

## Respiratory Protection Program

### I. Purpose

The intent of this written program is to define the rules regarding the use of respirators for personal protection at Montana Tech as stated in OSHA 29 CFR 1910.134. Strict adherence to the provisions contained in this program is necessary to prevent exposure of Montana Tech employees to potentially hazardous airborne contaminants.

See Appendix A for definitions

### II. General

A. The respective departments at Montana Tech shall provide respirators when deemed necessary to protect the health of the employee. Employee protection through the use of engineering controls, well designed work practices, the substitution of lower-toxicity materials, or some combination of these shall be emphasized before respirator usage.

B. Respirator use will be required only after the respective department and the Environmental, Health & Safety (EH&S) office has determined that no other control method is feasible after performing a hazard assessment. See Appendix B for the Hazard Assessment Form.

If an employee dons a respirator, the respective department is responsible for compliance with all components of the Respiratory Protection Program and will bear the associated costs.

C. EH&S is responsible for implementation, training, and record keeping for this program.

D. Training and fit testing for respirator use will be conducted annually or as necessary by the EH&S office.

E. All personnel required to wear a respirator must pass an initial medical evaluation prior to using a respirator. See Appendix C for Medical Evaluation and the Medical evaluation form. The EH&S office will coordinate the evaluations, with the respective departments covering the cost for the medical evaluation.

F. Employees must comply with the requirements of the Respiratory Protection Program. Employees are responsible for proper use and maintenance of respirators in accordance with training received. Refer to Section IV on Training and Appendix D on Care and Maintenance of Respirators. See Appendix E on Respirator Selection.

### III. Availability of Respirators

A. Respirators must be supplied by the respective departments at no cost to the employee. The department may decide whether to issue each employee his/her own respirator or to issue on an "as needed basis" with the respirators returned after the task is completed.

- B. The departmental PI/contact is responsible for respiratory program oversight in their respective departments, and will ensure, through coordination/consultation with EH&S, that the appropriate respirators and cartridges are issued to employees.

### **III. Training of Employees**

- A. Prior to fit-testing, each employee who will be issued a respirator will be trained by the EH&S office in the proper use and maintenance of the respirator. Training shall be administered at least annually or as necessary.
- B. Employee training may be somewhat different for each respirator user depending on the hazard, but all training will include the following information:
  - 1. The need for respiratory protection and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
  - 2. An explanation of why engineering controls are not being applied or are not adequate and what effort is being made to reduce or eliminate the need for respirators;
  - 3. An explanation of why a particular type of respirator has been selected for a specific respiratory hazard;
  - 4. An explanation of the operation, capabilities and limitations of the respirator selected;
  - 5. The nature, extent, and effects of respiratory hazards in the workplace;
  - 6. How to inspect and don the respirator and check the seals. This includes a requirement that a fit check shall be done each time the respirator is donned or adjusted (positive and negative pressure test);
  - 7. How to maintain and store the respirator;
  - 8. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
  - 9. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
  - 10. The general requirements of the regulations.

### **IV. Record Keeping**

The following records must be maintained for the Respiratory Protection Program. The records will be kept in the EH&S Office; confidentiality will be maintained.

- A. Completed medical clearance forms;
- B. Employee Respirator Fit Testing Records;
- C. Employee Training Records;
- D. The specific types and models of respirators in use at the facility;
- E. Records or reports evaluating the respiratory protection program;
- F. SCBA Monthly Inspection Records, if appropriate;
- G. Verification that the vendor of compressed air cylinders is supplying Grade "D" air or better.

## **V. Respirator Program Evaluation**

- A. The Environmental, Health and Safety Office will monitor the effectiveness of this program by annual surveillance and evaluation of work areas where respirators are being used. Refer to Appendix F for Program Annual Evaluation Form.
- B. Appropriate changes to the Respiratory Protection Program will be made as necessary.

Questions concerning the Respiratory Protection Program should be directed to your supervisor and/or the Environmental, Health and Safety Office at 4463.

***Updated December 2015***

# Appendices

Appendix A	Definitions
Appendix B	Hazard Assessment
Appendix C	Medical Evaluation
Appendix D	Care and Maintenance of Respirators, Respirator Inspection Record
Appendix E	Respirator Selection/Assigned Protection Factors
Appendix F	Respiratory Protection Program Annual Evaluation
Appendix G	Fitting a Respirator/Respirator Fit Testing Procedures
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# Appendix A

## Definitions

- A. **Air purifying respirator** means a respirator which is designed to remove air contaminants (i.e. dust, fumes, mists, gases, vapors or aerosols) from the ambient air or air surrounding the respirator.
- B. **Assigned protection factor (APF)** means the number assigned by NIOSH to indicate the capability of a respirator to afford a certain degree of protection in terms of fit and filter/cartridge penetration.
- C. **Cartridge** means the element of a gas and vapor or particulate air-purifying respirator which contains the sorbent, filter and/or catalyst which removes specific contaminants from air drawn through it.
- D. **Employee exposure** means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.
- E. **Fit factor** means an estimate of the ratio of the average concentration of a challenge agent in a test chamber to the average concentration inside the respirator as worn with a high-efficiency filter.
- F. **Maximum use concentration (MUC)** means the maximum concentration of an air contaminant in which a particular respirator can be used based on the respirator's assigned protection factor.
- G. **Negative pressure respirator** means a respirator in which the air pressure inside the face piece is positive during exhalation in relation to the outside air pressure, and negative during inhalation in relation to the outside air pressure.
- H. **Positive pressure respirator** means an atmosphere-supplying respirator which is designed so that air pressure inside the face piece is positive in relation to the outside air pressure during inhalation and exhalation.
- I. **Qualitative fit test** means an assessment of the adequacy of respirator fit by determining whether or not an individual wearing the respirator can detect the odor, taste, or irritation of a contaminant introduced into the vicinity of the wearer's head.
- J. **Quantitative fit test** means an assessment of the adequacy of respirator fit by numerically measuring concentrations of a challenge agent inside and outside the face piece. The ratio of the two measurements is an index of leakage of the seal between the respirator face piece and the wearer's face.
- K. **Self-contained breathing apparatus (SCBA)** means an atmosphere-supplying respirator for which the breathing air source is not designed to be carried by the user.

## Appendix B

### Hazard Assessment

As required by 29 CFR 1910.134, the following must be included in a hazard assessment to determine the appropriate respiratory protection.

1. The nature of the hazard;
2. The physical and chemical properties of the air contaminant;
3. The adverse health effects of the respiratory hazard;
4. The relevant hazardous exposure level;
5. The results of workplace sampling of airborne concentrations of contaminants;
6. The nature of the work operation or process;
7. The period of time respiratory protection will be worn by employees during the work shift;
8. The work activities of the employees and the potential stress of these work conditions on employees wearing the respirators;
9. Fit test results;
10. Warning properties of the hazardous chemical;
11. The physical characteristics, functional capabilities, and limitations of the various types of respirators.

## Hazard Assessment for Respirator Use

Employee: \_\_\_\_\_

Department: \_\_\_\_\_

1. What hazard is present that would require use of a respirator?
2. What are the physical and chemical properties of the contaminant? a. Appearance/state (i.e. liquid, solid, color, etc.) _____ b. Odor threshold _____ c. Flash Point _____ d. Explosion limits (upper and lower) _____ e. Specific gravity _____ f. Vapor pressure _____ g. Vapor density _____
3. What are the warning signs of this contaminant (eye irritation, smell, etc.)
4. What are potential health effects from exposure to this contaminant? a. Acute _____ b. Chronic _____ c. Target organs _____
5. What are the exposure limits for the contaminant? OSHA PEL _____ TLV _____
6. Results of air sampling for this contaminant?
7. What is the nature of the process or operation that requires the use of a respirator?
8. How long will employee be required to use respirator during work shift?
9. What type of work activities will the employee be engaged in while wearing respirator?
10. What are potential stressors from these work activities (heat stress, cold stress, etc.)
11. Has employee been fit tested?      YES      NO
12. What type(s) of respirator is the employee allowed to wear based on the fit testing?
13. Based on the above information, what type(s) of respirators can the employee wear to protect himself from the identified hazard?

# Appendix C

## Medical Evaluation

- A. Using a respirator may place a physiological burden on employees. The burden will vary with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The respective departments at Montana Tech shall provide for a medical evaluation to determine the employee's ability to use a respirator before the employee is fit tested or required to use the respirator in the workplace. EH&S will assist the departments in providing for the required medical evaluations. Montana Tech may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.
- B. Montana Tech shall identify a licensed health care professional (LHCP) to perform medical evaluations using the medical questionnaire (see below). If an employee gives a positive response to any question among questions 1 through 8 in Section 2, Part A, or whose initial medical evaluation demonstrates the need for a follow-up medical examination, the respective department at Montana Tech shall ensure that a follow-up medical examination is provided. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the LHCP deems necessary to make a final determination.
- C. The EH&S Office of Montana Tech shall obtain a written recommendation from the LHCP regarding the employee's ability to use the respirator. This will include any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used. It will also include the need, if any, for follow-up medical evaluations.
- D. This medical evaluation will be provided before the employee is fit tested or dons a respirator. The respective departments at Montana Tech shall provide additional medical evaluations under the following conditions:
  1. An employee reports medical signs or symptoms that are related to ability to use a respirator;
  2. The LHCP, supervisor or respirator program administrator indicates that the employee needs to be reevaluated;
  3. Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or
  4. A change in workplace conditions that may result in a substantial increase in the physiological burden placed on an employee.
- E. Records of all medical clearances for respirator use shall become a part of the employee's respirator file kept in the Environmental, Health and Safety Office. These records are confidential, and will be maintained for at least 30 years after the employee's termination in accordance with 29 CFR 1910.20(d)(1)(I). The medical questionnaire and the results of any medical exams will be maintained by the medical facility. If the medical facility performing the medical evaluations changes, the records shall be transferred to the new facility.



## Respirator Medical Evaluation Questionnaire

Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Can you read?		YES	NO
<p><b>Your supervisor at Montana Tech 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 supervisor or other employees of Montana Tech must not look at or review your answers, and your supervisor must tell you how to deliver or send this questionnaire to the health care professional who will review.</b></p>			
<p><b>Part A. Section 1.</b>  <i>The following information must be provided by every employee who has been selected to use any type of respirator.</i></p>			
1. Name:		2. Today's date:	
3. Age (to nearest year):		4. Sex: MALE	FEMALE
5. Height: ft. in.		6. Weight:	
7. Job title:		8. Phone number where you can be reached by the health care professional who reviews this questionnaire:	
9. Best time to reach you:		10. Has your employer told you how to contact the health care professional who will review this questionnaire? YES NO	
<p>11. Check the type of respirator you will use (you can check more than one category)</p> <p>Disposable respirator (filter-mask, non-cartridge type)          Half or full-face air purifying          Powered air purifying, SCBA, supplied air</p>			
12. Have you worn a respirator? YES NO		13. If yes, what type(s)?	

<p><b>Part A. Section 2.</b>  <i>Questions 1-9 below must be answered by every employee who has been selected to use any type of respirator. Please check "YES" or "NO". If you answer yes to any of these questions, use the space at the end of the questionnaire to explain.</i></p>		
	YES	NO
1. Do you smoke tobacco or have you smoked tobacco in the last month?		
2. Have you ever had any of the following conditions		
a) Seizures		
b) Diabetes		
c) Allergic reactions that interfere with your breathing		
d) Claustrophobia		
e) Trouble smelling odors		

	YES	NO
3. Have you ever had any of the following pulmonary or lung problems?		
a) Asbestosis		
b) Asthma		
c) Chronic bronchitis		
d) Pneumonia		
e) Tuberculosis		
f) Silicosis		
g) Pneumothorax (collapsed lung)		
h) Lung cancer		
i) Broken ribs		
j) Any chest injuries or surgeries		
k) Any other lung problem that you've been told about		
4. Do you currently have any of the following symptoms of pulmonary or lung illness?		
a) Shortness of breath		
b) Shortness of breath when walking fast on level ground or walking up a slight hill or incline		
c) Shortness of breath when walking with other people at an ordinary pace on level ground		
d) Have to stop for breath when walking at your own pace on level ground		
e) Shortness of breath when washing or dressing yourself		
f) Shortness of breath that interferes with your job		
g) Coughing that produces phlegm (thick sputum)		
h) Coughing that wakes you early in the morning		
i) Coughing that occurs mostly when you are lying down		
j) Coughing up blood in the last month		
k) Wheezing		
l) Wheezing that interferes with your job		
m) Chest pain when you breathe deeply		
n) Any other symptoms that you think may be related to lung problems		
5. Have you ever had any of the following cardiovascular or heart problems?		
a) Heart attack		
b) Stroke		
c) Angina		
d) Heart failure		
e) Swelling in your legs or feet (not caused by walking)		
f) Heart arrhythmia (irregular heart beat)		
g) High blood pressure		
h) Any other heart problems		
6. Have you ever had any of the following cardiovascular or heart symptoms?		
a) Frequent pain or tightness in your chest		
b) Pain or tightness in your chest during physical activity		
c) Pain or tightness in your chest that interferes with your job		
d) In the past two years, have you noticed your heart skipping or missing a beat		
e) Heartburn or indigestion that is not related to eating		
f) Other problems that may be related to heart or circulation problems		

	YES	NO
7. Do you currently take any medication for any of the following problems?		
a) Breathing or lung problems		
b) Heart trouble		
c) Blood pressure		
d) Seizures		
8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, go to question 9.)		
a) Eye irritation		
b) Skin allergies or rashes		
c) Anxiety		
d) General weakness or fatigue		
e) Any other problems that interferes with use of your respirator		
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire?		

<b>Questions 10-15 below must be answered by every employee who has been selected to use either a full-face respirator or a self-containing breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.</b>		
	YES	NO
10. Have you ever lost vision in either eye (temporarily or permanently)?		
11. Do you currently have any of the following vision problems?		
a) Wear contact lenses		
b) Wear glasses		
c) Color blind		
d) Any other eye or vision problems		
12. Have you ever had an injury to your ears, including a broken ear drum?		
13. Do you have any of the following hearing problems?		
a) Difficulty hearing		
b) Wear a hearing aid		
c) Any other hearing or ear problems		
14. Have you ever had a back injury?		
15. Do you have any of the following musculoskeletal problems?		
a) Weakness in any of your arms, hands, legs, or feet		
b) Back pain		
c) Difficulty fully moving your arms, hands, legs, or feet		
d) Pain or stiffness when you lean forward or backward at the waist		
e) Difficulty fully moving your head up or down		
f) Difficulty fully moving your head side to side		
g) Difficulty bending at your knees		
h) Difficulty squatting to the ground		
i) Difficulty climbing a flight of stairs or a ladder carrying more than 25 lbs		
j) Any other muscle or skeletal problem that interferes with using a respirator		

**Part B. Must be completed by all employees. If you answer yes to any of these questions, use the space at the end of the question to explain.**

	YES	NO
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? a) If "YES" do you have feelings of dizziness, shortness of breath, pounding in your chest or other symptoms when you're working under these conditions?		
2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g. gasses, fumes, or dust), or have you come into skin contact with hazardous chemicals? • If "YES" name the chemicals if you know them _____		
3. Have you ever worked with any of the materials or any of the conditions listed below?		
a) Asbestos		
b) Silica (e.g. in sandblasting)		
c) Tungsten/cobalt (e.g. grinding or welding this material)		
d) Beryllium		
e) Aluminum		
f) Coal		
g) Iron		
h) Tin		
i) Dusty environments		
j) Any other hazardous exposures		
• 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. Have you been in the military services? • If "YES" were you exposed to biological or chemical agents (either in training or combat)?		
8. Have you ever worked on a HAZMAT team?		
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier, are you taking any other medicines for any reason, including over-the-counter medications? • If yes name the medications if you know them:		
10. Will you be using any of the following items with your respirator?		
a) HEPA filters		
b) Canisters (for example, gas mask)		
c) Cartridges		

	YES	NO
11. How often are you expected to use the respirator(s)? Check YES or NO for all answers		
a) Escape only (no rescue)		
b) Emergency rescue		
c) Less than 5 hours per week		
d) Less than 2 hours per week		
e) 2 to 4 hours per day		
f) Over 4 hours a day		
12. During the period you are using the respirator, is your work effort:		
a) Light (example: sitting while writing or performing light assembly work, or standing while operating a drill press.)		
• If "YES" how long during an average shift? ____ hrs ____ mins		
b) Moderate (example: sitting while nailing, standing while drilling, walking on a level surface, pushing a wheelbarrow with a heavy load (100 lbs))		
• If "YES" how long during an average shift? ____ hrs ____ mins		
c) Heavy (example: lifting a heavy load (50 lbs) from floor to waist or shoulder, shoveling, walking up 8-degree grade, climbing stairs with a heavy load)		
• If "YES" how long during an average shift? ____ hrs ____ mins		
13. Will you be wearing personal protective clothing and/or equipment (other than respirator) when you're using your respirator?		
• If "YES" describe the protective clothing or equipment:		
14. Will you be working under hot conditions (>77 F)?		
15. Will you be working under humid conditions?		
16. Describe the work you'll be doing while you're using your respirator:		
17. Describe any special or hazardous conditions you might encounter when you're using your respirator, for example, confined spaces, life-threatening gases:		
18. Provide the following information, if you know it, for each toxic substance you'll be exposed to when you're using your respirator:		
<ul style="list-style-type: none"> <li>Name of toxic substance 1: _____</li> <li>Estimated exposure level per shift: _____</li> <li>Duration of exposure per shift: _____</li> </ul>		
<ul style="list-style-type: none"> <li>Name of toxic substance 2: _____</li> <li>Estimated exposure level per shift: _____</li> <li>Duration of exposure per shift: _____</li> </ul>		

19. Describe any special responsibilities you'll have while using your respirator that may affect the safety and well-being of others (for example rescue or security)

20. Please use the following space to make comments for any "YES" answers that need further explaining. Refer to the Section, Part, and Question number.

# Appendix D

## Care and Maintenance of Respirators

- A. The employee is responsible for the cleanliness and maintenance of his/her own respirator, and will ensure that it is ready for use when needed.
- B. All equipment must be inspected by the employee before and after each use. Emergency equipment (self-contained breathing apparatus for emergency use) must be inspected before and after each use or at least monthly. A record will be kept of all emergency equipment inspections with the results recorded. See below for an inspection form for all respirators. Respirators will be inspected for the following:
  - 1. Tightness of connections
  - 2. Conditions of face piece
  - 3. Condition of head bands
  - 4. Condition of cartridges
  - 5. Condition of valves
  - 6. Pliability of rubber or elastomer parts
  - 7. Deterioration of rubber or elastomer parts
- C. Any problems with the respirator should be reported to the employee's immediate supervisor.
- D. Routinely used respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition. Routinely used respirators issued to more than one employee shall be cleaned and disinfected after each use. Respirators maintained for emergency use shall be cleaned and disinfected after each use. To clean and disinfect, carry out the following procedures:
  - 1. Remove the air purifying elements (cartridges, filters) from the respirator. They should never be washed and disinfected.
  - 2. Immerse the respirator in a warm (110oF [43oC] maximum) aqueous solution with a mild detergent or cleaner recommended by manufacturer. The respirator face piece and parts may be scrubbed gently with a soft brush.
  - 3. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
    - a) A solution of approximately one milliliter of laundry bleach to one liter of water at 110oF; or
    - b) A solution of approximately 0.8 milliliters of tincture of iodine (50 ppm iodine) to one liter of water at 110oF.
  - 4. After washing, rinse thoroughly with warm water (110oF) and allow to air dry or dry with clean, lintless cloth.
  - 5. After the respirator is completely dry, inspect for defects, attach the air purifying elements, and store in clean plastic bag.
  - 6. Do not hang respirators on the wall; always store in plastic bag or container. The face piece and exhalation valve must be in a normal position to prevent abnormal set of elastomer parts. All respirators shall be stored in a manner that protects them from damage, dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals.
  - 7. If any part of the respirator is unacceptable, replace that part or the entire respirator before use. Remember, wearing poorly maintained or malfunctioning respirators may be more dangerous than not wearing a respirator at all.

## Respirator Inspection Record

Name \_\_\_\_\_

Shop/Department \_\_\_\_\_

Respirator type (circle):    Dust mask    Half mask    ¼ mask    Full-face mask    SCABA

Use the following guidelines for your inspection. Inspect for:

1. *Disposable respirator*: Holes in filter, straps for elasticity and deterioration, metal nose clip
2. *Face piece (for all types)*: Excessive dirt, cracks, tears, holes, distortion
3. *Face piece (for full face)*: Cracked, scratched or loose-fitting lenses
4. *Head strap*: Breaks or tears, loss of elasticity, broken or malfunctioning buckles or attachments, excessively worn serrations on the head harness.
5. *Inhalation and exhalation valves*:
6. Detergent residue, dust particles or dirt on valve or valve seat, cracks, tears, or distortion in valve material or valve seat, missing or defective valve cover
7. *Filter elements*: Proper filter for the hazard, missing or worn gaskets, worn threads, cracks or dents in filter housing, deterioration of gas mask canister harness, service life indicator on applicable models.
8. *Hood, helmet, blouse or full suit*: Rips or torn seams, headgear suspension, cracks or breaks in face shield
9. *Air supply system*: breathing air quality, breaks or kinks in air supply hoses, and end fitting attachments, tightness of connections, proper setting of regulators and valves, correct operation of air-purifying elements, proper operation of carbon monoxide alarms or high-temperature alarms.

DATE	Check box if okay							
Face piece	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inhalation valve assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhalation valve assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Headbands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cartridge holder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harness assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hose assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speaking diaphragm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gaskets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Connections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rubber/elastomer parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note any defects, the date, and actions taken in the space below:



# Appendix E

## Respirator Selection

- A. Respirators shall be selected following a hazard assessment conducted jointly by Environmental, Health and Safety and the respective department. See Appendix B for hazard assessment requirements.
- B. Only NIOSH/MSHA approved respirators have been chosen for use in this program. EH&S and the respective department together will determine which respirator is appropriate for each situation.
- C. Where elastomeric face piece respirators are to be used, Montana Tech shall provide a sufficient selection of respirators so that the respirator is acceptable to, and correctly fits, the user.
- D. The concentration of any contaminant must not exceed the respirator's Maximum Use Concentration (MUC). The MUC is calculated by multiplying the respirator's Assigned Protection Factor (APF) by the OSHA Permissible Exposure Limit (PEL) for the contaminant in question. ( $MUC = APF \times PEL$ ). See below for assigned protection factors.
- E. Air purifying high efficiency respirators and disposable dust/mist masks have the following limitations that must be taken into consideration when selecting a respirator:
  - 1. Cannot be used in oxygen deficient areas (less than 19.5% oxygen by volume);
  - 2. Cannot be used in immediately dangerous to life or health (IDLH) concentrations;
  - 3. Cannot be used for protection against gases and vapors with poor warning properties unless equipped with an end-of-service life indicator;
  - 4. Half-face respirators offer no eye protection and may require the use of safety goggles or a full face respirator.
- F. Unless properly trained and fit tested, Montana Tech employees shall not don a supplied air respirator. When dangerous atmospheres are encountered in normal operations or in emergencies, the fire department or other appropriate personnel shall be called to respond.
- G. If a properly trained Montana Tech employee dons a supplied air respirator:
  - 1. Breathing air quality shall meet the requirements of the specification for Grade D as described in Compressed Gas Association Commodity Specification G-7.1-1989.
  - 2. In IDLH or oxygen-deficient areas, at least one additional person must be present as a standby. This person must have communication (visual, voice, or signal line) with workers at all times.

## Assigned Protection Factors

Type of Respirator <sup>12</sup>	Assigned Protection Factors			
	Half Mask Includes disposable half mask, ¼ mask, & half mask with elastomeric face pieces	Full face piece	Helmet/hood	Loose-fitting face piece
<b>Air purifying (APR)</b>	10	50	_____	_____
<b>Powered air purifying</b>	50	1000	25/1,000 <sup>3</sup>	25
<b>Supplied-Air</b>				
Demand mode	10	50	_____	_____
Continuous flow mode	50	1,000	25/1,000	25
Pressure Demand	50	1,000	_____	_____
<b>SCBA</b>				
Demand mode	10	50	50	_____
Pressure-demand mode	_____	10,000	10,000	_____

<sup>1</sup>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.

<sup>2</sup> The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

<sup>3</sup> 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.

# Appendix F

## Respiratory Protection Program Annual Evaluation

Evaluator: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

This evaluation is to be conducted annually by the Environmental, Health and Safety Coordinator. Two important aspects of the respiratory program are the periodic surveillance of work areas requiring respirators and an evaluation of the overall effectiveness of the respiratory protection program.

	YES	NO
1. Are work area conditions and employee exposures properly surveyed?		
2. Are respirators selected on the basis of hazards to which the employee is exposed?		
3. Are selections made by individuals knowledgeable of selection procedures?		
4. Are only NIOSH/MSHA approved respirators purchased and used?		
5. Have medical evaluations been performed on the users?		
6. Where practical, have respirators been issued to the users for their exclusive use?		
7. Are users given the opportunity to try on several respirators to determine whether the respirator they will be wearing is the best fitting one?		
8. Is fit testing done at appropriate intervals?		
9. Are those users who require corrective lenses properly fitted?		
10. Are users prohibited from wearing contact lenses when using respirators?		
11. Are respirators cleaned and disinfected after each use when different people use the same device, or as frequently as necessary for devices issued to individual users?		
12. Are respirators inspected before and after each use and during cleaning?		
13. Are individual records kept of respirator inspections?		
14. Are qualified individual/users instructed in inspection techniques?		
15. Is respiratory protective equipment designated for "emergency use" inspected monthly, in addition to after each use?		
16. Is a record kept of the inspection of "emergency use" respiratory protective equipment?		
17. Are respirators stored so as to protect them from dust, sunlight, heat, excessive moisture, or damaging chemicals?		
18. Are generic replacement parts used instead of the manufacturer's?		
19. Are repairs made by knowledgeable individuals?		
20. Are SCBA repairs made only by certified personnel?		
21. Are respirator users trained annually to use their respirator properly?		
22. Are respirator users trained in the selection of respirators?		

# Appendix G

## Fitting of Respirator

- A. Proper fitting of respirators is essential if employees are to receive the protection for which this program is designed. Each employee required to wear a respirator will be fit-tested by EH&S.
  1. If a quantitative fit test is used, a fit factor that is at least 10 times greater than the assigned protection factor of a negative-pressure respirator shall be obtained before that respirator is assigned to an individual. (i.e., for a half-mask negative pressure respirator, a fit factor of 100 (APF 10 x 10) is required.
  2. If a qualitative test is used, only validated protocols will be used.
  3. A respirator fit test will be carried out for each wearer prior to initial use and at least once every twelve months thereafter.
  4. These tests shall be documented. See Appendix H for fit test record.
  5. Fit test records shall be retained until the next fit test is administered.
  6. Fit testing will be done while the employee is wearing any protective equipment, such as safety glasses, goggles, face shield, welding helmet, etc., that will be worn during work activities and could interfere with the fit.
  
- B. In order to ensure a good face seal each time a respirator is worn, the following must be observed:
  1. The respirator and straps must be in place and worn in the appropriate position. To adjust head bands, pull the free ends tight until a comfortable fit is obtained. All straps shall be secure. The respirator should not be over tightened so as to be uncomfortable on the face.
  2. To adjust face piece properly, simply position chin firmly in cup and manually shift mask until the most comfortable position is located. Make final adjustments in the head band and do not break the nasal seal.
  3. Facial hair must not interfere with the face seal, since proper fit cannot be assured. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Other conditions that may prevent adequate face-to-face piece seal include absence of one or both dentures, or temple bars on glasses (when wearing full face respirators).
  4. Proper fit must be checked each time the respirator is worn. This is accomplished by performing a negative and positive fit check as described in the next section.

# Respirator Fit-Testing Procedures

## Definitions

**Approved Respirator:** A respirator that has been tested and found to meet minimum performance standards set by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

**Chamber:** Non-ventilated enclosed area (hood) placed over the employee's head to perform the fit testing.

**Clean Shaven:** No facial hair is allowed between the face and the sealing surface of the respirator or facial hair that interferes with the valve of the respirator.

**Negative-pressure test:** A test of the seal of a respirator facepiece to a subject's face that is performed both prior to the fit-test and prior to use of the respirator in the working environment. To perform the negative-pressure test, the subject should cover the filter cartridges with his/her hands or with plastic film and inhale. The mask should collapse against the subject's face and remain collapsed for 10 seconds.

**Positive-pressure test:** A test of the seal of a respirator facepiece to a subject's face that is performed both prior to the fit-test and prior to the use of the respirator in the working environment. To perform a positive-pressure test, the subject should cover the exhalation valve and exhale; a slight pressure buildup should be felt inside the mask with no evidence of outward leakage.

## Sampling equipment

Depending on whether one is doing a qualitative or quantitative fit test, the following equipment may be used:

- a. Approved negative pressure respirator
- b. Organic vapor cartridges (for isoamyl test)
- c. HEPA cartridges (for irritant smoke test)
- d. Isopropyl alcohol
- e. Isoamyl acetate (IAA)
- f. Irritant smoke tube
- g. Chamber
- h. Portacount for quantitative fit-test

## Procedure

- a. Medical approval must be on file as described in Section II E before fit-testing can proceed.
- b. Respirator Fitting: The individual and/or the department, with input from EH&S if requested, will select the most comfortable and appropriate respirator. Personal assessment includes:
  1. chin properly placed
  2. position of mask on nose

3. strap tension
  4. fit across nose bridge
  5. room for safety glasses
  6. distance from nose to chin
  7. room to talk
  8. tendency to slip
  9. cheeks filled out
  10. self-observation in mirror
  11. adequate time for assessment
- c. The employee must perform positive and negative pressure fit checks prior to fit-testing and prior to each use.
  - d. The employee must wear the respirator and cartridges for 10 minutes before entering the chamber if using isoamyl acetate or saccharin.
  - e. When using isoamyl acetate, the ampule shall be broken and placed in the chamber for two minutes prior to beginning test exercise.
  - f. When using irritant smoke, break both ends of the tube, and attach the tube to the bulb, or break the ampule in the center of the tube, depending on which device you are using. Before administering the test, a sensitivity check must be done by administering one puff no closer than 3 feet and have employee waft the smoke to themselves. Advise the employee that the smoke can be irritating to the eyes, and instruct the employee to keep his eyes closed during the test.
  - g. The following exercises shall be sequentially performed for both isoamyl and irritant smoke:
    - Breathing normal
    - Breathing deep and regular
    - Turning head side-to-side
    - Nodding head up and down
    - Talking aloud (Read Rainbow Passage)
    - Jog in place
    - Touch toes
    - Breath normal again
  - h. If at any time during the test the employee detects the banana-like odor of IAA or smells or tastes irritant smoke, the employee shall quickly exit the test area to avoid olfactory fatigue.
  - i. If a person cannot be fitted with the half-mask respirator, recheck the fit or try a different size, or if necessary, include a full facepiece model in the selection process.
  - j. Persons who have successfully passed this fit test may be assigned the use of the tested respirator in atmospheres with up to 10 times the PEL of airborne contaminants.

## Respirator Fit Testing Record

Name:	Department:
Date:	Next test due:
Respirator model:	Size:
Manufacturer:	Half or full face:
Test used:	Tested by:
Does the employee require use of other PPE, such as safety glasses, goggles, etc. when wearing a respirator?      YES      NO	
If YES, what PPE?	Was PPE worn during testing?      YES      NO

As of today:	YES	NO
Are you currently under a physician's care for a respiratory, cardiovascular, or bronchial ailment?		
Do you currently have a sinus, nasal, or ear infection?		
Do you have an impaired immune system?		
Are you allergic to stannic chloride or any tin compounds?		

Tests	Check if passed or record Portacount score
Positive pressure fit	
Negative pressure fit	
Breathing normal	
Breathing deeply	
Turning head side to side slowly	
Nodding head up and down slowly	
Grimace	
Reading Rainbow Passage	
Jog in place	
Touch toes	
Breathing normal again	
Overall score (Portacount)	

Comments:

Employee signature \_\_\_\_\_

Date \_\_\_\_\_

Tester signature \_\_\_\_\_

Date \_\_\_\_\_