RESPIRATOR PROTECTION PROGRAM GUIDE

CONTENT

The following sample respiratory protection program is provided to assist employers in developing their procedures so that they can meet the requirements of the standard and accomplish the goal of employee protection. As this is a generic program, all of the worksheets and instruction may not be relevant for all worksites. In some workplaces with more complex systems, more comprehensive procedures may need to be developed, documented, and utilized.

This model program was compiled by David Lundt, I. H. Consultant, 2600 Eltham Ave., Norfolk, Va., 23513-2504, 804-858-6700. A number of the concepts contained herein were originated and refined from programs used under the old standard. In addition, appreciation is expressed to Jeannie Buckingham and Judy Hinch from the Norfolk Enforcement Office who reviewed this program and offered constructive criticism.

RESPIRATOR PROTECTION PROGRAM

_____
Name of Company

_____

_____
Address

PURPOSE

The purpose of this operating procedure is to ensure the protection of all employees from respiratory hazards.

RESPONSIBILITY

The program administrator (s) is responsible for all (assigned) facets of this companies program and has full authority to make necessary decisions to ensure success of this program. This authority includes hiring personnel and equipment purchases necessary to implement and operate this program. The program administrator will adapt this program to the details of this operation, and is the sole person authorized to amend these instructions.

The program administrator is authorized to halt any operation of the company where there is a danger of serious personal injury from respiratory hazards.

The assigned program administrator for this company is _____
Name and or title

Respirator selection, employee evaluation, fit testing and training, work area surveillance may be done by the program administrator or parts such as fit testing and training may be delegated to others such as department supervisors.

The procedure followed in this company is as follows:_____
This program is a guide to basic requirements of the Standard. Each element is followed by white space for site specific description or policy to cover any unique conditions.

A. RESPIRATOR SELECTION

Respirator selection will begin by identifying and evaluating the respiratory hazard(s) in the workplace. This evaluation may include exposure monitoring, historical data or an reasonable estimate of employee exposures to respiratory hazard(s) based upon mathematical models. It will also include an identification of the contaminant's chemical state and physical form. When a reasonable estimate of the employee's exposure cannot be made, the atmosphere will be considered to be IDLH.

Separate specific procedures will be developed when there is planned entry into an IDLH atmosphere. Respirator selection will be as per 1910.134(d)(3).

Based on the hazards to which employees are exposed the following respirators have been selected for use at this plant: The selection worksheet found in Appendix A is a guide for this selection process.

LIST HAZARD OR HAZARDS	MANUFACTURER'S MODEL OR APPROVAL NO.

At least the following were considered:

a) The physical state of the air contaminant(s):
   1) gas or vapor
   2) particulate (dust, mist, fume, smoke, or fog)
   3) combination of (1) and (2);
b) permissible exposure limit;
c) actual exposure by measurement;
d) possibility of oxygen deficiency;
e) protection factor for the respirator;
f) whether contaminant irritates the eyes and/or is absorbed through the skin;
g) requirements of a specific standard (for example, formaldehyde).

Suitable respirators were then selected from the following categories:

a) negative pressure devices - negative pressure created in facepiece or inlet covering of respirator during inhalation (for example: non-powered air purifying respirators):
b) positive pressure devices - positive pressure maintained in facepiece or inlet covering at all times (for

example: self contained breathing apparatus operated in pressure - demand mode); possible IDLH exposure; c) atmospheric pressure devices - atmospheric pressure is maintained inside facepiece or inlet covering of the respirator (for example: continuous flow supplied air respirator).

Only NIOSH approved respirators are used. Employees are cautioned that a respirator is approved as a whole unit with specific components. Mixing of components between different types or makes of respirators nullifies the approval. Also, use of non approved components nullifies the approval. Where practicable, the respirators are assigned to individual workers for their exclusive use.

B. MEDICAL EVALUATION

Before being fit tested and assigned to tasks requiring use of a respirator, the employee will complete in full the medical questionnaire found in Appendix B of this program..

That medical questionnaire will be reviewed by _____, the company=s Physician or other licensed health care professional (PLHCP).

The PLHCP will be given a copy of 1910.134 and of this program..

THE INFORMATION IN THE MEDICAL QUESTIONNAIRE WILL BE KEPT CONFIDENTIAL, <u>BEING REVIEWED</u> ONLY BY THE PLHCP.

The respirator user's medical status will be followed up whenever the employee reports medical signs or symptoms related to ability to use a respirator; the PLHCP, program administrator, or supervisor recommends reevaluation; information from the respirator program, including observations made during fit testing and program evaluation, indicates a need; or change occurs in workplace conditions that may substantially increase the physiological burden on an employee.

A <u>written recommendation</u> regarding the employee=s ability to use the respirator will be obtained from the PLHCP before the employee is fit tested and assigned a respirator. A sample medical evaluation form is found in Appendix B3.

OR

The employee will be given a initial medical examination that obtains the same information as the medical questionnaire (information required is contained in mandatory Appendix C of 1910.134).

NOTES:

C. FIT TESTING

The employee will be fit tested before being assigned a respirator for use in an actual or potentially hazardous atmosphere. The fit test protocol found in Appendix C of this program. Before being fitted tested, the employee will be trained in and pass the seal test described in Appendix C1. Employee are trained to use the seal check each time the respirator is donned.

The fit test protocol will follow one or more of the methods described in Appendix C2. Two methods are recommended.

Both negative pressure and positive pressure tight-fitting respirators will be fit tested.

Tight-fitting respirators will not be worn by employees who have facial hair or any condition that interferes with the face-to-facepiece seal or valve function. Personal protective equipment will be worn in such a manner that does not interfere with the seal of the facepiece to the face of the user.

Employees are cautioned to wear respirators as originally designed, i.e., all parts in place, straps secure, no part modified, nothing between respirator and face (facelets void the approval of respirators).

Loose-fitting respirators do not require a qualitative or quantitative fit test.

A fit test worksheet is found in Appendix C3.

The following person(s) is in charge of insuring that each respiratory user is properly fitted tested

_____

Name and or title

NOTES:

D. TRAINING

The employee will be trained in the use of the respirator before being assigned a respirator for use in an actual or potentially hazardous atmosphere. The training will include at least the following:

- ! Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- ! What the limitations and capabilities of the respirator are;
- ! How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- ! How to inspect, put on and remove, use, and check the seals of the respirator;
- ! What the procedures are for maintenance and storage of the respirator;
- ! How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- ! The general requirements of the standard.

The following person(s) is in charge of insuring that each respiratory user is properly fitted tested

_____

Name and or title

Notes:

E. CLEANING AND INSPECTION

Respirators will be cleaned by the program administrator, another assigned person or the employee. Cleaning and sanitation will be done at least as follows:

- as often as necessary to maintain a sanitary condition for exclusive use respirators,
- before being worn by different individuals when issued to more than one employee, and
- after each use for emergency use respirators and those used in fit testing and training.

The methods of cleaning and sanitizing will follow the manufacturers protocol or as described in Appendix D.

Where each employee cleans and disinfects his/her own respirator, regular inspections are made to be sure respirators are properly cleaned and disinfected after each use or as often as necessary to insure the protection of the wearer. Checks are also made to be sure suitable respiratory equipment is readily available and in good condition for immediate use where such use may be required.

Respirators are stored in convenient, clean and sanitary locations.

Respirators are inspected during cleaning and defective respirators are repaired by experienced individual with parts designated for the respirator. Inspection record in Appendix E1.

Self contained breathing apparatus and respirators for emergency use are inspected at least once a month and after each use. Inspection records are kept for respirators available for emergency use. Inspection record in Appendix E2.

The following person(s) is in charge of insuring that each respirator is properly cleaned, sanitized, and inspected:

_____

Name and or title

NOTES:

F. BREATHING AIR

Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen will meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and
- Compressed breathing air will meet at least the requirements for Type 1-Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
  - Oxygen content (v/v) of 19.5-23.5%;
  - Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
  - Carbon monoxide (CO) content of 10 ppm or less;
  - Carbon dioxide content of 1,000 ppm or less; and
  - Lack of noticeable odor.

Compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air. Oxygen concentrations greater than 23.5% will be used only in equipment designed for oxygen service or distribution.

Cylinders used to supply breathing air to respirators meet the following requirements:

- Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);
- Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1--Grade D breathing air; and
- The moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure.

Compressors used to supply breathing air to respirators are constructed and situated so as to:

- Prevent entry of contaminated air into the air-supply system;
- Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;
- Suitable in-line air-purifying sorbent beds and filters are being used further ensure breathing air quality. Sorbent beds and filters will be maintained and replaced or refurbished periodically following the manufacturer's instructions. A tag containing the most recent change date and the signature of the person authorized by the employer to perform the change will be maintained at the compressor.
- For compressors that are not oil-lubricated, the carbon monoxide levels in the breathing air will not exceed 10 ppm. This will be done by location of air inlet away from possible CO sources.
- For oil-lubricated compressors, a high- temperature or carbon monoxide alarm, or both, will be used to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm. That will be done at least once a shift.

Breathing air couplings are selected which are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines. Breathing gas containers will be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

Notes:

G. VOLUNTARY USE

The voluntary use of an **elastomeric mask** will be included in the written program to ensure that the employee is medically able to use the respirator, the respirator does not present a health hazard, and they are provide a copy of Appendix F of this document (Appendix D of 1910.134). In addition, the program will address medical evaluation, cleaning, disinfecting, storage and maintenance.

The voluntary use of a **filtering facepieces** is not included in a written program and the employee is only provided the information contained in Appendix F of this document (Appendix D of 1910.134).

To the extent that the above items may create an expense, these costs would be covered by the employer. The employer can choose to supply the respirator and cartridges at no cost to the employee. If the employee supplies his/her own respirator, the cost of the respirator and cartridges would be the responsibility of the employee. For **voluntary users wearing dust** masks, the employer must provide at no cost to the employee, a copy of Appendix D. Where respiratory protection is required either by the employer or by the OSHA, the employer must pay all costs associated with the standard.
List where respirators are being used voluntarily:

Employee and work area:	Type used:

NOTES:

H. PROGRAM EVALUATIONS

There will be periodic evaluations of the workplace as necessary to ensure proper implementation of the program. Any problems identified will be corrected. Evaluation will include but not be limited to

- ! Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- ! Appropriate respirator selection for the hazards to which the employee is exposed;
- ! Proper respirator use under the workplace conditions the employee encounters; and
- ! Proper respirator maintenance.

Employees will be consulted to ensure that respirators are being used properly and that no problems with use have developed.

The following person(s) will conduct the evaluation

_____

Name and or title

NOTES:

_____

Approved

_____

Title

_____

Date

RPP -- APPENDIX - A

RESPIRATOR SELECTION WORKSHEET

*** CIRCLE OR FILL IN APPROPRIATE ANSWER**

LOCATION:		
A - Material(s) used:	a. Chemical Name	
	b. Trade Name	
	c. Formula	

B - Allowable worker exposure limits,	VOSH/OSHA PEL?	ANY CEILING OR STEL?	ACGIH TLV OR STEL?	OTHER STANDARDS? COMPANY?

C - Form in which the chemical will be used:		Liquid?	Solid?	Gaseous?
	If gaseous, is it an	organic vapor?	acid gas?	other? - what?

D - Maximum expected concentration-	parts per million,	milligrams per cubic meter of air
E - Duration of exposure to maximum expected concentration.		

F - How exposure determined	Full shift monitoring	STEL monitoring	Calculation using vapor pressure
G - Will material be heated?		if so, to what temperature?	

H - What is the odor threshold of the material?	I - Can the substance be absorbed through the skin?
J - At what concentration is the material considered to be immediately dangerous to life or health?	

k - Is it an irritant to the eyes?	respiratory tract?	skin?
At what concentration is it an irritant?		

L - If the substance is known to be flammable, what are the lower and upper flammable limits (UFL-LFL or LEL-UEL) in percent by volume?	(UFL-LFL	LEL-UEL)
M - What is the vapor pressure of the material?		

N - Is there any possibility of oxygen deficiency?	O - Can good ventilation of the area be maintained?
P - Will the material be mixed with other chemicals? if so, give details:	

Q - Will exposure be continuous?		intermittent?
R - Will the respiratory device be used for routine exposures,	as an escape device	emergency reentry device?
Provide as much further detail as possible concerning exposure conditions.		

*This worksheet is a modification of Mine Safety Appliances Bulletin 1000-16, and acknowledgment is hereby given to MSA for the original idea.

RPP -- APPENDIX - B1

Medical Questionnaire (Mandatory)

To the employer: 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 (circle one): Yes/No

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 phone 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 (filter-mask, non-cartridge type only).		b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).	
12. Have you worn a respirator (circle one): Yes/No		If ``yes,'' what type(s):	

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

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

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
e. 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

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

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're working under these conditions: 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. Silica (e.g., in sandblasting): Yes/No c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No d. Beryllium: Yes/No e. Aluminum: Yes/No f. Coal (for example, mining): Yes/No g. Iron: Yes/No h. Tin: Yes/No i. Dusty environments: Yes/No j. Any other hazardous exposures: 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. Have you been 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:

10. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: Yes/No
b. Canisters (for example, gas masks): Yes/No
c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle ``yes'' or ``no'' for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No
b. Emergency rescue only: Yes/No
c. Less than 5 hours per week: Yes/No
d. Less than 2 hours per day: Yes/No
e. 2 to 4 hours per day: Yes/No
f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your 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 a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

During the period you are using the respirator(s), is your work effort:
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 or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) 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 lbs.) on a level surface.

During the period you are using the respirator(s), is your work effort:
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 lbs.) 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 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If ``yes,'' describe this protective clothing and/or equipment:-

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance:		Name of the third toxic substance:	
Estimated maximum exposure level per shift		Estimated maximum exposure level per shift	
Duration of exposure per shift		Duration of exposure per shift	
Name of the second toxic substance:-		Name of the forth toxic substance:-	
Estimated maximum exposure level per shift:		Estimated maximum exposure level per shift:	
Duration of exposure per shift		Duration of exposure per shift	

The name of any other toxic substances that you'll be exposed to while using your respirator.

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

RPP -- APPENDIX - B2

Cuestionario de Evaluación Médico obligado por la OSHA (La agencia de seguridad y salud ocupacional)
Parte 29 CFR 1910.134 Mandatorio para Proteccion del Sistema Respiratorio
Marque con un circulo para indicar sus respuestas a cada pregunta.

Para el empleado: Puede usted leer (circule uno): Sí o No

Su patrón debe dejarlo responder estas preguntas durante horas de trabajo o en un tiempo y lugar que sea conveniente para usted. Para mantener este cuestionario confidencial, su patrón o supervisor no debe ver o revisar sus respuestas. Su patrón debe informarle a quien dar o enviar este cuestionario para ser revisado por un profesional de sanidad con licencia autorizado por el estado.

Parte A. Sección 1.

(Mandatorio). La siguiente información debe de ser proveida por cada empleado que ha sido seleccionado para usar cualquier tipo de respirador (escriba claro por favor).

1. Fecha :_____

2. Nombre:_____
3. Edad:_____
4. Su sexo (circule uno) Masculino o Femenino
5. Altura: _____pies _____pulgadas
6. Peso: _____libras
7. Su ocupación, título o tipo de trabajo: _____
8. Número de teléfono al donde pueda ser llamado por un profesional de sanidad con licencia que revisara este cuestionario (incluya el área):_____
9. Indique la hora mas conveniente para llamarle a este numero:_____
10.) Le ha informado su patrón como comunicarse con el profesional de sanidad con licencia que va a revisar este cuestionario (circule una respuesta)? ..... Sí o No
11. Anote el tipo de equipo protector respíratorio que va utilizar (puede anotar mas de una categoría)

a._____ Respirador disponible de clase N, R, o P (por ejemplo: respirador de filtro mécanico, respirador sin cartucho)

b._____ Otros tipos (respirador con cartucho químico, máscara con cartucho químico, máscara con manguera con soplador (PAPR),máscara con manguera sin soplador (SAR), aparato respiratorio autónomos (SCBA)).

12.) Ha usado algun tipo de respirador ? ..... Sí o No

Si ha usado equipo protector respíratorio, que tipo(s) ha utilizado:

Parte A. Seccion 2.

(Mandatorio): Preguntas del 1 al 9 deben ser contestadas por cada empleado que fue seleccionado a usar cualquier tipo de respirador. Marque con un circulo para indicar sus repuestas.

1.) Corrientemente fuma tabaco, o ha fumado tabaco durante el ultimo mes? ..... Sí o No
2.) Ha tenido algunas de las siguientes condiciones medicas?

a. Convulsiones : ..... Sí o No
b. Diabetes (azucar en la sangre): ..... Sí o No
c. Reacciones alergicas que no lo deja respirar: ..... Sí o No
d. Claustrofobia (miedo de estar en espacios cerrados): ..... Sí o No
e. Dificultad oliendo excepto cuando ha cogido un resfriado: ..... Sí o No

3.) Ha tenido algunas de los siguientes problemas pulmonares?

a. Asbestosis: ..... Sí o No
b. Asma: ..... Sí o No
c. Bronquitis cronica: ..... Sí o No
d. Emfisema: ..... Sí o No

e. Pulmonía: ..... Sí o No
f. Tuberculosis: ..... Sí o No
g. Silicosis: ..... Sí o No
h. Neumotorax (pulmon colapsado): ..... Sí o No
i. Cáncer en los pulmones: ..... Sí o No
j. Costillas quebradas: ..... Sí o No
k. Injuria o cirujía en el pecho: ..... Sí o No
l. Algun otro problema de los pulmones que le ha dicho su medico: ..... Sí o No
4.) Corrientemente tiene alguno de los siguientes síntomas o enfermedades en sus pulmones?
a. Respiración dificultosa ..... Sí o No
b. Respiración dificultosa cuando camina rapido sobre terreno plano o subiendo una colina: Sí o No
c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno plano: Sí o No
d. Cuando camina normalmente en terreno plano se encuentra corto de resuello? ..... Sí o No
e. Respiración dificultosa cuando se esta bañando o vistiendo: ..... Sí o No
f. Respiración dificultosa que lo impede trabajar: ..... Sí o No
g. Tos con flema: ..... Sí o No
h. Tos que lo despierta temprano en la mañana: ..... Sí o No
i. Tos que occure cuando esta acostado: ..... Sí o No
j. Ha tosido sangre en el ultimo mes: ..... Sí o No
k. Silbar o respirar con mucha dificultad: ..... Sí o No
l. Silbar que lo impede trabajar: ..... Sí o No
m. Dolor del pecho cuando respira profundamente: ..... Sí o No
n. Otros símtomas que crea usted estar relacionados a los pulmones: ..... Sí o No
5.) Ha tenido algunos de los siguientes problemas con el corazón?
a. Ataque cardiaco: ..... Sí o No
b. Ataque cerebrovascular: ..... Sí o No
c. Dolor en el pecho: ..... Sí o No
d. Falla de corazón: ..... Sí o No
e. Hinchazón en las piernas o pies (que no sea por caminar): ..... Sí o No
f. Latidos irregulares del corazón: ..... Sí o No
g. Alta presión: ..... Sí o No
h. Algun otro problema cardio-vascular o cardiaco: ..... Sí o No
6.) Ha tenido algunos de los siguientes síntomas causados por su corazón?
a. Dolor de pecho frecuente o pecho apretado: ..... Sí o No
b. Dolor o pecho apretado durante actividad fisica: ..... Sí o No
c. Dolor o pecho apretado que no lo deja trabajar normalmente: ..... Sí o No
d. En los ultimos dos años ha notado que su corazón late irregularmente: ..... Sí o No
e. Dolor en el pecho o indigestion que no es relacionado a la comida: ..... Sí o No
f. Algunos otros síntomas que usted piensa ser causado por problemas de su corazón o de su circulation.
..... Sí o No
7.) Esta tomando medicina por algunso de los siguientes problemas?
a. Respiración dificultosa: ..... Sí o No
b. Problemas del corazón: ..... Sí o No
c. Alta presión : ..... Sí o No
d. Convulsiones: ..... Sí o No
8.) Le ha causado alguno de los siguientes problemas usando el respirador? (si no ha usado un respirador, deje esta pregunta en blanco__ y continue con pregunta 9).
a. Irritación de los ojos: ..... Sí o No
b. Alergias del cutis o sarpullido: ..... Sí o No
c. Ansiedad que ocurre solamente cuando usa el respirado: ..... Sí o No
d. Debilidad, falta de vigor o fatiga desacostumbrada: ..... Sí o No
e. Algun otro problema que le impida utilizar su respirador: ..... Sí o No

9.) Le gustaria hablar con el profesional de sanidad con licencia autorizado por el estado que revisara este cuestionario sobre sus respuestas? ..... Sí o No

Las preguntas del 10 al 15 deben ser contestadas por los empleados seleccionados para usar una máscara con cartucho químico o aparato respiratorio autónomo (SCBA). Los empleados que usan otro tipo de respirador no tienen que contestar estas preguntas.

10.) Ha perdido la vista en cualquiera de sus ojos (temporalmente o permanente): ..... Sí o No
11.) Corrientemente tiene algunos de los siguientes problemas con su vista?
a. Usa lentes de contacto: ..... Sí o No
b. Usa lentes: ..... Sí o No
c. Daltoniano (dificultad distinguiendo colores): ..... Sí o No
d. Tiene algún problema con sus ojos o su vista: ..... Sí o No
12.) Ha tenido daño en sus oidos incluyendo rotura del tímpano: ..... Sí o No
13.) Corrientemente tiene uno de las siguientes problemas para oir?
a. Dificultad oyendo: ..... Sí o No
b. Usa un aparato para oir: ..... Sí o No
c. Tiene algun otro problema con sus oidos o dificultad escuchando: ..... Sí o No
14.) Se ha dañado o lastimado su espalda? ..... Sí o No
15.) Tiene uno de los siguientes problemas de su aparato muscular or eskeleto?
a. Debilidad en sus brazos, manos, piernas o pies : ..... Sí o No
b. Dolor de espalda: ..... Sí o No
c. Dificultad para mover sus brazos y piernas completamente: ..... Sí o No
d. Dolor o engarrotamiento cuando se inclina para adelante o para atras: ..... Sí o No
e. Dificultad para mover su cabeza para arriba o para abajo completamente: ..... Sí o No
f. Dificultad para mover su cabeza de lado a lado: ..... Sí o No
g. Dificultad para agacharse doblando sus rodillas: ..... Sí o No
h. Dificultad para agacharse hasta tocar el piso: ..... Sí o No
i. Dificultad subiendo escaleras cargando mas de 25 libras: ..... Sí o No
j. Alguno problema muscular o con sus huesos que le evite usar un respirador: ..... Sí o No

Parte B - Las siguientes preguntas pueden ser agregadas al cuestionario a discrecion del profesional de sanidad con licencia autorizado por el estado.

1.) Esta trabajando en las alturas arriba de 5,000 pies o en sitios que tienen menos oxígeno de lo normal? ..... Sí o No

Si la respuesta es ASí@, se ha sentido mareado, o ha tenido dificultad respirando, palpitaciones, o cualquier otro síntoma que usted no tiene cuando no esta trabajando bajo estas condiciones: ..... Sí o No

2.) En el trabajo o en su casa, ha estado expuesto a solventes o contaminantes peligrosos en el aire (por ejemplo, humos, neblina o polvos) o ha tenido contacto del cutis con químicas peligrosas? ..... Sí o No

Escriba las químicas y productos con las que ha estado expuesto, si sabe cuales son:_____

3.) Ha trabajado con los siguientes materiales o las condiciones anotadas abajo?:
a. Asbestos: ..... Sí o No
b. Sílice (Limpiar mediante un chorro de arena): ..... Sí o No
c. Tungsteno/Cobalto (pulverizar o soldadura): ..... Sí o No
d. Berilio: ..... Sí o No
e. Aluminio: ..... Sí o No
f. Carbón de piedra (minando): ..... Sí o No
g. Hierro: ..... Sí o No
h. Estaño: ..... Sí o No
i. Ambiente polvoriento: ..... Sí o No
j. Otra exposicion peligrosa: ..... Sí o No

Describa las exposiciones peligrosas:

_____

4.) Tiene usted otro trabajo o un negocio aparte de este?

_____

5. Apunte su previos trabajos:

_____

6. Apunte sus pasatiempos:

7.) Tiene servicio militar? ..... Sí o No

Si la respuesta es ASí@, ha estado expuesto a agentes químicos o biologicos durante entrenamiento o combate: ..... Sí o No

8.) Alguna vez ha trabajado en un equipo de HAZMAT (equipo respondedor a incidentes de materiales peligosos con emergencia)? ..... Sí o No

9.) Esta tomando alguna medicina que no haya mencionado en este cuestionario (incluyendo remedios caseros o medicinas que compra sin receta)? ..... Sí o No

Si la respuesta es ASí@, cuales son_____

10.) Va a usar algunas de las siguientes partes con su respirador?

a. filtros HEPA (filtro de alta eficiencia que remueve partículas tóxicas en la atmósfera): .... Sí o No

b. Canastillo (por ejemplo, máscara para gas): ..... Sí o No

c. Cartuchos: ..... Sí o No

11.) Cuántas veces espera usar un respirador?

a. Para salir de peligro solamente (no rescates): ..... Sí o No

b. Recates de emergencia solamente: ..... Sí o No

c. Menos de 5 horas por semana: ..... Sí o No

d. Menos de 2 horas por día: ..... Sí o No

e. 2 a 4 horas por día: ..... Sí o No

f. Mas de 4 horas por día: ..... Sí o No

12.) Durante el tiempo de usar el respirador, su trabajo es...?

a. Ligero (menos de 200 kcal por hora): ..... Sí o No

Si la respuesta es Así@, cuanto tiempo dura la obra _____horas _____minutos

Ejemplos de trabajos ligeros: estar sentado escribiendo, escribiendo a máquina, diseñando, trabajando la línea de montaje, o estar parado gobernando un taladro o máquinas:

b. Moderado (200-350 kcal por hora): ..... Sí o No

Si la respuesta es Así@cuanto tiempo dura en promedio por jornada _____horas_____minutos

Ejemplos de trabajos moderados : sentado clavando o archivando; manejando un camión o autobús en trafico pesado; estar de pie taladrando, clavando, trabajando la línea de montaje, o transferiendo una carga (de 35 libras) a la altura de la cintura; caminando sobre tierra plana a 2 millas por hora o bajando a 3 millas por hora; empujando una carretilla con una carga pesada (de 100 libras) sobre terreno plano.

c. Pesado (mas de 350 kcal por hora): ..... Sí o No

Si la respuesta es Así@cuanto tiempo dura en promedio por jornada _____horas_____minutos

Ejemplos de trabajos pesados: levantando cargas pesadas (mas de 50 libras) desde el piso hasta la altura de la cintura o los hombros; trabajando cargando o descargando; transpalear; estar de pie trabajando de albañil o demenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una carga pesada (mas de 50 libras).

13.) Va a estar usando ropa o equipo protectivo cuando use el respirador? ..... Sí o No

Si la respuesta es Así@ describa que va a estar usando_____

_____

14.) Va a estar trabajando en condiciones calurosas (temperatura mas de 77 grados F)? ..... Sí o No

15.) Va a estar trabajando en condiciones humedas? ..... Sí o No

16. Describa el tipo de trabajo que va a estar usted haciendo cuando use el respirador.

_____

17. Describa cualquier situacion especial o peligrosa que pueda encontrar cuando este usando el respirador (por ejemplo, espacios encerrados, gases que lo puedan matar, etc.)

_____

18. Provea la siguiente informacion si la sabe, por cada sustancia tóxica que usted va a estar expuesto cuando este usando el respirador(s):

Nombre de la primera sustancia tóxica_____

Maximo nivel de exposición por jornada de trabajo_____

Tiempo de exposición por jornada_____

Nombre de la segunda sustancia tóxica_____

Maximo nivel de exposición por jornada de trabajo_____

Tiempo de exposición por jornada_____

Nombre de la tercera sustancia tóxica_____

Máximo nivel de exposición por jornada de trabajo_____

Tiempo de exposición por jornada_____

El nombre de cualquier sustancia tóxica que usted va a estar expuesto cuando este usted usando el respirador_____

_____

19. Describa alguna responsabilidad especial que usted va a tener cuando usted este usado el respirador(s) que pueda afectar la seguridad o la vida de otros (por ejemplo, rescate, seguridad).

RPP -- APPENDIX B3

REQUEST FOR MEDICAL CLEARANCE FOR RESPIRATOR USE QUESTIONNAIRE

NAME OF EMPLOYEE	SOC. SEC. NO.	DATE OF BIRTH
SUPERVISOR	DEPARTMENT	

CIRCLE TYPE OR TYPES OF RESPIRATOR(S) TO BE USED:

atmosphere supplying respirator;	continuous flow respirator	open circuit SCBA:
closed circuit SCBA;	supplied air respirator	combination air line and SCBA
air purifying (non powered)	air purifying (powered)	

LEVEL OF WORK EFFORT: (CIRCLE ONE)

LIGHT	MODERATE	HEAVY	STRENUOUS

EXTENT OF USAGE:

1. On a daily basis	2. Occasionally - but more than once a week.	3. Rarely - or for emergency situations only.

LENGTH OF TIME OF ANTICIPATED EFFORT IN HOURS _____

SPECIAL WORK CONSIDERATIONS: (i.e., high places, temperature, hazardous material, protective clothing etc.,)_____

Safety Representative

PHYSICIAN'S EVALUATION for:_____

Employee

CLASS:		
I. No restrictions on respirator use.	2. Some specific use restrictions.	3. No respirator use permitted>
RESTRICTIONS:		

_____

_____

Examining physician

RPP -- APPENDIX - C1

User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece 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 facepiece 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 facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

RPP -- APPENDIX - C2

Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures--General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA- accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. 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.

5. 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 assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. 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.

6. 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

7. 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.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B- 1. 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.

9. 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, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he 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 her or his duties.

11. 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.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test 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 test.

13. 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.

14. Test Exercises. (a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:

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

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

(3) 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.

(4) 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).

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

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 shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) 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.

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

(b) 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.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall 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 is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

(a) Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) Three 1 liter glass jars with metal lids are required.

(2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.

(3) The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared 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. A new solution shall be prepared at least weekly.

(4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) The odor test solution is prepared 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. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.

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

(8) The following instruction shall be typed on a card and placed 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 concen tration. The two bottles in front of you contain water. One of these bottles also contains 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) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(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 shall 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, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.

(2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

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

(4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(5) Upon entering the test chamber, the test subject shall be given 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. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow two 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 his/her 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 failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated 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, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

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

(1) During threshold screening as well as during fit testing, subjects shall 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 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 shall 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 shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

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

(11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and 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, he/she may be unable to taste the weak saccharin solution.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

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

(14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four 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 described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed 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. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

(11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (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. BitrexTM (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The BitrexTM (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste Threshold Screening.

The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects shall 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 shall 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 #14 and #15 combined, is adequate.

(2) The test enclosure shall 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 shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

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

(11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

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

(14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four 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 that described in 4 (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

(6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex..

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed 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, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

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

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.

(11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

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 respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Only stannic chloride smoke tubes shall be used for this protocol.

(3) No form of test enclosure or hood for the test subject shall be used.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall 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. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

(5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

(b) Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

(1) The test operator shall 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 shall 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 shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

(3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

(2) The test subject shall be instructed to keep his/her eyes closed.

(3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the faceseal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator. (4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

(6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

(7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke.
Failure to evoke a response shall void the fit test.

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

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be 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 employing 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 facepiece to quantify the respirator fit.

1. General

(a) The employer shall 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 shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

(1) Instrumentation. 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 shall be used for quantitative fit testing.

(2) Test chamber. The test chamber shall 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 shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

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

(4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.

(6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.

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

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

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.

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

(11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate or P100 series filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected 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, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.

(2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the
test environment.

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

(5) A stable test agent concentration shall be obtained prior to the actual start of testing.

(6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.

(7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined 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) The average test chamber concentration shall be calculated 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) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an 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 will also be considered to 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 taken to be 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 procedure is described in the following equation:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_6 + 1/ff_7 + 1/ff_8}$$

Where ff1, ff2, ff3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

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

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount TM) protocol

quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for 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 can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI 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 and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the
screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the respirator is fitted with a high-efficiency filter and that the sampling probe and line are properly attached to the facepiece.

(2) Instruct the person to be tested to don the respirator for five 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 individual shall already have been trained 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 leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.

(6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, 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.

(b) Portacount Test Instrument.

(1) The 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 is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada 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 his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as 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 facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) CNP Fit Test Requirements.

(1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.

(2) The CNP system defaults selected for test pressure shall be set at--1.5 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall 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 shall be thoroughly trained to perform the test.

(4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

(5) The test subject shall be trained to hold his or her breath for at least 20 seconds.

(6) The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.

(7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

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

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

(3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall 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 head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold 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 shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.

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

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

(7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted 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 shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, 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 a respirator shall be tried.

(c) CNP Test Instrument.

(1) The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test

subject may be refitted and retested.

(2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or

2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

RPP -- APPENDIX - C3

Fit Testing Worksheet

DOCUMENTATION OF RESPIRATOR FIT TESTING

NAME OF EMPLOYEE	S.S. NO.	DATE

FIT TESTING; COMPETENT PERSON	TYPE OF FIT TEST _	TYPE OF TEST ATMOSPHERE:

1. INITAL PREPARATION	SATISFACTORY	UNSATISFACTORY
DONNING		
ADJUSTMENT		
2. NORMAL ATMOSPHERE		
POSITIVE PRESSURE TEST		
NEGATIVE PRESSURE TEST		
3. TEST ATMOSPHERE		
POSITIVE PRESSURE TEST		
NEGATIVE PRESSURE TEST		
4. SIMULATED MOVEMENTS		
THE RESULTS OF THIS TEST:		

THIS EMPLOYEE CAN BE ISSUED A RESPIRATOR:	TYPE	SIZE

AND HAS BEEN TRAINED IN DONNING, ADJUSTING, REMOVAL, INSPECTION, CLEANING AND PROPER STORAGE.

SIGNATURE OF EMPLOYEE	DATE:

NOTES:

RPP -- APPENDIX - D1

Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces 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 deg. C [110 deg. 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 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

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

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in 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 facepiece, replacing filters, cartridges, and canisters where necessary.

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

RPP -- APPENDIX E1

GENERAL RESPIRATOR INSPECTION

Respirator Model and S/N	Date	Inspectors Name

DEFECTS FOUND:

a. Facepiece	
b. Inhalation Valve	
c. Exhalation Valve Assembly	
d. Headbands	
e. Cartridge Holder	
f. Cartridge/Canister	
g. Filter	
h. Harness Assembly	
I. Hose Assembly	
j. Speaking Diaphragm	
l. Connections	
m. Other defects	

OTHER NOTES OR OBSERVATIONS:

STANDARD OPERATING PROCEDURE-DISASSEMBLY, CLEANING AND MAINTENANCE

1. Remove cartridges, canisters of filters and all gaskets that are not affixed to seats. Visually inspect facepieces and parts; discard faulty items.

3. Remove all elastic headbands .

4. Remove exhalation valve cover.

5. Remove speaking diaphragm or speaking diaphragms-exhalation valve assembly, or pressure demand exhalation valve assembly.

6. Remove inhalation valves.

7. Wash, sanitize and rinse facepieces (see specific procedure for operation of washing equipment). (Maximum water temperature 140 EF optimum range 120E to 140 EF)

8. Dry masks (see specific procedures for drying).

9. Hand wipe facepieces, valves valve seats with damp, lint- free cloth to remove any soap or water residues, mold release powders or foreign materials not removed by washing.

10. Disassemble and hand clean the pressure demand and exhalation valve assembly, exercising care to avoid damage to the rubber diaphragm.

11. Visually inspect facepieces and all parts for deterioration distortation, or other faults that might affect the performance of the respirators

12. Replace any questionable obviously faulty parts or assemblies including rubber components that show weather checking when flexed or stretched, and distorted facepiece. Replace only with part specifically designed for the particular respirator

13. Reassemble mask and visually inspect completed assembly.

14. Install new or retested filters, cartridges or canisters.

15. Clean and apply fogproof material as per manufacturers instructions. (full facepiece only)

16. Install lens cover

17. Fogproof outside of lens cover

18. Quality assurance test each each completed unit (see specific procedure for QA test)

19. Individually seal each mask in a plastic bag

RPP -- APPENDIX E3

SCBA INSPECTION

Respirator Model and S/N	Date	Inspectors Name

Weekly checks YES NO	After each use.	Monthly
(____)(____) Cylinder pressure ok. (____)(____) Cylinder changed when less than full. (____)(____) Stored in case or storage rack as per manufacturer instructions.	(____)(____) Examine facepiece and breathing tube. (____)(____) Removed from service if defective parts found. (____)(____) Damaged parts replaced. (____)(____) Cleaned and sanitized, reassembled and inspected. (____)(____) Recorded.	(____)(____) Air tightness checked. (____)(____) Main line and by pass valves checked

ANY OTHER INSPECTION STEPS AS RECOMMENDED BY MANUFACTURER:

RPP -- APPENDIX F1

(Non-Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by 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 heed all instructions provided by 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 containing contaminants for which your respirator 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.

RPP -- APPENDIX F2

Apéndice D para la sección 1910.134 (Mandatorio)

Información Para los Empleados Que Usan los Respiradores Cuando No lo Exige el Reglamento o Norma Los respiradores son uno de los medios de protección adecuados contra los distintos productos químicos cuando se han seleccionado y utilizado adecuadamente. Se fomenta el uso del respirador para el bienestar y protección del empleado, aun cuando la concentración de los productos químicos esten por debajo de los valores límites de exposición establecidos. Sin embargo, el respirador puede causarle daño si no se mantiene limpio o se usa incorrectamente. Algunas veces los empleados usan los respiradores para evitar ser expuestos a los diferentes productos químicos, aunque estos no excedan los valores límites establecidos por los reglamentos de la Administración de Seguridad y Salud Ocupacional (OSHA). Si su patrono provee los respiradores para uso voluntario, o sí usted provee su propio respirador, necesita tomar ciertas precauciones para que se asegure que no corre riesgos cuando use el respirador.

Usted debe hacer lo siguiente:
1. Lea y haga caso a las instrucciones que provee el fabricante en el uso, mantenimiento, limpieza y cuidado, y las advertencias en cuanto a las limitaciones de los respiradores.

2. Escoja respiradores certificados contra los contaminantes que le interesa. La Institución Nacional para la Seguridad y Salud Ocupacional (NIOSH) del Departamento de Salud y Servicios Humanos de los Estados Unidos de América, son los que certifican los respiradores. Una etiqueta o certificado de exposición debe aparecer en el respirador o en el empaque del respirador. Este debe decirle para que químicos fue hecho y cuanto le va a protejer.

3. No use su respirador en átmosferas que contienen contaminantes para los cuales no fue diseñado porque no le va a proteger. Por ejemplo, si un respirador es diseñado para filtrar partículas de polvo no le va a proteger contra gases, vapores o partículas solidas de vaho (mal olor) o humo.

4. No pierda de vista su respirador para que así no use el respirador de otra persona por equivocación.

RPP -- APPENDIX G
DEFINITIONS

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) [Reserved]

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 combination of these items, which removes specific contaminants from the air passed through the container.

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

Emergency situation 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 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) 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. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

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 or 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.

Interior structural firefighting means 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. (See 29 CFR 1910.155)

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

Maximum use concentration (MUC) [Reserved].

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.

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

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory 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 fit test to assess the adequacy of respirator fit that relies on the 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.

This section means this respiratory protection standard.

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.