



**Occupational Health and Industrial Hygiene Program**

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# University of Wisconsin-Milwaukee

## Respiratory Protection Program

# Table of Contents

Contact Information.....	1
1. Introduction and Purpose.....	2
2. Glossary.....	2
2.1 Acronyms.....	2
2.2 Definitions.....	3
3. Scope and Application.....	4
4. Responsibilities.....	5
4.1 University Safety and Assurances (USA) .....	5
4.2 Supervisors (Managers, Principal Investigators (PIs), Lab Managers, etc.) .....	6
4.3 Respirator User.....	7
4.4 Physician or other Licensed Healthcare Professional (PLHCP) .....	7
5. Prerequisites.....	7
6. Respirator Selection.....	8
7. Medical Evaluations.....	8
8. Training.....	9
9. Respirator Fit Testing.....	10
10. Use and Care Information.....	11
10.1 Respirator Use.....	11
10.2 Limitations of Use.....	13
10.3 Respirator Inspection, Maintenance, Cleaning, and Storage Procedures.....	13
11. Program Evaluation.....	15
Appendix A: Respiratory Protection Process Decision Analysis/Flow Chart.....	17
Appendix B: Department Specific Information.....	18

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**1. Introduction and Purpose**

University of Wisconsin-Milwaukee (UWM) strives to eliminate potential inhalation exposures to hazardous materials and atmospheres whenever possible. In cases where the elimination of an inhalation hazard is not possible, appropriate engineering controls shall be used when available and safe work practices shall be implemented. Respirators shall only be used as the principal means of control in situations where neither hazard elimination, substitution, nor engineering controls are feasible or effective. Additionally, respirator use may be recommended by a personal physician as an additional precaution to prevent exposure due to individual susceptibility.

The Occupational Safety and Health Administration's (OSHA) Respiratory Protection Standard (29 CFR 1910.134), requires that a written Respiratory Protection Program (RPP) be established if respirator use is required to protect the health of personnel.

The purpose of the UWM RPP is to meet all the regulatory requirements of the OSHA Respiratory Protection Standard and most importantly to provide respirator users with a resource to ensure proper and effective respirator use. Requirements of the OSHA Respiratory Protection Standard include a description of medical evaluation process, training, respirator fit testing, and selection, inspection, maintenance, use, cleaning, and storage of respirators.

## 2. Glossary

### 2.1 Acronyms

- **APF** – Assigned Protection Factor
- **APR** – Air-purifying Respirator
- **ESLI** – End of Service Life Indicator
- **HEPA** – High Efficiency Particulate Air [Filter]
- **IDLH** – Immediately Dangerous to Life and Health
- **MUC** – Maximum Use Concentration
- **NIOSH** – National Institute for Occupational Safety and Health
- **OHIHPM** – Occupational Health and Industrial Hygiene Program Manager
- **OSHA** – Occupational Safety and Health Administration
- **PAPR** – Powered Air-Purifying Respirator
- **PI** – Principal Investigator
- **PLHCP** – Physician or other Licensed Healthcare Professional
- **QLFT** – Qualitative Fit Test
- **QNFT** – Quantitative Fit Test
- **RMEQ** – Respirator Medical Evaluation Questionnaire
- **RPP** – Respiratory Protection Program
- **RPPA** – Respiratory Protection Program Administrator
- **SAR** – Supplied Air Respirator/Airline Respirator
- **SCBA** – Self-contained Breathing Apparatus
- **SOP** – Standard Operating Procedure
- **USA** – University Safety and Assurances
- **UWM** – University of Wisconsin-Milwaukee

### 2.2 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)** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.
- **Atmosphere-supplying respirator** 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.
- **Loose-fitting facepiece** means a respiratory inlet covering that is designed to form a partial seal with the face.
- **Maximum use concentration (MUC)** means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

- **Negative pressure respirator (tight fitting)** 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 1910.134(e)
- **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.
- **Required Use** means the use of respirators in atmospheres with air contaminants known to be above allowable levels or where a supervisor has otherwise determined respirator use to be mandatory. Failure to use a respirator where required should subject an employee to discipline.
- **Respiratory inlet covering** means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.
- **Self-contained breathing apparatus (SCBA)** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- **Service life** means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.
- **Supplied-air respirator (SAR) or airline respirator** means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- **Tight-fitting facepiece** means a respiratory inlet covering that forms a complete seal with the face.
- **User seal check** means an action conducted by the respirator user to determine if the respirator is properly seated to the face.
- **Voluntary use** means the use of a respirator in atmospheres which are not known to have levels of air contaminants known to impact health.

### 3. Scope and Application

The requirements of the RPP apply to all UWM personnel required to wear a respirator. A respirator is considered required if;

- A hazard assessment indicates that an inhalation hazard or hazardous atmosphere exists that requires respiratory protection, or
- A job description or a standard or emergency operating procedure requires a respirator to be worn.

The RPP also covers the emergency use of respirators.

Any respirator use that does not meet either of these criteria is designated as voluntary use. Voluntary use of disposable filtering facepiece respirators does not require compliance with the RPP. However, voluntary respirator use should be reviewed by University Safety and Assurances (USA) and Appendix D of the OSHA Respiratory Protection Standard must be provided to the respirator user. Additionally, voluntary users of tight-fitting, full- or half-facepiece respirators and powered air-purifying respirators (PAPRs) must be reviewed by USA's OHIHPM and meet RPP requirements for medical evaluations. Furthermore, voluntary users of any type of respirator must understand how to inspect, clean, store, and maintain the respirator to ensure it does not itself present a health hazard.

The RPP does not apply to any contractors required to wear respirators as part of work performed on UWM property, on behalf of UWM-sponsored projects. The contractor's employees shall be enrolled in the contractor's own written respiratory protection program in accordance with OSHA's Respiratory Protection Standard and other applicable state and federal regulations.

#### **4. Responsibilities**

##### **4.1 University Safety and Assurances (USA)**

USA's Occupational Health and Industrial Hygiene Program Manager (OHIHPM), is designated as the Respiratory Protection Program Administrator (RPPA) and is responsible for both the daily administration and periodic evaluations of the RPP. The OHIHPM may, in consultation with the Associate Director of USA, delegate all or part of the RPPA's responsibilities to allow for a more effective respirator program managed at the departmental level, which include:

- Prepare and manage all necessary RPP program documentation including; the written program, forms, training materials, etc.
- Conduct a comprehensive review of the Respiratory Protection Program as needed to ensure program effectiveness.
- Inform supervisors, physicians or other licensed healthcare professionals (PLHCP), and other affected personnel of any changes to the RPP. Conduct hazard assessments to determine the type of respirator required and the appropriate respirator filters/cartridges to be used. Maintain any air-sampling results conducted as part of these assessments.
- Develop and provide access to respiratory protection training and informational resources and maintain all training records associated with the RPP.
- Provide annual respirator fit testing to personnel required to wear any tight-fitting respirator, using OSHA-accepted protocols. Maintain all required fit test records. Maintain/manage all equipment associated with respirator fit testing. Provide respirator fit testing to voluntary users as requested.
- Maintain and provide the Respirator Medical Evaluation Questionnaire (RMEQ) for use in the medical evaluations of personnel required to wear a respirator or voluntarily use a tight-fitting full- or half-facepiece respirator or PAPR.

- Provide the PLHCP with a copy of OSHA's Respiratory Protection Standard and the current version of the RPP.
- Review respirator usage on a continual basis to ensure respirators are suitable for the purpose intended.
- Review and approve any written emergency procedures involving respirator use.
- Provide additional technical support and regulatory guidance regarding respiratory protection to students, faculty, and staff as needed.

#### **4.2 Supervisors (Managers, Principal Investigators (PIs), Lab Managers, etc.)**

- Serve as the RPPA at the departmental level.
- Ensure that any personnel who are required to wear a respirator or voluntarily use a tight-fitting elastomeric respirator or PAPR, participate in the RPP and are fulfilling all applicable program requirements.
- Provide appropriate respirators to personnel required to wear a respirator at no cost the user.
- Inform USA's OHIHPM regarding any voluntary use of disposable filtering facepiece respirators and ensure the respirator user is provided with information on the use and limitations of disposable filtering facepiece respirators (dust masks) including the information from Appendix D of OSHA's Respiratory Protection Standard.
- Request assistance from USA's OHIHPM in evaluating new operations that may present health and safety hazards. Eliminate hazardous materials or use engineering controls whenever feasible.
- Contact USA's OHIHPM at least 2 months in advance to arrange for respirator fit testing of large groups of respirator users.
- Ensure that the training profile for personnel required to use respirators includes a requirement for respiratory protection training.
- Assist potential respirator users in the process of obtaining medical clearance, training, respirator fit testing, and respirator procurement.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when required.
- Ensuring that respirators are properly cleaned, maintained, inspected, and stored according to the respiratory protection plan and/or manufacturer's instructions.
- Ensuring that respirators fit well and do not cause discomfort.
- Continually monitoring work areas and operations to identify respiratory hazards.
- Coordinate with USA's OHIHPM on how to address respiratory hazards or other concerns regarding the program.
- Update their departments program as needed

#### **4.3 Respirator User**

- Comply with all the applicable requirements of the RPP.



- Personnel required to wear a respirator, or voluntarily using a respirator other than a disposable filtering facepiece, must obtain medical clearance by completing and submitting the RMEQ to UWM's Occupational Health Provider.
- Use the correct respirator when and where required in the way they were trained.
- Care for and maintain their respirators as instructed, and store them in a clean, sanitary location.
- Inform your supervisor of any change in materials, processes, or work environment that potentially affects the type or seriousness of inhalation hazards or any other aspect of respirator use.
- Inform their supervisor if the respirator no longer fits well and request a respirator fit test for an alternative respirator.
- Inform their supervisor and USA's OHIHPM of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the RPP.
- Inform your supervisor of any symptoms or other indications that exposure to an inhalation hazard may be occurring (odors, tastes, irritation, exposure symptoms, etc.)
- Inform your supervisor and USA's OHIHPM of any personal health problems that could be aggravated by using respiratory protection equipment.
- Inform your supervisor of conditions such as sudden weight-loss or gain, extensive dental work, cosmetic surgery, facial scarring, etc. that may affect respirator fit.
- Inform their supervisor of need for a medical reevaluation due to any changes in health condition.
- Inform your supervisor and USA's OHIHPM of any intended voluntary use of a respirator.

#### **4.4 Physician or other Licensed Health Care Provider (PLHCP)**

- Conduct medical evaluations in accordance with 29 CFR 1910.134(e) to determine the respirator user's fitness to wear a respirator.
- Provide a copy of the respirator medical clearance report to USA's OHIHPM, including any limitations on respirator use and special requirements for additional medical evaluations.
- Maintain medical records associated with the evaluation including the RMEQ and the results of any medical examinations and testing, if applicable.

### **5. Prerequisites**

Consultation with USA's OHIHPM for hazard assessment, respirator selection, medical evaluations, personnel training, and respirator fit testing are prerequisites that must be successfully completed prior to any required respirator use.

### **6. Respirator Selection**

The selection of any respirator for required use must be based on a hazard assessment, written Standard Operation Procedure (SOP), or job description based on such an assessment. USA's OHIHPM is

responsible for making the final determination of what type of respirator is appropriate for a task or process, including appropriate filters/cartridges when applicable. These determinations may be based on assessments conducted by USA's OHIHPM or upon a review of assessments conducted by other qualified personnel. Exposure assessments by personal breathing zone sampling may be conducted where required. The hazard assessment and selection process for respirators considers the following:

- Chemical and physical form of the contaminant/characteristics of the atmosphere (oxygen content, etc.)
- The level of exposure with respect to the applicable occupational exposure limit
- Characteristics of the operation, processes, and job tasks
- Location of the hazardous area
- Frequency and length of time for which respiratory protection would be needed
- Personnel activity level in the hazardous area
- Physical characteristics, capabilities, and limitations of the respirator

Only National Institute for Occupational Safety and Health (NIOSH) certified respirators are to be selected. USA's OHIHPM shall inform the supervisor of the appropriate type of respiratory protection required for each task or process. Respirator requirements for any new or revised tasks or processes shall be determined based upon an additional hazard assessment.

Voluntary use of a disposable filtering facepiece respirator (dust mask) does not require an assessment by USA's OHIHPM. However, USA's OHIHPM must be informed of the intended use. The supervisor must ensure that the respirator user is provided with information on the use and limitations of disposable filtering facepiece respirators (dust masks) as well as Appendix D of OSHA's Respiratory Protection Standard.

Voluntary use of tight-fitting, full- and half-facepiece respirators and PAPRs must be reviewed by USA's OHIHPM to ensure medical clearance of personnel and the respirator user must be provided information on the use, care, and limitations of the respirator as well as Appendix D of OSHA's Respiratory Protection Standard.

## **7. Medical Evaluations**

Using a respirator may place a physiological burden on personnel that varies with the type of respirator worn, the job task and workplace conditions in which the respirator is used, and the medical status of the individual. Personnel required to use any type of respirator or choose to voluntarily use a respirator other than a disposable filtering facepiece (dust mask) must complete and submit a Respirator Medical Evaluation Questionnaire (RMEQ) to Ascension Columbia St. Mary's CorporateWORx, UWM's Occupational Health Provider.

The RMEQ is available from USA's OHIHPM or can be found on USA's webpage. The RMEQ includes questions regarding individual medical history as well as the type of respirator and conditions of use. Therefore, respirator selection must occur prior to completion of the RMEQ. Medical clearance from a Physician or other licensed healthcare professional (PLHCP) of UWM's Occupational Health Provider is required prior to respirator fit testing and respirator use.

Upon review of the RMEQ, the PLHCP may require an onsite medical evaluation. The PLHCP will determine the need and frequency of any additional medical evaluations. Supervisors and personnel are responsible for scheduling appointments required by the PLHCP.

Upon completion of the medical evaluation, the PLHCP shall provide the respirator user and USA's OHIHPM with a copy of the medical clearance report. The medical clearance report will state if the individual meets the physical requirements to wear the type of respiratory protection under the conditions described. In some cases, the medical clearance report may include restrictions on respirator use or prohibit the use of a respirator by an individual due to the risk of adverse health effects. Those individuals who do not meet the physical requirements cannot wear a respirator. These individuals cannot perform the specified task unless the inhalation hazard is eliminated, engineering controls mitigate the hazard to levels below the applicable occupational exposure limit, or the individual's health status or work conditions change and the PLHCP provides written medical clearance.

Supervisors shall inform USA's OHIHPM if there are any changes to the process, environment, or other conditions of use. The respirator user shall report to their supervisor and USA's OHIHPM any changes in health status that could affect the appropriateness of respirator use as well as any symptoms that may indicate the need for a medical evaluation. Additional medical evaluations are required under certain circumstances:

- The respirator user reports medical signs or symptoms related to the ability to use a respirator.
- The PLHCP, USA's OHIHPM, supervisor, or respirator user recommends reevaluation.
- A change occurs in workplace conditions that may substantially increase the physiological burden for a respirator user.

Medical records are retained by UWM's Occupational Health Provider. A copy of the PLHCP's respirator medical clearance report is retained by USA and should also be retained by the respirator user.

Medical evaluations are provided at no cost to the respirator user. Any charges for the medical evaluation or medical testing will be the responsibility of the respirator user's department.

## **8. Training**

All personnel required to use a respirator must successfully complete respirator training prior to using the respirator. In-person training will be conducted during the respirator fit test by USA's OHIHPM. Additionally, the supervisor may assign the training as part of the respirator user's training profile. The training must be completed at least annually or when operational changes or poor compliance with the requirements of the RPP indicate the need for additional training. The training includes information on the following topics:

- Prerequisites for using a respirator including medical clearance and respirator fit testing.
- 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 inspect, don (put on) and doff (take off), and perform seal checks of the respirator.
- What the procedures are for cleaning, maintenance, and storage of the respirator.

USA's OHIHPM is responsible for the training development and maintenance of training records.

For voluntary use of respirators, if individuals do not have a respirator fit test performed by USA's OHIHPM it is recommended that they review the training available on USA's webpage. Appendix D of the OSHA Respiratory Protection Standard must be provided to voluntary respirator users.

## **9. Respirator Fit Testing**

Personnel required to wear any tight-fitting respirator, including disposable filtering facepiece respirators, must successfully complete a respirator fit test prior to using the respirator and annually thereafter. USA's OHIHPM provides respirator fit testing for all personnel required to use a respirator, and upon request for voluntary respirator users. Quantitative respirator fit testing using a TSI Portacount setup for the 29 CFR 1910.134 Protocol is the standard method used, but qualitative respirator fit testing methods are also available when needed. Individual respirator users or department supervisors with multiple respirator users can schedule respirator fit tests through USA's OHIHPM. Supervisors must contact USA's OHIHPM to arrange for respirator fit testing of larger groups at least 2 months in advance.

Before a respirator fit test can be performed the following conditions must be met:

- A copy of the individual's medical clearance report must be provided to USA's OHIHPM.
- The user must not have clothing or facial hair that interferes with the respirator seal at the time of the respirator fit test.
- The user must demonstrate proper inspection, donning (putting on), and user seal check(s) for the specific respirator.

USA has a set of respirators for respirator fit testing. If a respirator fit test has not yet been conducted, supervisors or users should contact USA's OHIHPM before purchasing any tight-fitting respirators. Supervisors or users must notify USA's OHIHPM if a specific manufacturer and model of respirator is preferred. If the individual or department has a preference, it is the responsibility of the supervisor or user to provide the respirator for the respirator fit test. Special adapter kits, specific to the respirator manufacturer, are often required to perform the respirator fit test and may not be immediately available. USA's OHIHPM can make respirator recommendations based upon those respirators for which adapter kits are readily available.

Upon successfully completing a respirator fit test the user will be provided with a Respirator Fit Test Card that includes the respirator fit test expiration date as well as the manufacturer, model, and size of respirator that they were fitted for. USA retains records of all individuals who have successfully completed a respirator fit test.

Individuals who are unable to successfully complete a respirator fit test of any tight-fitting respirator may use a loose-fitting PAPR if it is determined by USA's OHIHPM that it provides adequate protection for the intended use and the user has obtained medical clearance for a PAPR.

## **10. Use and Care Information**

### **10.1 Respirator Use**

All respirator users must inspect and perform user seal checks for their respirator each time they don it. They shall use the appropriate procedures for the type of respirator they are wearing, per the manufacturer's instructions.

General, non-manufacturer specific, user seal check procedures for tight-fitting half- and full-facepiece respirators consist of the following:

- 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.
- 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.

The respirator shall not be removed while in the required respirator use area.

If glasses, goggles, a face shield, or a welding helmet must be worn when using a respirator, they shall be worn in a manner that will not interfere with the face seal.

Personnel wearing respirators where an inhalation hazard is present must immediately leave the required respirator use area for the following reasons:

- A respirator user experiences any symptoms such difficulty breathing, dizziness, nausea, or any other adverse health effects including those that may be caused by exposure to the inhalation hazard.
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the

facepiece. Note: Contaminant warning properties include odor, taste, and irritation.

- To replace the respirator, filter, or chemical cartridges or to remove the respirator.
- If during respirator use a change occurs in work conditions that could result in higher air contaminant levels or a hazardous atmosphere which the respirator would no longer be appropriate.

If a respirator user experiences any symptoms such as difficulty breathing, dizziness, nausea etc., they shall immediately leave the area where the inhalation hazard or hazardous atmosphere exists and notify their supervisor and USA's OHIHPM.

Supervisors shall inform USA's OHIHPM of any changes in materials, processes, or environmental conditions where respirators are required that could potentially increase either the inhalation hazard or potential stress of the respirator uses.

Disposable respirators shall not be shared. Disposable respirators shall not be used for more than one shift. If used to protect the user from a biohazard, disposable respirators must be discarded immediately after removing the respirator after exiting the required respirator use area.

Chemical cartridges shall be changed out at the frequency established by the manufacturer's end-of-service life indicator; when they become physically damaged; when warning properties such as odor, taste, or irritation indicate breakthrough; or by USA's OHIHPM. Change out schedules for chemical cartridges are established based on the type of contaminant, contaminant concentration, humidity, temperature, atmospheric pressure, and work rate. In the absence of a specific change out schedule, chemical cartridges shall be changed at the end of each shift requiring respirator use. OSHA has established mandatory change out schedules for substances including acrylonitrile, benzene, butadiene, formaldehyde, and vinyl chloride.

Filters must be replaced when they become loaded or damaged. This may be indicated by increased breathing resistance with filters; visual observation of defect; or a noticeable odor, taste, or irritation. Respirator filters/chemical cartridges cannot be cleaned and reused.

Entry into an Immediately Dangerous to Life and Health (IDLH) or oxygen deficient atmosphere is not permitted for any UWM personnel unless written procedures, reviewed and approved by USA's OHIHPM, have been developed and implemented.

Only SCBAs or supplied air respirators (SARs) with an emergency escape SCBA operated in pressure demand mode shall be used to enter areas with unknown hazardous air contaminant concentrations; oxygen-deficient atmosphere; or atmospheres considered Immediately Dangerous to Life and Health (IDLH). Use of an SCBA or SAR requires specific, written procedures reviewed and approved by USA's OHIHPM. These procedures shall include maintenance, instructions and conditions of use.

## **10.2 Limitations of Use**

Personnel required to use a respirator are only allowed to wear the specific manufacturer, model, and size of respirator for which they have medical clearance and a valid respirator fit test for; are properly trained; and its use for a specific hazard type has been approved by USA's OHIHPM. When applicable, the appropriate change-out schedule for chemical cartridges and filters must be followed.

Air-purifying respirators shall not be used under the following conditions:

- Immediately Dangerous to Life and Health (IDLH) atmospheres.
- Oxygen-deficient atmospheres (less than 19.5% oxygen).
- Situations where contaminants lack sufficient warning properties.
- Atmospheres containing unknown contaminants or concentrations.
- Atmospheres containing contaminant concentrations exceeding the MUC of the respirator or cartridge.
- Atmospheres containing contaminant types not appropriate for the chemical cartridge or filter.
- Chemical cartridges have expired or exceeded their useful life per the cartridge change out schedule

Respirators shall not be worn when conditions prevent a good facepiece-to-face seal or interfere with valve function. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the facepiece, temple pieces on glasses, goggles or other personal protective equipment, or the absence of one or both dentures.

### **10.3 Respirator Inspection, Maintenance, Cleaning, and Storage Procedures**

All respirators must be inspected prior to use. Only respirators designated as reusable by the manufacturer shall be inspected, cleaned, and stored after use. Reusable, elastomeric facepiece respirators and PAPRs shall be inspected after each use, cleaned and sanitized according to manufacturer's instructions as needed.

Although sharing respirators is not recommended, reusable, elastomeric respirators and PAPRs that are shared by multiple users shall be inspected, cleaned, and sanitized after each use, according to manufacturer's instructions. Shared respirators must also be inspected and sanitized prior to each use. Anyone cleaning or sanitizing a respirator must follow manufacturer's instructions, ensure that any cleaners and sanitizers are not expired, and do not degrade respirator parts and materials.

General, non-manufacturer specific, inspection procedures for reusable elastomeric respirators consist of the following:

- Examine the elastomeric portion of the facepiece for rips, tears, holes, deformations, cracks, stiffening, signs of aging, or residue.
- Inspect head straps and harness for breaks, cuts, frays, tears, loss of elasticity and missing or damaged hardware.
- Check filter inlets to verify proper condition of threads/fittings.

- Examine the inhalation and exhalation valves and valve seats for cracks or foreign substances which may not allow the valves to close completely. Verify that the valves are not distorted or missing and that valves have not become stiffened, distorted, or decomposed.
- Inspect the lens on full-facepiece respirator for cracks, excessive scratches, or other damage.
- Ensure that filters/cartridges have not past the manufacturer's expiration date or exceeded their useful life as described in your respirator program's change-out schedule.
- Check the rubber gaskets to ensure they are not distorted or show signs of any cuts, cracks or scratches.

General, non-manufacturer specific, inspection procedures for PAPRs consist of the following:

- Check the cover and filter.
- Check that the filter gasket is clean, in good condition, and properly installed. If not, do not use the PAPR until a replacement gasket can be installed per manufacturer *Instructions*.
- Examine the blower housing for cracks or warping.
- Check that the battery latch is properly installed.
- Examine the inside of the blower housing and fan assembly. The presence of dust or other particulate matter inside the blower may indicate a damaged filter or improper seating of the filter/cartridge to the gasket. Contact manufacturer for assistance.
- Examine the outside of the battery for cracks. Replace if damaged.
- Inspect the breathing tube and replace if punctured, cracked or worn.
- Bend the breathing tube to verify that it is flexible.
- Successfully complete user seal checks according to the manufacturer's instructions.

No modifications, such as decorating or painting, can be made to any respirator. Remove any damaged respirators from the work area and mark them as "not for use" or "damaged". If they cannot be repaired, respirators must be discarded and replaced.

Replacement parts shall be those specified by the manufacturer. When required by the manufacturer, only certified individuals are to perform maintenance and repairs.

Monthly inspections of SCBAs shall be documented. SCBAs shall be recharged when the pressure falls to 90 percent of the manufacturer's recommended pressure level. Only certified Grade D (ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989) breathing air shall be used to fill SCBAs. Only cylinders with a current hydrostatic test date and no signs of damage shall be filled.

General, non-manufacturer specific, cleaning procedures for reusable elastomeric respirators consist of the following:

- 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.



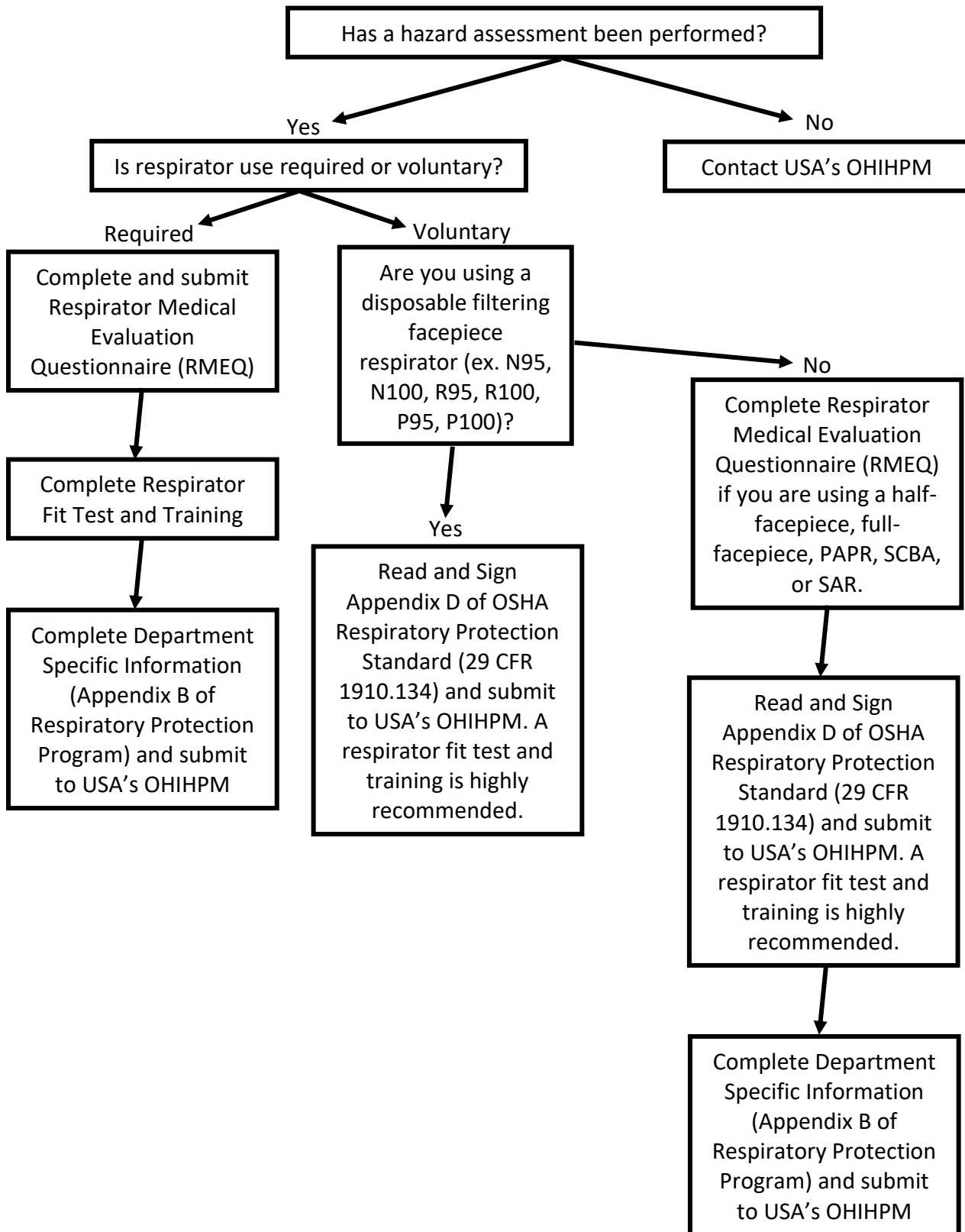
- Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
  - 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,
  - 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,
  - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- 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.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to ensure that all components work properly.

Respirators shall be stored in a clean, dry environment away sources of contamination, direct sunlight, extreme heat or cold, and damaging chemicals. After cleaning and when completely dry, store respirators in a rigid, closable container or box and plastic bag to minimize the risk of contamination and damage. Store respirators so that the facepiece, straps, and valves are not distorted or damaged. Keep opened filters/cartridges in an air-tight resealable plastic bag with the respirator. Ensure that the date the filters/cartridges were opened and removed from their original packaging is written on the filters/cartridges themselves.

## **11. Program Evaluation**

The RPPA or designee will conduct evaluations of the RPP as needed. These evaluations shall address training, hazard assessment and respirator selection, medical evaluations, respirator fit testing, respirator use, maintenance, and storage. Evaluation methods will include observation of behavior associated with respirator use, consults with supervisors and respirator users, review of records and program documentation, and targeted inspections/audits. Any deficiencies noted during these evaluations shall be corrected by responsible parties. Any changes in the program will be communicated to all affected personnel.

**Appendix A: Respiratory Protection Process Decision Analysis/Flow Chart**



**Appendix B: Department Specific Information**

Date: [MM/DD/YYYY]  
 Division/Department: [Division/Department]  
 Department Respiratory Protection Program Administrator (RPPA): [Name]

**Chemical Cartridge Change Out Schedule (if applicable)**  
 Ex. Organic vapor cartridges will be discarded and replaced after 8 hours of use or 1 week, whichever comes first.

**Table 1: Hazard Assessment**

Job Task and Location	Inhalation Hazard	Exposure Level	Occupational Exposure Limit (if applicable)	Respirator Needed	Usage Type (Required or Voluntary)
Ex. Animal Surgery in Lapham Bldg. Room 31	Isoflurane	4 PPM	2 ppm (NIOSH REL)	Half-facepiece APR with Organic Vapor Chemical Cartridges	Required

**Table 2: Authorized Respirator Users**

Name	Respirator Medical Clearance Date	Respirator Medical Clearance Expiration Date	Respirator Fit Test Date	Respirator Training Date	Type(s) of Respirators Used (Make, Model, Size, Type)
Ex. John Doe	01/01/2019	N/A	01/10/2019	01/10/2019	3M 6300 (Large) Half-facepiece APR