weekly.

(4) Do the screening test in a room separate from the room used for actual fit testing. Ventilate the two rooms to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) Make the odor test solution in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. Shake the solution for 30 seconds and allow it to stand for 2 to 3 minutes so that the IAA concentration above the liquid may reach equilibrium. Use this solution for only 1-day.

(6) Make a test blank in a third jar by adding 500 cc of odor-free water.

(7) Label the odor test and test blank jar lids (e.g., 1 and 2) for jar identification. Place the labels on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(8) Type the following instruction on a card and place it on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also has a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(9) Make the mixtures for the IAA odor detection test in an area separate from where you do the test, in order to prevent olfactory fatigue in the subject.

(10) If the test subject cannot correctly identify the jar containing the odor test solution, do not do the IAA qualitative fit test.

(11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

(1) The fit test chamber must be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, make a similar chamber using plastic sheeting. The inside top center of the chamber must have a small hook attached.

(2) Each respirator for the fitting and fit testing must have organic vapor cartridges or offer protection against organic vapors.

(3) After selecting, donning, and properly adjusting a respirator, the test subject must wear it to the fit testing room. This room must be separate from the room used for odor threshold screening and respirator selection, and must be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(4) Tape a copy of the test exercises and any prepared text from which the subject is to read to the inside of the test chamber.

(5) Give the test subject a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA when they enter the test chamber. Have the test subject hang the wet towel on the hook at the top of the chamber. You may substitute an IAA test swab or ampule for the IAA wetted paper towel if the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow 2 minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of their cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

(7) If at any time during the test, the subject detects the banana-like odor of IAA, the test is a failure. The subject must quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(8) If the test fails, the subject must return to the selection room and remove the respirator. The test subject must repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure in (b)(1) through (7) above. The process continues until they find a respirator that fits right. Should the odor sensitivity test fail, the subject must wait at least a few minutes before re-testing. Odor sensitivity will usually return by this time.

(9) If the subject passes the test, demonstrate the efficiency of the test procedure by having the subject break the respirator face seal and take a breath before exiting the chamber.

(10) When the test subject leaves the chamber, they must remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration build-up in the chamber during subsequent tests. Keep the used towels in a self-sealing plastic bag to prevent contamination of the test area.

(3) Saccharin Solution Aerosol Procedure

You must explain the entire screening and testing procedure to the test subject before starting the screening test.

(a) Taste threshold screening. The saccharin taste threshold screening, done without wearing a respirator, is to determine if the individual being tested can detect the taste of saccharin.

(1) During threshold screening as well as during fit testing, subjects must wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when wearing a respirator. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure must have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) Have the test subject put on the test enclosure. Throughout the threshold screening test, the test subject must breathe through their slightly open mouth with tongue extended. Tell the subject to report when they detect a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor must spray the threshold check solution into the enclosure. Direct the nozzle away from the nose and mouth of the person. Clearly mark this nebulizer to distinguish it from the fit test solution nebulizer.

(5) Make the threshold check solution by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. You can also put 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, firmly squeeze the nebulizer bulb so that it collapses completely, then release and allow to fully expand.

(7) Repeat ten squeezes rapidly and then ask the test subject if they can taste the saccharin. The test is over when the test subject reports tasting the sweet taste during the ten squeezes. Note the taste threshold as ten regardless of the number of squeezes actually done.

(8) If the first response is negative, do ten more squeezes rapidly and ask the test subject if they taste the saccharin. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is over. The taste threshold is twenty regardless of the number of squeezes actually done.

(9) If the second response is negative, do ten more squeezes rapidly and ask the test subject again if they taste the saccharin. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is over. The taste threshold is thirty regardless of the number of squeezes actually done.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the test subject cannot taste saccharin after 30 squeezes they may not perform the saccharin fit test.

Note to paragraph 3.(a): If the test subject eats or drinks something sweet before the screening test, they may be unable to taste the weak saccharin solution.

(12) If the test subject gives a taste response, ask them to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer uses approximately 1 ml of liquid at a time in the nebulizer body.

(14) Thoroughly rinse the nebulizer in water, shake it dry, and refill it at least each morning and afternoon or at least every 4 hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as in 3.(a) above.

(3) The test subject must put on the enclosure while wearing the respirator selected in section I.A.. They must properly adjust the respirator and it must have a particulate filter(s).

(4) Use a second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent to spray the fit test solution into the enclosure. Clearly mark this nebulizer to distinguish it from the screening test solution nebulizer.

(5) Make the fit test solution by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject must breathe through the slightly open mouth with tongue extended, and report if they taste the sweet taste of saccharin.

(7) Insert the nebulizer into the hole in the front of the enclosure and spray an initial concentration of saccharin fit test solution into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. The minimum is 10 squeezes.

(8) After generating the aerosol, tell the test subject to perform the exercises in section I.A.13.

(9) Replenish the aerosol concentration every 30 using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject must indicate to the test conductor if at any time during the fit test they taste saccharin. If the test subject does not report tasting the saccharin, the test is successful.

(11) If they taste the saccharin, the fit is unsatisfactory and a failure. Try a different respirator and repeat the entire test procedure (taste threshold screening and fit testing).

(12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

(4) Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Procedure

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT procedure uses the published saccharin test procedure because that procedure is widely accepted. Bitrex is a taste aversion agent used in household liquids that children should not drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. Explain the entire screening and testing procedure to the test subject before the screening test.

(a) Taste Threshold Screening.

The Bitrex taste threshold screening, done without wearing a respirator, is to determine if the person being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects must wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure must be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure must have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject must put on the test enclosure. Throughout the threshold screening test, the test subject must breathe through his or her slightly open mouth with tongue extended. Tell the subject to report when they detect a bitter taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the spray the Threshold Check Solution into the enclosure. Clearly mark this Nebulizer to distinguish it from the fit test solution nebulizer.

(5) Make the Threshold Check Solution by adding 13.5 milligrams of Bitrex to 100 ml of 5 percent salt (NaCl) solution in distilled water.

(6) To produce the aerosol, firmly squeeze the nebulizer bulb so that the bulb collapses completely, and then release it and allow it to fully expand.

(7) Repeat the initial ten squeezes rapidly and then ask the test subject if they taste the Bitrex. If the test subject tastes the bitter taste during the ten squeezes, the screening test is over. The taste threshold is ten regardless of the number of squeezes actually done.

(8) If the first response is negative, repeat ten more squeezes rapidly and ask the test subject if they taste the Bitrex. If the test subject tastes the bitter taste during the second ten squeezes, the screening test is over. The taste threshold is twenty regardless of the number of squeezes actually done.

(9) If the second response is negative, do ten more squeezes rapidly and ask the test subject if they taste the Bitrex. If the test subject tastes the bitter taste during the third set of ten squeezes, the screening test is over. The taste threshold is as thirty regardless of the number of squeezes actually done.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the subject does not taste the Bitrex after 30 squeezes (step 10), the test subject cannot taste Bitrex and may not do the Bitrex fit test.

(12) If they taste the Bitrex, ask the test subject to remember the taste for reference in the fit test.

(13) Correct use of the nebulizer is approximately 1 ml of liquid at a time in the nebulizer body.

(14) Thoroughly rinse the nebulizer in water, shake to dry, and refill at least each morning and afternoon or at least every 4 hours.

(b) Bitrex Solution Aerosol Fit Test Procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as in 4.(a) above.

(3) The test subject must put on the enclosure while wearing the respirator selected according to section I.A. They must properly adjust the respirator and it must have any type particulate filter(s).

(4) Use a second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent to spray the fit test solution into the enclosure. Clearly mark this nebulizer to distinguish it from the screening test solution nebulizer.

(5) Make the fit test solution by adding 337.5 mg of Bitrex to 200 ml of a 5 percent salt (NaCl) solution in warm water.

(6) As before, the test subject must breathe through his or her slightly open mouth with tongue extended, and report if they taste the bitter taste of Bitrex.

(7) Insert the nebulizer into the hole in the front of the enclosure and spray an initial concentration of the fit test solution into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.

(8) After generating the aerosol, tell the test subject to do the exercises in section I.A.13.

(9) Replenish the aerosol concentration every 30 seconds using one half the number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject must indicate to the test conductor if they taste the Bitrex during the test. If the test subject does not taste the Bitrex, the test passes.

(11) If they taste the Bitrex, the fit is unsatisfactory and the test fails. They must try a different respirator and repeat the entire test procedure (taste threshold screening and fit testing).

(5) Irritant Smoke (Stannic Chloride) Procedure

This qualitative fit test uses a person’s response to the irritating chemicals released in the “smoke” produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions

(1) The test respirator must have high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Use only stannic chloride smoke tubes for this procedure.

(3) Do not use any form of test enclosure or hood for the test subject.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor must take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Use only the smallest amount of smoke necessary to get a response when doing the sensitivity screening checks that determine if the test subject can detect irritant.

(5) Do the fit test in an area with adequate ventilation to prevent exposure of the person doing the fit test or the build-up of irritant smoke in the general area.

(b) Sensitivity Screening Check

The person taking the test must demonstrate their ability to detect a weak concentration of the irritant smoke.

(1) The test operator must break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator must cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(2) The test operator must advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep their eyes closed during the test.

(3) Allow the test subject to smell a weak concentration of the irritant smoke before putting the respirator on to become familiar with its irritating properties and to determine if they can detect the irritating properties of the smoke. Carefully direct a small amount of the irritant smoke in the test subject's direction to determine that they can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person fit tested must put on the respirator without assistance, and do the required user seal check(s).

(2) Tell the test subject to keep their eyes closed.

(3) The test operator must direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator must begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator must gradually make two more passes around the perimeter of the mask, moving to within 6 inches of the respirator.

(4) If the test subject has no involuntary response and/or does not detect the irritant smoke, proceed with the test exercises.

(5) The test subject must do the exercises in section I.A.13. while the respirator seal is continually challenged by the smoke, directed around the perimeter of the respirator at a distance of 6 inches.

(6) If the person detects the irritant smoke, the test fails. The person re-testing must repeat the entire sensitivity check and fit test procedure.

(7) Give a second sensitivity screening check to each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation), with the smoke from the same smoke tube used during the fit test, with the respirator off, to determine if they still reacts to the smoke. Failure to evoke a response voids the fit test.

(8) If there is a response during this second sensitivity check, then the fit test passes.

C. Quantitative Fit Test (QNFT) Procedures

The following quantitative fit testing procedures are acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and using instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a face piece to quantify the respirator fit.

(1) General

(a) The employer must ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer must ensure that QNFT equipment is clean, and maintained and calibrated according to the manufacturer's instructions so as to operate at its design parameters.

(2) Generated Aerosol Quantitative Fit Testing Procedure

(a) Apparatus.

(1) Instrumentation. Use aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols.

(2) Test chamber. The test chamber must be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber must effectively

isolate the test agent from the outside air, yet allow its concentration to be uniform throughout the chamber.

(3) When testing air-purifying respirators, replace the normal filter or cartridge element with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) The sampling instrument must make a computer record or strip chart record of the test showing the rise and fall of the test agent concentration with each inhale and exhale 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 are Ok if they make a record of the readings.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration must not expose the test subject in excess of an established exposure limit for the test agent at any time during the testing process.

(6) The sampling port on the test specimen must not allow leaks around the port (e.g., where the respirator is probed). It must always allow a free airflow into the sampling line, and there must be no interference with the fit or performance of the respirator. The in-mask sampling device (probe) must draw the air sample from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the face piece cavity at least 1/4-inch.

(7) The test setup must permit the person administering the test to observe the test subject inside the chamber during the test.

(8) The equipment generating the test atmosphere must keep the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) must be minimal. There must be a clear association between the occurrence of an event and its recording.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port must be of equal diameter and of the same material. The length of the two lines must be equal.

(11) The exhaust flow from the test chamber must pass through an appropriate filter (i.e., high efficiency particulate filter) before release.

(12) When using sodium chloride aerosol, the relative humidity inside the test chamber must not exceed 50 percent.

(13) Take into account the limitations of instrument when determining the fit factor.

(14) Test respirators must work right. Inspect them regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

(1) When performing the initial user seal check using a positive or negative pressure check, crimp the sampling line closed 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 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.

(3) You must measure a reasonably stable test agent concentration in the test chamber prior to testing. For canopy or shower curtain types of test units, you may determine the test agent's stability after the test subject enters the test environment.

(4) Immediately after the subject enters the test chamber, measure the test agent concentration inside the respirator to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full-face piece respirator.

(5) You must have a stable test agent concentration before starting the test.

(6) Do not tighten the respirator restraining straps too much for testing. The wearer must adjust the straps without assistance to give a reasonably comfortable fit typical of normal use. Do not adjust the after the fit test exercises begin.

(7) Stop the test when any single peak penetration exceeds 5 percent for half masks and 1 percent for full-face piece respirators. The test subject must refit and retest.

(8) Calculation of fit factors.

(i) Determine the fit factor for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) Calculate the average test chamber concentration as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) Use one of these methods to figure the concentration of the challenge agent inside the respirator:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator using a strip chart recorder, integrator, or computer. The agent penetration is the average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart

recordings of the test. The highest peak penetration for a given exercise is representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This equation represents the procedure:

$$\text{Overal Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_7 + 1/ff_8}$$

a. Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) Do not allow the test subject to wear a half mask or quarter face piece respirator unless they have a minimum fit factor of 100, or a full face piece respirator unless they have a minimum fit factor of 500.

(10) Replace filters used for quantitative fit testing when they cause increased breathing resistance, or when the test agent has altered the integrity of the filter media.

(3) Quantitative fit testing (QNFT) procedure for the ambient aerosol condensation nuclei counter (CNC).

Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing procedure.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing ([~~Portacount™~~]**PortaCount®**) procedure quantitatively fit tests respirators with the use of a probe. The probed respirator is only for use with quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and is available from the respirator manufacturer or distributor. The **primary** CNC instrument manufacturer, TSI [~~Inc.~~]**Incorporated**, also provides probe attachments (TSI **mask** sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator **(elastometric or filtering facepiece),** and a minimum fit factor pass level of at least 500 is required for a full-face piece [~~negative pressure~~]**elastometric** respirator. Explain the entire screening and testing procedure to the test subject before doing the screening test.

(a) [~~Portacount~~]**PortaCount®** Fit Test Requirements.

(1) Check the respirator to make sure the sampling probe and line are properly attached to the face piece and that the respirator has a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.

(2) Instruct the test employee to put on the respirator for 5 minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This person must have training on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If it leaks, determine the cause. If the leak is from a poorly fitting face piece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the [~~Portacount~~]**PortaCount®** and proceed with the test.

(6) Instruct the test subject to perform the exercises in section I.A.13.

(7) After the test exercises, question the test subject about the comfort of the respirator. If it has become unacceptable, try another model respirator.

(b) [~~Portacount~~]**PortaCount®** Test Instrument.

(1) The [~~Portacount~~]**PortaCount®** will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

(2) Since the pass or fail criterion of the [~~Portacount~~]**PortaCount®** is user programmable, the test operator must ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) Keep a record of the test, assuming the fit test was successful. The record must have the test subject's name; overall fit factor; make, model, style, and size of respirator; and date of the test.

(4) Modified ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol for full-facepiece and half-mask elastomeric respirators.

(a) When administering this protocol to test subjects, employers shall comply with the requirements specified in Part I.C.3 of this Appendix (ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol), except they shall use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in section I.C.3(a)(6) of this Appendix.

(b) Employers shall ensure that each test subject being fit tested using this protocol follows the exercise and duration procedures, including the order of administration, described in Table A-1 of this Appendix.

Table A-1-- Modified Ambient Aerosol CNC Quantitative Fit Testing Protocol for Full Facepiece and Half-Mask Elastomeric Respirators

Exercises[1]	Exercise procedure	Measurement procedure
Bending Over	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[2].	A 20 second ambient sample, followed by a 30 second mask sample.
Jogging-in-Place	The test subject shall jog in place comfortably for 30 seconds	A 30 second mask sample.
Head Side-to-Side	The test subject shall stand in place, slowly turning his/her head from side to side for 30 seconds and inhale 2 times at each extreme[2].	A 30 second mask sample.
Head Up-and-Down	The test subject shall stand in place, slowly moving his/her head up and down for 39 seconds and inhale 2 times at each extreme[2].	A 30 second mask sample followed by a 9 second ambient sample.

[1]Exercises are listed in the order in which they are to be administered.
[2]It is optional for test subjects to take additional breaths at other times during this exercise.

(5) Modified ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol for filtering facepiece respirators.\

(a) When administering this protocol to test subjects, employers shall comply with the requirements specified in Part I.C.3 of this Appendix (ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol), except they shall use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in section I.C.3(a)(6) of this Appendix.

(b) Employers shall ensure that each test subject being fit tested using this protocol follows the exercise and duration procedures, including the order of administration, described in Table A–2 of this Appendix.

Table A-2-- Modified Ambient Aerosol CNC Quantitative Fit Testing Protocol for Filtering Facepiece Respirators

Exercises[1]	**Exercise procedure**	**Measurement procedure**
Bending Over	**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[2].**	**A 20 second ambient sample, followed by a 30 second mask sample.**
Talking	**The test subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor for 30 seconds. He/she will either read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.**	**A 30 second mask sample.**
Head Side-to-Side	**The test subject shall stand in place, slowly turning his/her head from side to side for 30 seconds and inhale 2 times at each extreme[2].**	**A 30 second mask sample.**
Head Up-and-Down	**The test subject shall stand in place, slowly moving his/her head up and down for 39 seconds and inhale 2 times at each extreme[2].**	**A 30 second mask sample followed by a 9 second ambient sample.**

[1]Exercises are listed in the order in which they are to be administered.
[2]It is optional for test subjects to take additional breaths at other times during this exercise.

[~~(4)~~]**(6)** Controlled negative pressure (CNP) quantitative fit testing procedure.

The CNP procedure is an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator face piece to generate and then maintain a constant negative pressure inside the face piece. The rate of air exhaust is controlled so that there is a constant negative pressure in the respirator during the fit test. The level of pressure is selected to replicate the mean inhalation pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, airflow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage airflow into the respirator. The CNP fit test method measures leak rates through the face piece as a method for determining the face piece fit for negative pressure respirators. The CNP instrument manufacturer Occupational Health Dynamics of Birmingham, Alabama also provides attachments (sampling manifolds) that replace the filter cartridges to

permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds their breath, after which an air pump removes air from the respirator face piece at a pre-selected constant pressure. The face piece fit is expressed as the leak rate through the face piece, in milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full-face piece respirator. Explain the entire screening and testing procedure to the test subject before doing the screening test.

(a) CNP Fit Test Requirements.

(1) The instrument must have a nonadjustable test pressure of 15.0 mm water pressure.

(2) The CNP system defaults selected for test pressure must be set at -15 mm of water (-0.58 inches of water) and the modeled inhalation flow rate must be 53.8 liters per minute for performing fit tests.

(**Note:** CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

(3) The individual who conducts the CNP fit testing must have adequate training to lead the test.

(4) Replace the respirator filter or cartridge with the CNP test manifold. Temporarily remove or prop open the inhalation valve downstream from the manifold.

(5) Train the test subject to hold his or her breath for at least 20 seconds.

(6) The test subject must put on the test respirator without any assistance. The respirator must not be adjusted once the fit-test exercises begin. Any adjustment voids the test, and the test subject must repeat the fit-test.

(7) Follow the QNFT procedure according to section I.C.1. with an exception for the CNP test exercises.

(b) CNP Test Exercises.

(1) Normal breathing. In a normal standing position, without talking, the subject must breathe normally for 1-minute. After the normal breathing exercise, the subject needs to hold their head straight ahead and hold their breath for 10 seconds during the test measurement.

(2) Deep breathing. In a normal standing position, the subject must breathe slowly and deeply for 1-minute, being careful not to hyperventilate. After the deep breathing exercise, the subject must hold their head straight ahead and hold their breath for 10 seconds during test measurement.

(3) Turning head side to side. Standing in place, the subject must slowly turn their head from side to side between the extreme positions on each side for 1-minute. The head must be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold their head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold their head full right and hold his or her breath for 10 seconds during test measurement.

(4) Moving head up and down. Standing in place, the subject must slowly move their head up and down for 1-minute. Instruct the subject to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject must hold their head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject must hold their head full down and hold his or her breath for 10 seconds during test measurement.

(5) Talking. The subject must talk out loud slowly and loud enough to be heard clearly by the test conductor. The subject can read from a prepared text like the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1-minute. After the talking exercise, the subject must hold their head straight ahead and hold their breath for 10 seconds during the test measurement.

(6) Grimace. The test subject must grimace by smiling or frowning for 15 seconds.

(7) Bending Over. The test subject must bend at the waist as if they were to touch their toes for 1-minute. Substitute jogging in place for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject must hold their head straight ahead and hold their breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject must remove and re-don the respirator within a 1-minute period. Then, in a normal standing position, without talking, the subject must breathe normally for 1-minute. After the normal breathing exercise, the subject must hold their head straight ahead and hold their breath for 10 seconds during the test measurement. After the test exercises, question the test about the comfort of the respirator after completion of the test. If it is unacceptable, try another model of respirator.

(c) CNP Test Instrument.

(1) The test instrument must have an effective audio warning device when the test subject fails to hold their breath during the test. Stop the test when the test subject fails to hold their breath. Refit and retest the test subject.

(2) Keep a record of the test, assuming the fit test was successful. The record must have the test subject's name; overall fit factor; make, model, style and size of respirator; and date of the test.

(7) Controlled negative pressure (CNP) REDON quantitative fit testing protocol.

(a) When administering this protocol to test subjects, employers must comply with the requirements specified in paragraphs (a) and (c) of Part I.C.6 of this Appendix ("Controlled negative pressure (CNP) quantitative fit testing protocol"),

as well as use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in paragraph (b) of Part I.C.6 of this Appendix.

(b) Employers must ensure that each test subject being fit tested using this protocol follows the exercise and measurement procedures, including the order of administration, described below in Table A-3 of this Appendix.

Table A-3 - CNP REDON Quantitative Fit Testing Protocol

Exercises[1]	Exercise procedure	Measurement procedure
Facing Forward	Stand and breathe normally, without talking, for 30 seconds.	Face forward, while holding breath for 10 seconds.
Bending Over	Bend at the waist, as if going to touch his or her toes, for 30 seconds.	Face parallel to the floor, while holding breath for 10 seconds
Head Shaking	For about three seconds, shake head back and forth vigorously several times while shouting.	Face forward, while holding breath for 10 seconds.
Redon-1	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask.	Face forward, while holding breath for 10 seconds.
Redon-2	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask again.	Face forward, while holding breath for 10 seconds.

[1]Exercises are listed in the order in which they are to be administered.

(c) After completing the test exercises, the test administrator must question each test subject regarding the comfort of the respirator. When a test subject states that the respirator is unacceptable, the employer must ensure that the test administrator repeats the protocol using another respirator model.

(d) Employers must determine the overall fit factor for each test subject by calculating the harmonic mean of the fit testing exercises as follows:

$$\text{Overall fit factor} = \frac{1}{[1/FF_1 + 1/FF_2 + \ldots 1/FF_N]}$$

Where:

N = The number of exercises;

FF_1 = The fit factor for the first exercise;

FF_2 = The fit factor for the second exercise; and

FF_n = The fit factor for the nth exercise.

Part II. New Fit Test Procedures – Oregon OSHA will accept any new procedures that OSHA accepts. For more information of submitting new procedures for acceptance or other information about this subject, read the federal rules.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 3-2007, f. 8/13/07, ef. 8/13/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.
OR-OSHA Admin. Order 4-2019, f. XX/XX/XX, ef. XX/XX/XX.

Appendix B-1 to OAR 437-004-1041, Respiratory Protection – User Seal Check Procedures (Mandatory)

The user of a tight-fitting respirator must do a seal check every time they put on the respirator. They must use one of the two methods below or the manufacturer's recommended method. (These tests do not substitute for qualitative or quantitative fit tests.)

(I) Face piece Positive and/or Negative Pressure Checks

(A) Positive pressure check. Close off the exhalation valve and exhale gently into the face piece. The face fit is satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(B) Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the face piece remains in its slightly collapsed condition and there is no sign of inward leakage of air, the tightness of the respirator is satisfactory.

(II) Manufacturer's Recommended User Seal Check Procedures

You may use the respirator manufacturer's recommended procedures for performing a user seal check instead of the positive and/or negative pressure check procedures if you can demonstrate that the manufacturer's procedures are equally effective.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.

Appendix B-2 to OAR 437-004-1041, Respiratory Protection – Respirator Cleaning Procedures (Mandatory)

These are general procedures for cleaning respirators. You may also use the manufacturer's recommendations if they meet the objectives of these procedures to prevent harm to the user and/or damage to the respirator.

I. Procedures for Cleaning Respirators

(A) Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

(B) Wash components in warm (43 degrees C. [110 degrees F.] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

(C) Rinse components thoroughly in clean, warm (43 degrees C. [110 degrees F.] maximum), preferably running water. Drain.

(1) When the cleaner does not contain a disinfecting agent, immerse respirator components for 2 minutes in one of the following:

(2) Hypochlorite solution (50 ppm of chlorine) of approximately one-milliliter of laundry bleach and one liter of water at 43 degrees C. (110 degrees F.); or,

(3) Aqueous solution of iodine (50 ppm iodine) of approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45 percent alcohol) to one liter of water at 43 degrees C. (110 degrees F.); or,

(D) Other commercially available cleansers of equivalent disinfectant quality, if the respirator manufacturer recommends their use.

(E) Rinse components thoroughly in clean, warm (43 degrees C. [110 degrees F.] maximum), preferably running water. Drain. Thorough rinsing is extremely important. Detergents or disinfectants that dry on face pieces may cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

(F) Components should be hand-dried with a clean lint-free cloth or air-dried.

(G) Reassemble face piece, replacing filters, cartridges, and canisters where necessary.

(H) Test the respirator to ensure that all components work properly.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 3-2007, f. 8/13/07, ef. 8/13/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.

Appendix C to OAR 437-004-1041, Respiratory Protection

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE (MANDATORY)

EMPLOYEE: Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers. Your employer must tell you how to send or deliver this questionnaire to the health care professional who will review it.

Part A. Section 1. Every employee selected to use any type of respirator must provide the following information (please print).

Date: _____

Name: _____ Job Title: _____

Age: _____ Sex: M / F Height: _____ Weight: _____
Phone #: ( )_____-_____

A phone number where the health care professional can reach you (include the Area Code):
( )_____-_____

The best time to phone you at this number:_____

Has your employer told you how to contact the health care professional who will review this questionnaire (circle one)? Yes / No

Check the type of respirator you will use (you can check more than one category):

a. ____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

b. ____ Other type (for example, half or full-face type, powered-air purifying, supplied-air, self-contained breathing apparatus).

Have you worn a respirator (circle one)? Yes / No

If "yes", what type(s): _____

Part A. Section 2. Every employee selected to use any type of respirator must answer questions 1 through 9 below (please circle "yes" or "no").

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month? Yes / No
2. Have you *ever* had any of the following conditions?
   a. Seizures (fits) Yes / No
   b. Diabetes (sugar disease) Yes / No
   c. Allergic reactions that interfere with your breathing Yes / No
   d. Claustrophobia (fear of closed-in places) Yes / No
   e. Trouble smelling odors Yes / No
3. Have you *ever* had any of the following pulmonary or lung problems?
   a. Asbestosis Yes / No
   b. Silicosis Yes / No
   c. Asthma Yes / No
   d. Pneumothorax (collapsed lung) Yes / No
   e. Chronic bronchitis Yes / No
   f. Lung cancer Yes / No
   g. Emphysema Yes / No
   h. Broken ribs Yes / No
   i. Pneumonia Yes / No
   j. Any chest injuries or surgeries Yes / No
   k. Tuberculosis Yes / No
   l. Any other lung problem that you have been told about Yes / No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?
   a. Shortness of breath Yes / No
   b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline Yes / No
   c. Shortness of breath when walking with other people at an ordinary pace on level ground Yes / No
   d. Have to stop for breath when walking at your own pace on level ground Yes / No
   e. Shortness of breath when washing or dressing yourself Yes / No
   f. Shortness of breath that interferes with your job Yes / No
   g. Coughing that produces phlegm (thick sputum) Yes / No
   h. Coughing that wakes you early in the morning Yes / No
   i. Coughing that occurs mostly when you are lying down Yes / No
   j. Coughing up blood in the last month Yes / No
   k. Wheezing Yes / No
   l. Wheezing that interferes with your job Yes / No
   m. Chest pain when you breath deeply Yes / No
   n. Any other symptoms that you think may be related to lung problems Yes / No

5. Have you *ever* had any of the following cardiovascular or heart problems?
   a. Heart attack Yes / No
   b. Stroke Yes / No
   c. Angina Yes / No
   d. Heart failure Yes / No
   e. Swelling in your legs or feet (not caused by walking) Yes / No
   f. Heart arrhythmia (heart beating irregularly) Yes / No
   g. High blood pressure Yes / No
   h. Any other heart problems that you have been told about Yes / No

6. Have you *ever* had any of the following cardiovascular or heart symptoms?
   a. Frequent pain or tightness in your chest Yes / No
   b. Pain or tightness in your chest during physical activity Yes / No
   c. Pain or tightness in your chest that interferes with your job Yes / No
   d. In the past 2 years, have you noticed your heart skipping or missing a beat Yes / No
   e. Heartburn or indigestion that is not related to eating Yes / No
   f. Any other symptoms that you think may be related to heart or circulation problems Yes / No

7. Do you *currently* take medication for any of the following problems?
   a. Breathing or lung problems Yes / No
   b. Heart trouble Yes / No
   c. Blood pressure Yes / No
   d. Seizures (fits) Yes / No

8. If you have used a respirator, have you *ever* had any of the following problems? (If you have *never* used a respirator continue to question 9)
   a. Eye irritation Yes / No
   b. Skin allergies or rashes Yes / No
   c. Anxiety Yes / No
   d. General weakness or fatigue Yes / No

e. Any other problem that interferes with your use of a respirator Yes / No

9. Would you like to discuss your answers with the health care professional who will review this questionnaire? Yes / No

Employees who will use either a full-face respirator OR a self-contained breathing apparatus (SCBA) MUST answer Questions 10 through 15:

10. Have you ever lost vision in either eye temporarily or permanently? Yes / No

11. Do you *currently* have any of the following vision problems?
    a. Wear contact lenses Yes / No
    b. Wear glasses Yes / No
    c. Color blind Yes / No
    d. Any other eye or vision problem Yes / No

12. Have you *ever* had an injury to your ears, including a broken ear drum? Yes / No

13. Do you *currently* have any of the following hearing problems?
    a. Difficulty hearing Yes / No
    b. Wear a hearing aid Yes / No
    c. Any other hearing or ear problem Yes / No

14. Have you *ever* had a back injury? Yes / No

15. Do you *currently* have any of the following musculoskeletal problems?
    a. Weakness in any of your arms, hands, legs, or feet Yes / No
    b. Back pain Yes / No
    c. Difficulty fully moving your arms and legs Yes / No
    d. Pain or stiffness when you lean forward or backward at the waist Yes / No
    e. Difficulty fully moving your head up or down Yes / No
    f. Difficulty fully moving your head side to side Yes / No
    g. Difficulty bending at your knees Yes / No
    h. Difficulty squatting to the ground Yes / No
    i. Climbing a flight of stairs or a ladder carrying more than 25 pounds Yes / No
    j. Any other muscle or skeletal problem that interferes with using a respirator Yes / No

Part B. Section 1. The health care professional who will review this questionnaire may – at their discretion – add these questions and any other questions pertinent to this evaluation.

1. In your present job are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen? Yes / No

   If "Yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these condition? Yes / No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals? Yes / No

If “Yes,” name the chemicals if you know them:_____
_____

3. Have you ever worked with any of the materials, or under any of the conditions listed below:
   a. Asbestos Yes / No
   b. Coal (for example, mining) Yes / No
   c. Silica (e.g., sandblasting) Yes / No
   d. Iron Yes / No
   e. Tungsten/cobalt (grinding or welding this material) Yes / No
   f. Tin Yes / No
   g. Dusty environments Yes / No
   h. Beryllium Yes / No
   i. Any other hazardous exposures Yes / No
   j. Aluminum Yes / No

   If “Yes,” describe these exposures: _____
   _____

4. List any second jobs or side businesses you have: _____
   _____

5. List your previous occupations: _____
   _____

6. List your current and previous hobbies: _____
   _____

7. Were you ever in the military services? Yes / No

   If “yes” were you exposed to biological or chemical agents (either in training or combat)?Yes / No

8. Have you ever worked on a HAZMAT team? Yes / No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)? Yes / No

   If “Yes,” name the medications if you know them: _____
   _____

NOTES:

Part B. Section 2. The EMPLOYER must provide this supplemental information to the health care professional (PLHCP) who will review the employee’s medical questionnaire:

EMPLOYEE’S NAME: _____

EMPLOYEE'S JOB TITLE/CLASSIFICATION: _____

1. What type of respirator will this employee use?
   Check the type(s) below (you can check more than one category):
   _____ N-, R-, or P- filtering facepiece (disposable, "dust mask" type)
   _____ Tight-fitting, air-purifying half-mask,
   _____ Tight-fitting full-face mask
   _____ Air-purifying type
   _____ Supplied air type

   _____ Powered-air purifying respirator (PAPR)
   _____ Tight-fitting, full face mask
   _____ Loose-fitting helmet or hood
   _____ Self-Contained Breathing Apparatus (SCBA)
   _____ Escape (gas mask)

2. What is the approximate weight of the respirator and any tanks or air hoses?
   _____

3. Will the employee use any of the following items with these respirator(s)?
   a. HEPA filters Yes / No
   b. Canisters (gas masks) Yes / No
   c. Cartridges (air-purifying) Yes / No

4. How often will the employee use the respirator(s)? (circle "yes" or "no" for all answers that apply)
   a. Escape only (no rescue duties) Yes / No
   b. Less than 2 hrs. per day Yes / No
   c. Emergency rescue only Yes / No
   d. 2 to 4 hrs. per day Yes / No
   e. Less than 5 hrs. per week Yes / No
   f. over 4 hrs. per day Yes / No

5. When the employee uses the respirator(s), is their work effort:

   a. Light (less than 200 kcal per hour) Yes / No

   If "yes" how long does this period last during the average shift:
   hrs._____ mins._____

   Examples of light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while controlling machines.

   b. Moderate (200 to 350 kcal per hour): Yes / No

   If "yes" how long does this period last during the average shift:
   hrs._____ mins._____

   Examples of moderate work effort are sitting while nailing or filing: driving a truck, drilling, nailing performing assembly work, or transferring a moderate load (about 35 pounds)

at trunk level; walking on a level surface about 2 mph or down a 5 degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 pounds) on a level surface. (**NOTE:** A gallon of water weighs about 8 lbs; so, a full, 3-gallon, backpack sprayer weights about 25 lbs.)

c. Heavy (above 350 kcal per hour): Yes / No

If "yes" how long does this period last during the average shift?
hrs._____ mins._____

Examples of heavy work are lifting a heavy load (about 50 pounds) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8 degree grade about 2 mph, climbing stairs with a heavy load (about 50 pounds).

6. Will the employee wear protective clothing and/or equipment (other than the respirator) when using their respirator? Yes / No

   If "yes," describe this protective clothing and/or equipment: _____
   _____

7. Will they be working in hot conditions (temperature more than 77 degrees F)? Yes / No

8. Will they be working in humid conditions? Yes / No

9. Describe the work they will be doing while using their respirator(s): _____
   _____

10. Describe any special or hazardous conditions they might encounter when using a respiratory protection (for example, confined spaces, oxygen-deficient atmospheres, life threatening gases): _____
    _____

11. Provide the following information, if you know it, for each toxic substance that they will be exposed to when using their respirator(s):

    Name of the first toxic substance: _____

    Estimated maximum exposure level per shift: _____

    Duration of exposure per shift: _____

    Name of the second toxic substance: _____

    Estimated maximum exposure level per shift: _____

    Duration of exposure per shift: _____

    Name of the third toxic substance: _____

    Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of any other toxic substances that they will be exposed to while using a respirator:

12. Describe any special responsibilities they will have while using their respirator(s) that may affect the safety and well-being of others (i.e., rescue, security): _____
_____

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.

Apéndice C de OAR 437-004-1041, Protección de la Respiración
CUESTIONARIO PARA EVALUACION MEDICA RESPIRATORIA

(OBLIGATORIO)

TRABAJADOR: Su empleador debe permitirle contestar estas preguntas durante horas normales de trabajo o durante un tiempo y lugar que le sea conveniente a usted. Para mantener su confidencialidad, su empleador o supervisor no debe ver o revisar sus respuestas. Su empleador deberá decirle como enviar o entregar este cuestionario al profesional de cuidado de la salud que lo revisará.

Parte A. Sección 1.

Cada trabajador elegido para usar cualquier tipo de respirador debe proporcionar la siguiente información (use letra de molde).

Fecha: _____

Nombre: _____ Ocupación, título o tipo de trabajo:_____ _____

Edad: _____ Género: M / F Estatura: _____ Peso: _____

Número de Teléfono: (___)____-_____

Dé un número de teléfono donde el profesional de salud que revisará este cuestionario pueda comunicarse con usted (incluya el Código de Área)
La mejor hora de hablarle ha este teléfono: _____

¿Su patrón le explicó como comunicarse con el profesional de salud que revisará este cuestionario? (circule uno) Sí / No

Marque el tipo de respirador que usará (puede marcar más de una categoría):

a. ____ N, R, o P respirador desechable (máscara de filtro solamente sin cartucho).
b. ____ Otro tipo (por ejemplo, máscara de media cara o cara completa, purificadores motorizados, de suministro de aire, equipo autónomo de respiración).

¿Ha usado usted un respirador antes? (circule uno) Sí / No

Si “afirmativo”, ¿que tipo(s)?:

_____

Parte A. Sección 2

Cualquier trabajador elegido ha usar cualquier tipo de respirador debe contestar las preguntas del 1 al 9 (circule sí o no).

1. ¿En la *actualidad*, fuma tabaco, o ha fumado tabaco en el último mes? Si / No

2. ¿Ha padecido usted de lo siguiente?

   a. Convulsiones Si / No
   b. Diabetes (azúcar en la sangre) Si / No
   c. Reacciones alérgicas que interfieren con su respiración Si / No
   d. Claustrofobia (temor a espacios cerrados) Si / No
   e. Problemas del olfato Si / No

3. ¿Ha padecido en *cualquier tiempo* usted de los siguientes problemas pulmonares?

   a. Asbestosis Si / No
   b. Silicosis Si / No
   c. Asma Si / No
   d. Neumotorax (desinfle del pulmón) Si / No
   e. Bronquitis crónica Si / No
   f. Cáncer del pulmón Si / No
   g. Enfisema Si / No
   h. Fracturas de las costillas Si / No
   i. Neumonía Si / No
   j. Cualquier lesión o cirugía del pecho Si / No
   k. Tuberculosis Si / No
   l. Cualquier otro problema del pulmón del cual se le ha informado Si / No

4. ¿*Actualmente* tiene usted alguno de los siguientes síntomas pulmonares o enfermedades del pulmón?

   a. Falta de aire Si / No
   b. Falta de aire cuando camina rápido sobre una superficie plana o una cuesta leve o una inclinación Si / No
   c. Falta de aire cuando camina con otras personas a un ritmo normal sobre una superficie plana Si / No
   d. Tener que detenerse a coger aire cuando camina a su propio paso sobre superficie plana Sí / No
   e. Falta de aire cuando usted se lava o se viste Sí / No
   f. Falta de aire que interfiere con su trabajo Sí / No
   g. Tos que produce flema espesa Sí / No
   h. Tos que lo despierta temprano por la mañana Sí / No

i. Tos que se pasa más cuando esta acostado Sí / No
j. Tos con sangre (durante el ultimo mes) Sí / No
k. Respiración jadeante Sí / No
l. Respiración jadeante, que interfiere con su trabajo Sí / No
m. Dolor en el pecho cuando respira profundamente Sí / No
n. Cualquier otro síntoma que usted cree que puede estar relacionado con problemas del pulmón Sí / No

5. ¿Ha padecido en *cualquier tiempo* alguno de los siguientes problemas cardiovasculares o del corazón?

a. Ataque al corazón Sí / No
b. Derrame cerebral o Embolia Sí / No
c. Angina Sí / No
d. Falla del corazón Sí / No
e. Hinchazón de las piernas o pies (no causado por el andar) Sí / No
f. Arritmias del corazón (palpitación irregular) Sí / No
g. Presión alta de la sangre Sí / No
h. Otros problemas del corazón del cual se le ha informado Sí / No

6. ¿Ha padecido *cualquier tiempo* los siguientes síntomas cardiovasculares o del corazón?

a. Dolor o presión frecuente del pecho Sí / No
b. Dolor o presión en el pecho durante actividad física Sí / No
c. Dolor o presión en el pecho que interfiere con su trabajo Sí / No
d. En los últimos dos años ha notado que le salta o le falta un latido al corazón Sí / No
e. Agrura o indigestión, no ocasionada por la comida Sí / No
f. Otros síntomas los cuales usted cree están relacionados a problemas del corazón o la circulación Sí / No

7. ¿ *Actualmente* toma usted medicamentos para algunos de los siguientes problemas?

a. Problemas de la respiración o de los pulmones Sí / No
b. Problemas del corazón Sí / No
c. Presión Sí / No
d. Convulsiones Sí / No

8. *Si usted ha usado* un respirador, ¿ha tenido en alguna ocasión alguno de los siguientes problemas? (Si nunca ha usado un respirador por favor salte a la pregunta 9).

9. Quiere hablar de sus respuestas con el profesional de salud que revisará su cuestionario? Sí / No\

Trabajadores que usarán *un respirador de cara completa O Equipo Autónomo de Respiración (SCBA)* DEBERÁN contestar las preguntas

del 10 al 15:

10. ¿Ha perdido la visión temporalmente o permanentemente en uno o ambos ojos? Sí / No

11. ¿*Actualmente* tiene alguno de los siguientes problemas de la vista?

a. Usa lentes de contacto Sí / No
b. Usa anteojos Sí / No
c. Dificultad para distinguir los colores Sí / No
d. Otros problemas con los ojos o la visón Sí / No

12. ¿Ha tenido *cualquier tiempo* una lesión en los oídos, incluyendo daño al tímpano? Si / No

13. ¿ *Actualmente* tiene alguno de los siguientes problemas con los oídos?

a. Dificultad al oír Sí / No
b. Usa prótesis en el oído Sí / No
c. Cualquier otro problema con la audición o el oído Sí / No

14. ¿ Se ha lesionado la espalda? Si / No

15. ¿ Actualmente tiene alguno de los siguientes problemas músculo esqueléticos?

a. Debilidad en cualquiera de los brazos, manos, piernas, o pies Sí / No
b. Dolor de la espalda Sí / No
c. Dificultad para mover completamente los brazos y piernas Sí / No
d. Dolor o entumecimiento al inclinarse hacia delante o atrás desde la cintura Sí / No
e. Dificultad en mover la cabeza completamente hacia arriba o abajo Sí / No
f. Dificultad en mover la cabeza completamente de un lado a otro Sí / No
g. Dificultad en doblar las rodillas Sí / No
h. Dificultad en ponerse de cuclillas Sí / No
i. Subiendo escalones o una escalera cargando más de 25 libras Sí / No
j. Cualquier otro problema del esqueleto o de los músculos que pueda interferir con usar un respirador Sí / No

Parte B. Sección 1

El profesional de la salud que revisará este cuestionario puede añadir a su discreción las siguientes preguntas y cualquier otra pregunta no listada.

1. ¿En su presente trabajo, trabaja en alturas elevadas (a más de 5,000 pies) o en lugares con niveles de oxigeno más bajas de lo normal? Sí / No

¿*Si "afirmativo"*, tiene mareos, falta de aire, presión en el pecho, u otros síntomas cuando está trabajando bajo estas condiciones? Sí / No

2. ¿En el trabajo o su casa, ha sido usted expuesto a solventes peligrosos, químicos peligrosos transportados por el aire, (gases, humos, o polvos), o haentrado su piel en contacto con químicos peligrosos? Si / No

Si es afirmativo, nombre del (los) químico(s): _____

_____

3. ¿Ha trabajado usted con los siguientes materiales, o bajo alguna de las siguientes condiciones?

a. Asbesto Sí / No
b. Carbón (por ejemplo, en minas) Sí / No
c. Sílice (por ejemplo con chorro de arena) Sí / No
d. Hierro Sí / No
e. Tungsteno/cobalto (limando o soldando este material) Sí / No
f. Estaño Sí / No
g. Ambientes polvorosos Sí / No
h. Berilio Sí / No
i. Cualquier otras exposiciones peligrosas Sí / No
j. Aluminio Sí / No

Si es afirmativo, describa la(s) exposición(es): _____

_____

4. Liste segundos trabajos o negocios paralelos que usted tiene:_____

_____

5. Liste sus ocupaciones anteriores: _____

_____

6. Liste pasatiempos presentes y pasados:_____

_____

7. ¿Estuvo en el servicio militar? Si / No

Si "afirmativo", ¿estuvo expuesto a agentes biológicos o químicos (durante entrenamiento o combate)? Si / No

8. ¿ Ha trabajado en un equipo de limpieza de materiales peligrosos (HAZMAT)? Si / No

9. ¿Fuera de medicinas para la respiración, los pulmones, problemas del corazón, presión, y convulsiones mencionadas anteriormente en este cuestionario, está usted tomando otras medicinas por cualquier razón (incluyendo medicinas sin receta médica)? Sí / No

Si "afirmativo", nombre las medicinas: _____

_____

APUNTES:
Parte B. Sección 2.

El EMPLEADOR deberá proporcionar esta información suplementaria al profesional de cuidado de la salud (PLHCP) que revisará el cuestionario médico del trabajador:

NOMBRE DEL TRABAJADOR: _____

POSICIÓN DEL TRABAJADOR:

_____

1. ¿Qué tipo de respirador usará este trabajador?

Marque el (los) tipo(s) que siguen (puede marcar más de una categoría):

_____ N-, R-, o P- máscara filtrante (desechable, tipo "máscara de polvo").
_____ De ajuste apretado de purificación de media cara
_____ De ajuste apretado de cara completa
_____ De tipo de purificación de aire
_____ De tipo de línea

_____ Respirador purificador de aire motorizado (PAPR)
  _____ De ajuste apretado, de cara completa
  _____ De ajuste apretado de casco o capucha
_____ Equipo Autónomo de Respiración (SCBA)
_____ Escape (máscara de gas)

2. ¿Cuál es el peso aproximado del respirador, y cualquier tanque o mangueras?

_____

3. ¿El trabajador va a utilizar alguno de los siguientes artículos con su(s) respirador(es)?

   a. Filtros HEPA Sí / No
   b. Cánisters (máscaras para gas) Sí / No
   c. Cartuchos (purificación de aire) Sí / No

4 ¿Con que frecuencia usará el trabajador el respirador? (circule sí o no a toda las preguntas que apliquen)

a. Solamente para escape (sin deberes de rescate) Sí / No
b. Menos de 2 horas por día Sí / No
c. Rescate de emergencia solamente Sí / No
d. 2 a 4 horas por día Sí / No
e. Menos de 5 horas por semana Sí / No
f. Más de 4 horas por día Sí / No

5. ¿Durante el período que el trabajador usa el respirador, el esfuerzo de trabajo es?

a. Liviano (menos de 200 Kcal por hora) Sí / No

Ejemplos de trabajo liviano es estar sentado al escribir, computación, haciendo planos, o realizando ensamble ligero, o de pie operando máquinas.
Si "afirmativo", cuanto tiempo dura esto en un turno promedio:
horas _____ minutos _____

b. Moderado (200 a 350 Kcal por hora) Sí / No

Ejemplos de trabajo moderado son: estar sentado martillando o limando, manejado un camión, perforando, o ensamble, moviendo cargas moderadas (aproximadamente 25 – 35 libras) a nivel de la cintura caminando en superficie planas a 2 millas por hora o bajando un nivel de terreno de 5 grados a 3 millas por hora, o empujando una carretilla con carga pesada (aproximadamente 100 libras) en superficie plana. (NOTA: Un galón de agua peso aproximadamente 8 libras, o sea, un rociadora de mochila llena con 3 galones pesa aproximadamente 25 libras.)

Si "afirmativo", cuanto tiempo dura esto en un turno promedio:
horas _____ minutos _____

c. Pesado (más de 350 Kcal por hora) Sí / No

Ejemplos de trabajo pesado son: levantar cargas pesadas(aproximadamente 50 libras) del suelo a la altura de la cintura u hombros, trabajando en un plataformas de carga, trabajo con pala, albañilería de pie, desbarbando piezas de fundición, subiendo niveles de terreno de 8 grados aproximadamente a 2 millas por hora, subiendo escalones con cargas pesadas (aproximadamente 50 libras)

Si "afirmativo", cuanto tiempo dura esto en un turno promedio:
horas _____ minutos _____

6. ¿El trabajador va a utilizar ropa o equipo protector aparte del respirador? Sí / No

Si "afirmativo" describa el equipo que va a usar:

_____
_____

7. ¿El trabajador va a trabajar en temperaturas altas (temperaturas más de 77 F)? Sí / No

8. ¿El trabajador va a trabajar en condiciones húmedas? Sí / No

9. Describa el trabajo que hará el trabajador mientras usa su respirador(es):

_____

_____

10. Describa algunas condiciones especiales o condiciones peligrosas las cuales el trabajador puede enfrentar cuando usa el respirador (por ejemplo, espacios confinados, atmósferas deficientes en oxígeno, gases fulminantes):

_____

_____

11. Proporcione la siguiente información si lo sabe, para cada substancia tóxica a que el trabajador puede ser expuesto cuando usa el respirador(es):

Nombre de la primera substancia tóxica:_____
Nivel máximo de exposición por turno de trabajo:_____
Tiempo de exposición por turno de trabajo:_____

Nombre de la segunda substancia tóxica:_____
Nivel máximo de exposición por turno de trabajo:_____
Tiempo de exposición por turno de trabajo:_____

Nombre de la tercera substancia tóxica: _____
Nivel máximo de exposición por turno de trabajo:_____
Tiempo de exposición por turno de trabajo:_____

Nombre(s) de cualquier otra substancia(s) tóxica(s) a la cual el trabajador pueda ser expuesto mientras usa un respirador:

_____

_____

12. Describa otras responsabilidades especiales que tendrán durante el tiempo que estarán usando respiradores y que puedan afectar la seguridad y bienestar de otras personas (por ejemplo, rescate, seguridad):

_____

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.

Appendix D to OAR 437-004-1041 – Information for Employees Voluntarily Using Respirators (Mandatory)

Respirators are an effective method of protection against designated hazards when properly selected and worn. Oregon OSHA encourages respirator use, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if you improperly use a respirator or do not keep it clean, the respirator itself can

become a hazard. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by Oregon OSHA standards. If your employer provides respirators for your voluntary use, of if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and follow all instructions from the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres with contaminants that it is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.

Apéndice D to OAR 437-004-1041 – Información para Trabajadores que Usan Respiradores Voluntariamente (Obligatorio)

Los respiradores que son seleccionados y usados correctamente son un método de protección efectivo contra peligros designados. Oregon OSHA promueve el uso de respiradotes, aunque la exposición sea menor al límite permitido de exposición, para proveer un mejor nivel de comodidad y protección a los trabajadores. Sin embargo, si usted usa su respirador de manera incorrecta o si la limpieza adecuada no es mantenida, el respirador mismo podría convertirse en un peligro. Los trabajadores pueden usar los respiradores para evitar la exposición a peligros aunque la cantidad de substancias peligrosas no exceda los límites establecidos bajo las reglas de Oregon OSHA. Si su empleador provee respiradores para uso voluntario, o si usted provee su propio respirador, necesita tomar ciertas precauciones para asegurarse de que el respirador no presenta ningún peligro.

Usted debería hacer lo siguiente:

1. Lea y siga todas las instrucciones del fabricante acerca del uso, mantenimiento, limpieza y cuidado. También siga las instrucciones acerca de las advertencias en cuanto a las limitaciones del respirador.

1. Elija respiradores que sean certificados para ser usados en la clase de atmósfera contaminada, específica a su situación El Instituto Nacional para Salud y Seguridad Ocupacional del Departamento de Salud y Servicios Humanos (NIOSH por sus siglas en inglés) certifica respiradores. Una certificación o declaración que debe aparecer en el respirador o paquete del respirador le dirá para qué clase de uso el respirador está diseñado y la capacidad de protección que éste ofrece.

2. No use su respirador en atmósferas que contengan contaminantes si éste no esta diseñado para protegerlo en esos ambientes. Por ejemplo, un respirador que esta diseñado para filtrar partículas de polvo, no lo protegerá contra gases, vapores o partículas sólidas muy pequeñas de humo.

3. Marque su respirador claramente para que por error usted no use el respirador de otra persona.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 3-2006, f. 6/7/06, ef. 3/1/07.
OR-OSHA Admin. Order 4-2012, f. 9/19/12, ef. 1/1/13.