Central Washington University

Respiratory Protection Program

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Table of Contents

1.0 Introduction

The purpose of this program is to ensure the protection of all Central Washington University employees from respiratory hazards through the proper use of respirators. Respirators are to be used only when engineering controls (e.g., enclosure or confinement of the operation, ventilation or substitution of less toxic materials) are not feasible, while engineering controls are being installed or repaired, or in emergencies. All requirements of this document shall be met while respirators are in use.

2.0 Responsibilities

2.1 Central Washington University

Central Washington University (CWU) shall provide the proper respirators when such equipment is necessary to protect the health and safety of the employee. The University shall be responsible for the established of a respiratory protection program in accordance with the State of Washington Department of Labor and Industries (WAC 296-62-071).

2.2 The Environmental Health & Safety Department

The Environmental Health & Safety (EH&S) Department is responsible for the development, documentation, and administration of the CWU Respiratory Protection Program. EH&S shall:

2.2.1 Develop a written respiratory protection program.

2.2.2 Evaluate respiratory hazards in the work environment.

2.2.3 Provide guidance to campus departments for the selection and purchase of approved respirators.

2.2.4 Provide instruction to campus departments on the proper use, maintenance, and storage of respirator equipment.

2.2.5 Provide a fit testing program for respirator wearers.

2.2.6 Maintain fit testing and training records.

2.2.7 Evaluate the overall effectiveness of the respiratory protection program.

2.3 Department Supervisors

Supervisors shall:

2.3.1 Identify and report job areas that require or may require respiratory protective equipment.

2.3.2 Identify and report the personnel under their supervision required to wear respirators.

2.3.3 Ensure the availability of appropriate respirators.

2.3.4 Provide Supervisors on the proper cleaning, inspection, and storage of respirators.

2.3.5 Conduct work site inspections to review compliance with the respiratory protection program.

2.4. Respiratory Wearers

Respirator wearers shall:

2.4.1 Complete the required medical questionnaire. See **Appendix A** to see a copy of CWU's Medical Questionnaire form.

2.4.2 Notify Supervisor of the need to fill out a new medical questionnaire if there has been a change in health since the last fit test.

2.4.3 Inform their Supervisor of any significant weight change, or physical changes of the facial area that would affect the fit of a respirator.

2.4.4 Inform their Supervisor or EH&S of any respiratory hazards that they feel are not adequately addressed.

2.4.5 Use respirators in accordance with instructions and training received from Supervisors and EH&S.

2.4.6 Store, clean, maintain, and guard against damage to respiratory equipment.

2.4.7 Report any deficiencies or malfunctions of a respirator to a Supervisor or EH&S.

3.0 Respiratory Protective Equipment

The purpose of any respirator is to protect the respiratory system from inhalation of hazardous agents. Respirators provide protection either by removing contaminants from the air before it is inhaled or by supplying an independent source of air.

3.1 Air-Purifying Respirators

Ambient air is passed through a filter, cartridge, or canister to remove contaminants prior to be inhaled. Different filters are required to remove different contaminants.

3.1.1 **Dust Mask:** A single-use filtering face-piece generally approved only for nuisance dust. These should be discarded when resistance to breathing become excessive. Dust masks shall not be required for use and will only be provided for voluntary use for nuisance dust.

3.1.2 **Half-Face and Full-Face Respirators:** Provide greater protection than the dust mask because their design allows for a better fit. These respirators provide protection against dusts, mists, fumes, vapors, gases, or any combination of these contaminants depending on the type of filter used. The full facepiece respirator provides the greatest degree of protection and protects the eyes as well.

3.2 Powered Air-Purifying Respirators

3.2.1 **Powered Air-Purifying Respirators:** Contain a portable blower which pushes ambient air through a filter and then supplies purified air to the wearer. The powered type is equipped with a tight-fitting facepiece or a loose-fitting helmet, hood, or suit.

3.3 Atmosphere-Supplying Respirators

Atmosphere-supplying respirators provide a greater level of protection than air-purifying respirators because they don't rely on a filtering mechanism to provide clean air.

3.3.1 **Self-Contained Breathing Apparatus:** A supply of breathing air is carried to the wearer through a gas cylinder attached to a harness on the wear's back.

3.3.2 **Air-Line Respirator:** Respirable air is supplied through a small diameter hose from a compressor or compressed air cylinder.

3.3.3 **Breathing Air Quality:** Compressed air used for respiration shall be of high purity and shall meet the requirements of Grade D breathing air by the Compressed Gas Association (CGA).

4.0 Respirator Program Requirements

4.1 Medical Certification

All CWU employees required to wear respirators will fill out a confidential medical questionnaire that will be sent directly to a Physician or other Licensed Health care Professional (PLHCP) for evaluation. The PLHCP will determine if the employee is approved to wear a respirator or if further evaluation is needed. No CWU employee will be allowed to wear a respirator without being certified by the PLHCP to do so.

4.2 Respirator Selection

4.2.1 Choosing correct respiratory protection equipment involves several steps:

- Determination of the hazard
- Choosing equipment that is certified for the job
- Assuring the devise is performing the function it is intended to do

4.2.2 All respiratory protection devices must be approved by the National Institute for Occupational Safety and Health (NIOSH) for the contaminant or situation to which employees may be exposed.

4.2.3 The Washington Industrial Safety and Health Act states specific standards to be used with asbestos. If you are planning to work with asbestos, please contact EH&S before beginning work.

4.2.4 Identify and evaluate the respiratory hazards in the workplace by reading the Material Safety Data Sheet (MSDS) or the Safety Data Sheet (SDS) for the product that you will be working with. Check to be sure that the proper cartridge filter is being used for the work to be performed.

4.2.5 Respirators shall be selected according to the above instructions and the following Table 1: *Respiratory Protection Selection*.

Table 1 Respiratory Protection Selection		
Hazard	**Respirator**	
Oxygen Deficiency (less than 19.5%)	SCBA or Supplied-Air Respirator with auxiliary escape air supply	
Gas and Vapor Concentration	IDLH	SCBA or Supplied-Air Respirator with auxiliary escape air supply
	Non-IDLH	Air-Purifying Respirator with appropriate cartridge
Particulate Contamination	Half-Face Air-Purifying Respirator with particulate filters; Powered Air-Purifying Respirator with HEPA filters	
Gaseous & Particulate Contaminants	IDLH	SCBA or Supplied-Air Respirator with auxiliary escape air supply
	Non-IDLH	Air-Purifying Respirator with appropriate cartridge
Escape from IDLA Atmospheres	SCBA	

5.0 Training

5.1 Each wearer shall be given initial training by EH&S covering the following topics:

- Respiratory hazards and health effects
- How respirators work
- Engineering controls and respirator use
- Medical evaluation
- Respiratory selection
- Fit-testing
- Respirator donning and fit checks
- Maintenance, cleaning, and storing of respirators

6.0 Respirator Fit-Testing

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit. No CWU employee will be allowed to wear a respirator without being successfully fit tested. Fit tests expire annually. If there are any physical changes that may affect the fit of a respirator such as weight loss or surgery, a new fit test will need to be performed prior to wearing a respirator. If an employee has had a change in

health since the last fit test, the employee must fill out a new medical questionnaire and mail it to the PLHCP for evaluation before performing work in a respirator.

6.1 Qualitative Fit Tests

The worker is exposed to an atmosphere containing an odorant or sweet liquid and then asked to breathe deeply, move head side to side, move head up and down, and talk. The wearer reports any noticeable odor or sense of taste. See **Appendix D** for details on general fit-testing procedures.

6.1.1 **Banana Oil (isoamyl acetate):** This chemical is a pleasant, easily detectible odor, which is used to check the facepiece seal when organic vapor cartridges are used. If the user detects any odor, it is an indication that the fit is faulty.

6.1.2 **Saccharin:** This chemical has a sweet, easily detectable taste. If the user detects any sweet taste in the mouth, it is an indication that the fit is faulty.

6.1.3 **Bitrex:** This chemical has a bitter, easily detectable taste. If the user detects any bitter taste in the mouth, it is an indication that the fit is faulty.

6.1.4 **Irritant Smoke:** This test involves exposing the wear to an irritating aerosol produced by a smoke tube. If the user detects any irritant smoke (i.e., coughing), it is an indication that the fit is faulty.

6.2 Field Fit Checks

After successfully completing an initial EH&S fit test, employees should check the fit of their respirators immediately before and during respirator use in the field.

6.2.1 Positive Pressure Check

Cover the exhalation valve with your hand and exhale gently into the facepiece. If a slight positive pressure is built up inside the facepiece without any evidence of leakage, the fit is satisfactory.

6.2.2 Negative Pressure Check

Cover the cartridges with your hands, inhale gently to collapse the facepiece slightly, hold your breath for 10 seconds. If the facepiece remains slightly collapsed and no leakage is detected, the respirator fits properly.

6.3 Considerations for Proper Fit

6.3.1 Facial Hair

A person who has hair (stubble, moustache, sideburns, beard, low hairline or bangs) which passes between the face and the sealing surface of a tight-fitting facepiece shall not be permitted to wear a respirator.

6.3.2 Glasses and Eye/Face Protective Devices

If a spectacle, goggle, faceshield or welding helmet must be worn with a respirator, it shall be worn so as not to adversely affect the respirator seal. A spectacle, which has temple bars, or straps which pass between the sealing surface of a respirator facepiece and the wear's face shall not be used. If a full-facepiece respirator is used, special prescription glasses are available if needed.

7.0 Issuance and Assignment of Respirators

7.1 Respiratory equipment shall not be ordered, purchased, or issued to personnel unless the respirator wearer has received respirator training and a current fit test. Fit test and training expires annually.

8.0 Respirator Cleaning and Maintenance

Respirators should be regularly cleaned and disinfected. Respirators issued for the exclusive use of one worker may be cleaned as often as necessary. Weekly or monthly cleaning is usually adequate but more frequent cleaning may be necessary. Shared respirators or emergency use respirators must be cleaned and disinfected after each use.

8.1 Cleaning and Disinfecting

8.1.1 Remove any filters or cartridges. Filters and cartridges should not be washed. Discard any filters which are clogged or cartridges that are spent. Disassemble valves and other reusable facepiece parts.

8.1.2 Wash the facepiece and associated parts with mild detergent and warm water. Liquid dishwashing detergent works well. Do not use organic solvents.

8.1.3 Rinse the respirator facepiece and parts in clean warm water.

8.1.4 Prepare a disinfectant solution to kill germs. Two (2) Tablespoons of bleach per gallon of water is a suitable disinfectant. Disinfectant wipes can also be used as a disinfectant.

8.1.5 Immerse the facepiece and parts in the disinfectant solution for two minutes. Rinse with clean warm water and air dry overnight.

8.1.6 After drying, reassemble the respirator and place the facepiece in a sealable plastic bag or other airtight container. Zip-lock baggies work well as storage containers.

8.2 Storage

8.2.1 When not in use, the respirator and cartridges should be kept in a sealed container and stored in a clean, dry, moderate temperature. It is especially important to keep gas and vapor cartridges in a sealed container so they do not passively absorb gases and vapors from the storage area and thereby reduce the filter service life. Particulate filters should also be protected from dusts and dirt. Emergency use respirators should be stored in a sturdy compartment that is quickly accessible and clearly marked.

8.3 Inspection Procedures and Schedules

Each respirator shall be inspected routinely before and after use. Respirators shall be inspected by the user immediately prior to each use to ensure that it is in proper working condition. After cleaning, each respirator shall be inspected to determine it is in proper working condition and if it needs replacement parts or repairs. Each respirator stored for emergency or rescue use shall be inspected at least monthly.

8.3.1 Inspection Checklist for Air-Purifying Respirators

- **Facepiece**
  - Dirt
  - Crack, tears, or holes
  - Distortion of facepiece
  - Cracked, scratched, or loose fitting lenses
- **Head Straps**
  - Breaks or tears
  - Loss of elasticity
  - Broken buckles or attachments
  - Worn serrations on head harness which might allow facepiece to slip
- **Inhalation and Exhalation Valves**
  - Dust particles, dirt, or detergent residue on valve and valve seat
  - Cracks, tears, or distortion in valve material
  - Missing or defective valve covers
- **Filter or Cartridge Elements**
  - Proper filter/cartridge for the hazard
  - Approval designation
  - Missing or worn gaskets
  - Worn threads on filter and facepiece
  - Cracks or dents in filter housing
  - Deterioration of gas mask canister harness
  - Service life indicator, or end of service date
- **Breathing Tube**
  - Cracks or holes
  - Missing or loose hose clamps
  - Broken or missing end connectors

8.3.2 Inspection Checklist for Atmosphere-Supplying Respirators

- Hood, Helmet, Blouse, or Full Suit
  - Rips or torn seams
  - Head gear suspension
  - Cracks or breaks in faceshield
  - Protective screens that are intact and fit correctly over faceshields, hoods, or blouses
- **Air Supply Systems**
  - Breathing air quality
  - Breaks or kinks in an supply hoses and fittings
  - Tightness of regulators and valves

- Correct operations of air-purifying elements and alarm for carbon monoxide or high temperatures

9.0 Special Problems

9.1 Vision

When a respirator user must wear corrective lenses, a protective spectacle, or goggle, a face shield, welding helmet, or other eye and face device, the item shall be fitted to provide good vision and shall be worn in such a manner as not to interfere with the seal of the respirator.

9.2 Immediately Dangerous to Life and Health (IDLH) Atmospheres

An IDLH atmosphere is one that is oxygen deficient or contains excessive concentrations of a contaminant. Under no circumstances should air-purifying respirators be used in an IDLH atmosphere. When respirators are required for entry into IDLH atmospheres, at least one standby person shall be present in a safe area. The standby person shall have the proper rescue communication equipment available to assist the respirator wearer in case of emergency. Communications (visual, voice, signal, telephone, radio, or other suitable means) shall be maintained between the standby person and the respirator wearer. Respirator wearers in IDLH atmospheres shall be equipped with a safety harness and a safety line to permit emergency retrieval.

9.3 Confined Spaces

All confined spaces are to be considered IDLH atmospheres until proven otherwise. Before a person is allowed to enter a confined space, the area will be monitored to determine the concentration of any toxic substance, the presence of explosive gases, and the oxygen levels within the space.

10.0 Respirator Use

10.1 Procedures for Using Respirators

10.1.1 Always perform a positive and negative fit check before starting work with a respirator.

10.1.2 If at any time there is a problem with the respirator, exit the hazardous area before removing mask.

10.1.3 If it becomes difficult to breathe or you begin to detect an odor, exit the hazardous area and change the filter cartridge before returning to the hazardous area. If problems persist, notify the Supervisor of EH&S.

10.1.4 If you feel ill at any time while wearing a respirator, leave the hazardous area, then remove the respirator and notify the Supervisor immediately.

11.0 Classification and Description of Respirators by Mode of Operation

11.1 Supplied-Air Respirators

11.1.1 Self-Contained Breathing Apparatus (SCBA)

A supply of air, oxygen, or oxygen-generating material is carried by the wearer. Normally equipped with a full facepiece, but may be equipped with a quarter-mask facepiece, half-mask facepiece, helmet, hood, or mouthpiece and nose clamp.

11.1.2 Air-Line Respirator

Air is supplied through a small-diameter hose from a compressor or compressed air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached rapidly in an emergency. A flow-control valve or orifice is provided to govern the rate of airflow to the wearer. Exhaled air passes to the ambient atmosphere through a valve(s) or opening(s) in the enclosure (facepiece, helmet, hood, or suit). Up to 300 feet of hose length is permissible.

11.1.3 Combination Air-Line Respirator with Auxiliary Self-Contained Air Supply

This combination is used to provide an escape from a hazardous atmosphere in the event that the primary air supply fails to operate. The wearer switched to the auxiliary self-contained air supply. Devices approved for both entry into and escape from dangerous atmospheres has a low-pressure warning alarm and contain at least 15-minute self-contained air supply.

11.2 Air-Purifying Respirators

Ambient air is passed through a filter, cartridge, or canister which removes particles, vapors, gases or a combination of these contaminants before it is breathed.

11.2.1 Vapor and Gas-Removing Respirators

These respirators are equipped with a cartridge or canister to remove a single vapor (for example: chlorine gas), a single class of vapors (for example: organic vapors or acid gases) from the air that is breathed.

11.2.2 Particulate-Removing Respirators

These respirators are equipped with filters to remove a single type of particulate matter (for example: dust) or a combination of two or more types of particulate matter (for example: dust and fume) from air. The filter may be a replaceable part or a permanent part of the respirator. The filter may be single-use or reusable.

11.2.3 Combination Particulate / Vapor and Gas-Removing Respirators

These respirators are equipped with a cartridge or canister to remove particulate matter, vapors, and gasses from air. The filter may be a permanent part or a replaceable part of a cartridge or canister.

12.0 Capabilities and Limitations of Respirators

12.1 Atmosphere-Supplying Respirators

Atmosphere-supplying respirators provide protection against oxygen deficient and toxic atmospheres.

12.1.1 Self-Contained Breathing Apparatus (SCBA)

The wearer carries a cylinder of air or oxygen on his/her back.

Limitations: The length of time that the device will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure, and the type of work being performed. Some SCBA devices have a short service life (less than 15 minutes) and are only suitable for escape. Chief limitations of SCBA devices are their weight or bulk, limited service life, and the training required for their maintenance and safe use.

12.1.2 Supplied-Air Respirators

The air supply is not limited to the quantity the individual can carry, and the devices are lightweight. A hose supplies the air to the mask from an outside source.

Limitations: The wearer is restricted in movement by the hose and must return to a respirable atmosphere by retracing his/her route of entry. The hose is subject to being severed or pinched off.

12.2 Air-Purifying Respirators (APR)

General Limitations: Air-purifying respirators do not protect against oxygen-deficient atmospheres.

- The design efficiency and capability of the cartridge, canister, or filter and the face seal determine the maximum contaminant concentration that an APR will protect. For gases and vapors, the maximum concentration for which the APR will protect the wearer varies from each manufacturer.
- The proper type of canister, cartridge, or filter must be selected for the particular atmosphere and condition. APR's should not be used in atmospheres that are immediately dangerous to life and health (IDLH).

12.2.1 Vapor and Gas-Removing Respirators

Limitations: No protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air. An uncomfortably high temperature indicates a high concentration of gas or vapor and requires that the wearer return to a fresh air atmosphere. The respirator should not be used in IDLH atmosphere.

12.2.2 Particulate-Removing Respirator

Limitations: Only protect against particulates. The respirator does not provide protection against gases and vapors. The respirator should not be used in IDLH atmospheres.

Appendix A

Medical Questionnaire

(Obtain copy on EH&S website)

Please Print Clearly. Please give information or details to any "yes" answers. This will help the Physician to better evaluate this questionnaire.

WAC 296-62-07255 Appendix C: WISHA Respirator Medical Evaluation Questionnaire--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E.

To the employer:
You must not review employee questionnaires.

To the employer's PLHCP:
Answers to questions in Section 1 and question 9 in Section 2 of Part A do not require further medical evaluations.

To the 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, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A., Section 1: Mandatory

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:_____ 2. Your name: _____
3. Your age (to nearest year):_____ 4. Sex (circle one): Male / Female
5. Your height:_____ft._____in. 6. Your weight:_____lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
9. The best time to telephone you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes / No
11. Check the type of respirator you will use (you can check more than one category):
    a._____ N, R, or P disposable respirator (dust mask style, half facepiece respirators without cartridges).

b._____ Check all that apply.

☐ Half mask ☐ Full facepiece mask ☐ Helmet hood ☐ Escape

☐ Non-powered cartridge or canister ☐ Powered air-purifying cartridge respirator (PAPR)

☐ Supplied-air or Air-line ☐ Disposable filtering facepiece (for example N-95)

Self contained breathing apparatus (SCBA): ☐ Demand or ☐ Pressure demand

Other: _____

12. Have you worn a respirator (circle one): Yes / No

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

WAC 296-62-07255 (Cont.)

Part A. Section 2. Mandatory

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (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. Asthma: Yes / No
   c. Chronic bronchitis: Yes / No
   d. Emphysema: Yes / No
   e. Pneumonia: Yes / No
   f. Tuberculosis: Yes / No
   g. Silicosis: Yes / No
   h. Pneumothorax (collapsed lung): Yes / No
   i. Lung cancer: Yes / No
   j. Broken ribs: Yes / No
   k. Any chest injuries or surgeries: Yes / No
   l. Any other lung problem that you've 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 breathe deeply: Yes / No

n. Any other symptoms that you think may be related to lung problems: Yes / No

WAC 296-62-07255 (Cont.)

Part A. Section 2. Mandatory (Cont.)

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 problem that you've 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 two 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've used a respirator, have you *ever had* any of the following problems? (If you've never used a respirator, check the following space and go 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 talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes / No

Stop Here if you are only going to use a Half-Face Respirator. Continue if you are going to use a Full-Face Respirator.

WAC 296-62-07255 (Cont.)

Part A. Section 3. <u>Mandatory for SCBA or Full Facepiece Respirator Users</u>

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

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 lbs: Yes / No
j. Any other muscle or skeletal problem that interferes with using a respirator: Yes / No

Appendix B

Assigned Protection Factors for Respirators

Type of Respirator	Assigned Protection Factor
Air-Purifying Respirators (APR) Half-Facepiece for: – Particulate Filter – Vapor or Gas-removing – Combination Particulate Filter/Gas or Vapor-removing	**10**
Air-Purifying Respirators (APR) Full-Facepiece for: – Particulate Filter – Vapor or Gas-removing – Combination Particulate Filter/Gas or Vapor-removing	**100**
Powered Air-Purifying Respirators (PAPR) Powered Air-Purifying, Loose Fitting Facepiece	**25**
Powered Air-Purifying Respirators (PAPR) Powered Air-Purifying, Half Facepiece	**50**
Powered Air-Purifying Respirators (PAPR) Powered Air-Purifying, Full Facepiece, Equipped with HEPA Filters	**1000**
Powered Air-Purifying Respirators (PAPR) Powered Air-Purifying, Hood or Helmet, Equipped with HEPA Filters	**1000**
Supplied-Air (airline) Respirators Supplied-Air, Demand, Half-Facepiece	**10**
Supplied-Air (airline) Respirators Supplied-Air, Continuous-Flow, Loose Fitting Facepiece	**25**
Supplied-Air (airline) Respirators Supplied-Air, Continuous-Flow or Pressure-Demand, Half-Facepiece	**50**
Supplied-Air (airline) Respirators Supplied-Air, Demand, Full-Facepiece	**100**
Self-Contained Breathing Apparatus (SCBA) SCBA, Demand-Type, Half-Facepiece	**10**
Self-Contained Breathing Apparatus (SCBA) SCBA, Demand-Type, Full-Facepiece	**100**
Self-Contained Breathing Apparatus (SCBA) SCBA, Pressure-Demand Type, Full-Facepiece	**10,000**

An assigned protection factor is a numeric rating given to respirators which tells how much protection the respirator can provide.

Appendix C

Color Coding of Respirator Filters, Cartridges, and Canisters

Atmospheric Contaminants to be Protected Against	Colors Assigned
Acid Gases	White
Hydrocyanic Acid gas	White with ½ inch green stripe completely around the canister near the bottom.
Chlorine Gas	White with ½ inch yellow stripe completely around the canister near the bottom.
Organic Vapors	Black
Ammonia Gas	Green
Acid Gases and Ammonia Gases	Green with ½ inch white stripe completely around the canister near the bottom.
Carbon Monoxide	Blue
Acid gases and Organic Vapors	Yellow
Hydrocyanic Acid gas and Chloropicrin Vapor	Yellow with ½ inch blue stripe completely around the canister near the bottom.
Acid Gases, Organic Vapors, and Ammonia Gases	Brown
Radioactive Materials, Except Tritium and Noble Gases	Purple (Magenta)
Particulates (Dusts, Fumes, Mists, Fogs, or Smokes) in Combination with any of the above gases	Canister color for contaminant, as designated above, with ½ inch gray stripe completely around the canister near the top.
All of the above Atmospheric Contaminants	Red with ½ inch gray stripe completely around the canister near the top.

Gray must not be assigned as the main color for a canister designed to remove acids or vapors.

Appendix D

General Fit-Testing Procedures

A. **Fit-Testing Procedures – General Requirements.** Fit-testing shall be conducted using the following procedures. The requirements in the appendix apply to all WISHA/OSHA-accepted fit test methods, both qualitative and quantitative.

1. Prior to the selection process, the test subject shall be shown:
    a. How to put on a respirator
    b. How it should be positioned on the face
    c. How to set strap tension
    d. How to determine an acceptable fit

    A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. The instruction may not constitute the subject's formal training on respirator use, because it is only a review.
2. From the selection of pre-approved respirators, the test subject shall be asked to select the respirator type and size that provides the most acceptable fit.
3. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
4. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to access comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.5.

    If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
5. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate 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. The following criteria shall be used to help determine the adequacy of the respirator fit:
    a. Chin properly placed
    b. Adequate strap tension, not overly tightened
    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. The test subject shall be conduct a user seal check, either the negative and positive pressure seal checks described in section 6.3 of CWU's Respiratory Protection Program or those recommended by the respirator manufacturer which provide equivalent protection. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.
8. The test shall not be conducted if there is any hair growth and/or clothing between the skin and the facepiece sealing surface.
9. If a test subject exhibits difficulty in breathing during the tests, he/she shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing his/her duties.
10. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.
11. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit rest.
12. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

B. Test Exercises

1. The following test exercises are to be performed for the fit-testing methods described in Section 6.0 of CWU's Respiratory Protection Program. The test subject shall perform exercises, in the test environment, in the following manner:
    a. **Normal breathing**. In a normal standing position, without talking, the subject shall breathe normally.
    b. **Deep breathing**. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
    c. **Turning head side-to-side**. Standing in place, the subject shall slowly turn his/her head from side-to-side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

d. **Moving head up and down**. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
e. **Talking**. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject reads from a prepared text. See Appendix E – *The Rainbow Passage*.
f. **Grimace**. The test subject shall grimace by smiling or frowning. (This applies onto to QNFT testing; it is not performed for QLFT).
g. **Bending over**. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.
h. **Normal breathing**. Same as exercise a.

2. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol, If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

Appendix E

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 his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Appendix F

Respirator Fit Test Record
(Example)

Name: _____ **Initials:** _____

Type of Qualitative Fit Test: _____

Name of Test Operator: _____ **Initials:** _____

Date: _____

Respirator Type	Model	Size	Pass / Fail
#1		S M L	Pass Fail
#2		S M L	Pass Fail
#3		S M L	Pass Fail
#4		S M L	Pass Fail

Notes: _____

This record indicates that you have passed or failed a qualitative fit test as shown above the particulate respirator(s) shown. Other types should not be used until fit tested.

I have received training and instruction in the selection, use and care of a respirator suitable for protection against airborne contaminants in my work assignment. I understand the elements of this respiratory protection program and will apply them in the daily use, care, and safekeeping of the respirator assigned to me.

Signature: _____

Appendix G

Definitions and Acronyms

Administration Controls: Controls include limiting the length of time an employee is exposed to hazardous atmosphere (i.e., Standard Operating Procedures – SOPs).

Air-purifying respirator means 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) is the minimum anticipated protection provided by a properly functioning respirator or class of respirators to a given percentage of properly fitted and trained users. The APF for a respirator is assigned by NIOSH and with the MUC helps to determine the appropriate respirator.

Atmosphere-supplying respirator means a respirator that supplies the respirator 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 means a container with a filter, sorbent, or catalyst, or a combination of these items, which removes specific contaminants from the air passed through the containers.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to thee facepiece only when a negative pressure is created inside the facepiece by inhalation.

EH&S means Central Washington University's Environmental Health & Safety Department who is designated as the Respiratory Protection program Administrator.

Emergency exposure means any occurrence 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 means an exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

Engineering Controls: Controls may include working in chemical fume hoods, enclosures, or modify work process/equipment to decrease the exposure of hazardous atmospheres.

End-of-Service-Life Indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

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

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

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

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

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

High Efficiency Particulate Air (HEPA) filter means a filter that is at least 99.97% 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 means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately Dangerous to Life and Health (IDLH) means 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.

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

Maximum Use Concentration (MUC) is 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 usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the NIOSH Recommended Exposure Limit (REL), Permissible Exposure Limit (PEL), Short Term Exposure Limit (STEL), Ceiling Limit (CL), Peak Limit (PK), or any other exposure limit used for the hazardous substance.

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

National Institute of Occupational Safety and Health (NIOSH) is the agency which test and certifies respirators.

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

Program Administrator means the Central Washington University's Environmental Health & Safety Department.

Physician or other Licensed Health Care Profession (PLHCP) means an individual whose legally permitted scope or practice (i.e., license, registration, or certification) allows him/her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required under Section 4.0 of CWU's Respiratory Protection Program.

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

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

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

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

Quantitative Fit Test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

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

Self-Contained Breathing Apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

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

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

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

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