



**WAYNE STATE
UNIVERSITY**

RESPIRATORY PROTECTION PROGRAM

Per OSHA 29 CFR 1910.134 and MIOsha Part 451
Respiratory Protection Standard

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PREPARED BY:

The Office of Environmental Health and Safety
Wayne State University
5425 Woodward Ave, Suite 300
Detroit, MI 48202

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INTRODUCTION

PURPOSE

The purpose of this Respiratory Protection Program (RPP) is to establish and implement comprehensive procedures to protect employees from the adverse health effects of exposure to airborne contaminants. Wayne State University (WSU) is committed to providing a safe and healthy working environment and prioritizes the elimination and control of respiratory hazards through engineering and administrative controls whenever feasible. Respiratory protection equipment (respirators) will be used only as a supplemental measure when engineering and administrative controls are not feasible, are being implemented, or in emergency situations.

SCOPE

The RPP applies to all WSU employees and outlines the responsibilities of both the University and its employees regarding respiratory protection. While the University is responsible for establishing and maintaining a comprehensive program, providing appropriate equipment, and ensuring proper training, all employees have a responsibility to adhere to the procedures outlined in this program, use respirators correctly when required, and report any concerns or issues related to respiratory protection.

This program defines the proper selection, use, maintenance, and training associated with respiratory protection to minimize employee exposure to airborne contaminants. All employees required to use respirators must adhere to the procedures outlined in this program. This program is established in accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.134, Respiratory Protection Standard, and the Michigan Occupational Safety and Health Administration (MIOSHA) Part 451, Respiratory Protection Standard, which incorporates by reference the federal regulations. This program is designed to:

- Prevent occupational illnesses and injuries resulting from inhalation of hazardous substances.
- Define the roles and responsibilities of all parties involved in respiratory protection, including management, supervisors, employees, and support services.
- Establish criteria for the identification, evaluation, and control of respiratory hazards in all University workplaces.
- Provide guidance on the selection, fit testing, use, maintenance, and storage of appropriate respiratory protection equipment.
- Reinforce that engineering and administrative controls are the primary means of controlling respiratory hazards, with respirators used as a secondary or temporary means of protection.
- Provide comprehensive training and education to all employees required to use respirators, ensuring they understand the proper use, limitations, and maintenance of such equipment.
- Establish procedures for medical evaluations to determine employees' ability to use respirators safely.
- Maintain accurate records of hazard assessments, medical evaluations, fit testing, training, and respirator maintenance.

RESPONSIBILITIES

OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY (OEHS)

- The Director of OEHS has the ultimate responsibility for the RPP within the university.
- Developing, reviewing, and updating the written RPP to ensure compliance with applicable regulations (OSHA, MIOSHA) and best practices.
- Conducting or overseeing workplace hazard assessments to identify potential respiratory hazards and determine the need for respiratory protection. This includes air monitoring, process reviews, and chemical inventories.
- Assist with the development and implementation of appropriate control measures and safe work practices.

- Establishing criteria for selecting appropriate respirators based on the identified hazards, ensuring NIOSH approval, and maintaining a list of approved respirators.
- Coordinating with occupational health providers to ensure that employees required to use respirators receive appropriate medical evaluations and clearances.
- Conducting or overseeing fit testing of employees to ensure proper respirator fit and seal. This includes training fit testers and maintaining fit test records.
- Developing and delivering comprehensive training programs for employees on the proper use, care, maintenance, and limitations of respirators.
- Maintaining accurate records of hazard assessments, medical evaluations, fit testing, training, respirator maintenance, and other program-related documentation.
- Regularly evaluating the effectiveness of the Respiratory Protection Program and making necessary revisions.
- Providing guidance and support to departments and supervisors on all aspects of respiratory protection.
- Ensuring compliance with all applicable federal, state, and local regulations related to respiratory protection.
- Approve the purchase, storage, and inventory of respirators and related equipment for WSU.

DEPARTMENT MANAGER/SUPERVISOR

- Ensuring that employees under their supervision comply with all requirements of the RPP.
- Communicating information about respiratory hazards to their employees.
- Ensuring that employees use respirators correctly when required and that they are properly trained and fit tested by OEHS.
- Providing necessary resources, including respirators, cleaning supplies, and storage facilities, to support the program.
- Reporting any concerns or issues related to respiratory protection to OEHS.
- Monitoring workplace conditions to ensure that respiratory hazards are properly controlled and that respirators are being used correctly.
- Observing employees during respirator use to ensure they are using them correctly and that the respirators are functioning properly.
- Addressing employee questions and concerns related to respiratory protection.
- Notify OEHS of new employees for program enrollment.

WSU EMPLOYEES, STUDENTS, VOLUNTEERS, AND VISITORS

- Using respirators in accordance with training and instructions provided by OEHS and their supervisors.
- Inspecting respirators before each use to ensure they are in good working condition.
- Cleaning, disinfecting, and storing respirators properly as instructed.
- Reporting any problems with respirators or respiratory hazards to their supervisor or OEHS.
- Attending and actively participating in required respiratory protection training.
- Participating in medical evaluations and fit testing as required.
- Following established workplace procedures related to respiratory protection.
- Asking questions if they have any concerns or do not understand any aspect of the program.
- Employees are responsible for informing their supervisor and OEHS of any changes in their medical condition that could affect their ability to use a respirator.

HAZARD ASSESSMENT

In coordination with the WSU Industrial Hygiene Program, a comprehensive hazard assessment will be conducted to identify potential respiratory hazards in all areas where employees may be exposed. This assessment will be a dynamic process, revisited whenever new processes, chemicals, or equipment are introduced, or when employee complaints or incidents suggest a potential hazard. The following methods will be used:

- **Chemical Inventory and Safety Data Sheet (SDS) Review:** A comprehensive and up-to-date inventory of all chemicals used, stored, or generated in the workplace will be maintained. This inventory will be readily accessible to employees and will include crucial information such as chemical names, CAS numbers, and quantities. SDS for each chemical will be meticulously reviewed by trained personnel to identify potential respiratory hazards. This review will specifically focus on:
 - Identifying Permissible Exposure Limits (PELs) set by OSHA, Threshold Limit Values (TLVs) recommended by the ACGIH, and any other relevant exposure limits.
 - Determining if inhalation is a significant route of exposure.
 - Identifying potential health effects from inhalation, including acute effects (e.g., irritation, dizziness) and chronic effects (e.g., lung damage, cancer).
 - Reviewing recommended control measures outlined in the SDS, including engineering controls, administrative controls, and personal protective equipment.
- **Audits and Inspection:** Regular and systematic audits and inspections will be conducted by OEHS, including departmental representatives, supervisors, and employees, to identify potential sources of respiratory hazards. These inspections will:
 - Be conducted at regular intervals (e.g., monthly, quarterly) and whenever new processes or equipment are introduced.
 - Cover all areas where employees may be exposed to respiratory hazards, including laboratories, workshops, animal facilities, maintenance areas, and storage areas.
 - Include observation of work processes, equipment, ventilation systems, housekeeping practices, and environmental conditions (e.g., dust accumulation, visible fumes).
 - Be documented, including the date of the inspection, areas inspected, identified hazards, and recommended corrective actions.
- **Exposure Assessments:** Air sampling and monitoring will be conducted under the following circumstances:
 - When there is reason to believe that employee exposures may exceed established exposure limits (PELs, TLVs, etc.).
 - When required by specific MIOSHA standards (e.g., asbestos, lead).
 - When evaluating the effectiveness of engineering controls.
 - Following employee complaints or reports of potential overexposures.
 - Air sampling and/or monitoring will be performed by OEHS under the supervision of a Certified Industrial Hygienist. OEHS will ensure all exposure assessments will be performed using appropriate sampling methods and calibrated equipment. Samples will be analyzed by a certified laboratory, and results will be documented and communicated to affected employees.
- **Process Review:** A thorough review of work processes and procedures will be conducted to identify potential sources of respiratory hazards. This review will:
 - Analyze each step of the process to identify where airborne contaminants may be generated.
 - Evaluate the effectiveness of existing engineering controls (e.g., ventilation, local exhaust systems).

- Consider the duration and frequency of employee exposure.
- Involve employees who perform the tasks to gather valuable input on potential hazards.
- **Employee Input:** Employees are a valuable source of information about potential respiratory hazards. They are encouraged to:
 - Report any unusual odors, dusts, fumes, or other airborne contaminants they observe in the workplace.
 - Report any symptoms they experience that may be related to respiratory exposure (e.g., coughing, shortness of breath, eye irritation).
 - Participate in hazard assessments and provide feedback on potential hazards and control measures.
 - A system for anonymous reporting should be available to encourage open communication.
- **Review of Incident History:** Reviewing past incident reports, near misses, and workers' compensation claims related to respiratory exposures. This review can help identify trends, recurring problems, and areas where additional controls or training may be needed.

APPROVAL PROCESS AND PROGRAM ENROLLMENT

To ensure compliance with all applicable safety regulations and medical clearances, all respirator use on campus, whether required by a specific task or chosen voluntarily by an employee where a respiratory hazard exists, must be approved by OEHS before any respirator is used. This structured process is designed to protect employee health and ensure the proper selection, fit, and use of respiratory protection equipment.

The following steps outline the respirator approval and program enrollment process:

- 1. Respirator Use Request:** To initiate the approval process, the requesting department or individual must complete the designated Respirator Use Request Form ([Respirator Request Form](#)). This form will collect necessary information, including:
 - The specific task or operation requiring respirator use.
 - The identified respiratory hazard(s).
 - The proposed type of respirator (if known).
 - The number of employees who will require respirators.
 - Departmental contact information and budget information (for cost allocation).
- 2. OEHS Review and Evaluation:** OEHS will review the completed Respirator Use Request Form and identify the appropriate respirator for use based on the identified hazards, available exposure data (if any), and relevant regulations.
- 3. Hazard Assessment (if necessary):** If a thorough hazard assessment has not already been conducted, OEHS will conduct or require a hazard assessment to determine the nature and extent of the respiratory hazard(s). This may involve air monitoring, process review, and other relevant evaluations.
- 4. Medical Evaluation Coordination:** If the respirator use is approved, OEHS will coordinate any necessary medical evaluations with Occupational Health Services. All employees required to use respirators must receive medical clearance to ensure they are physically capable of wearing a respirator. This evaluation may include a medical questionnaire, physical examination, and/or pulmonary function testing, as determined by the medical professional.
- 5. Supervisor Notification:** OEHS will notify the relevant department manager or supervisor of the approval and the need for employee participation in the Respiratory Protection Program. The supervisor is responsible for ensuring that their employees comply with all program requirements.
- 6. Equipment Recommendation and Procurement:** OEHS will provide recommendations on appropriate respirators, including specific models and sizes, based on the hazard assessment and medical evaluations. The requesting department is responsible for procuring the approved respirators. OEHS can assist with vendor selection and purchasing if requested.
- 7. Fit Testing:** Once respirators have been procured, OEHS will schedule and conduct fit testing for each employee who will be using a respirator. Fit testing will be performed using appropriate methods (qualitative or quantitative) and will be conducted by trained personnel.
- 8. Training:** All employees who use respirators will require some level of training from OEHS. This training will focus on topics such as the proper use, care, maintenance, limitations, and storage of respirators.
- 9. Cost Allocation:** The payment of any associated costs related to medical evaluations, fit testing, training, and respirator purchase will be the responsibility of the requesting WSU department associated with the request, if applicable. OEHS will provide cost estimates as needed.
- 10. Additional Evaluation Requirements:** It is important to note that additional evaluation requirements may be necessary based on the recommendations of the medical consultant or OEHS based on specific hazards.
- 11. Alternative Solutions (Medical Disqualification):** Should an individual not receive the appropriate medical clearance to wear a respirator, OEHS will work with the employee and their supervisor to identify alternative solutions, such as engineering controls, administrative controls, or reassignment to other tasks.

VOLUNTARY RESPIRATOR USE

Some employees may desire to wear respirators during certain operations that do not require the use of respiratory protection. Any Employee who voluntarily uses a respirator must first complete the designated Respirator Use Request Form ([Respirator Request Form](#)) to begin the approval process. OEHS will review each request on a case-by-case basis. If the use of respiratory protection in a specific case will not jeopardize the health or safety of the employee, OEHS will recommend respirators for voluntary use and provide proper training.

Voluntary respirator use is subject to certain requirements of this program.

RESPIRATOR SELECTION

This selection process will be based on a thorough hazard assessment and will take into account the following aspects:

- **Hazard Identification and Evaluation:** The types and severity of respiratory hazards present in the workplace will be carefully identified and evaluated; this includes:
 - The physical state of the contaminant (e.g., gas, vapor, particulate).
 - The concentration of the contaminant in the air.
 - The presence of oxygen deficiency (atmospheres containing less than 19.5% oxygen).
 - Any immediately dangerous to life or health (IDLH) conditions.
- **Objective Industrial Hygiene Data:** Objective industrial hygiene data, such as air monitoring results, will be used whenever available to determine the level of employee exposure and inform respirator selection. This data will be collected and analyzed by qualified personnel using appropriate sampling methods and equipment.
- **Initial Hazard Assessment (Prior to Data Collection):** Before objective industrial hygiene data can be obtained, OEHS will use knowledge of the hazard, work methods, and available information (e.g., SDS, similar operations) to determine the highest potential exposure. This initial assessment will be used to select interim respiratory protection until objective data is available. This interim protection will err on the side of caution, providing a higher level of protection than potentially necessary, until actual exposure levels are determined.
- **Respirator Type and Assigned Protection Factor (APF):** Based on the hazard assessment and exposure data, the appropriate type of respirator will be selected. This includes considering:
 - Air-Purifying Respirators (APRs): For atmospheres with sufficient oxygen and known contaminants. This includes particulate respirators (N, R, P series), gas/vapor respirators, and combination respirators.
 - The Assigned Protection Factor (APF) of the selected respirator will be considered to ensure it provides adequate protection against the identified hazard and exposure level. The APF is the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees.
- **User Considerations:** Factors related to the respirator user will be considered, including:
 - Facial irregularities such as scars, beards, or dentures that could interfere with the respirator seal will be taken into account. Special respirators, such as loose-fitting hoods or helmets, may be necessary.
 - Compatibility with eyeglasses or other corrective lenses will be considered.
 - Respirators will be selected for comfort and proper fit to encourage consistent use.
 - The workload of the employees and the level of physical stress placed upon the employee's respiratory system by the protective device will be assessed. Lighter-weight respirators or powered air-purifying respirators (PAPRs) may be considered for strenuous tasks.
- **NIOSH Certification:** All respirators must be certified by the National Institute for Occupational Safety and Health (NIOSH) and shall be used in accordance with the terms of that certification. Only NIOSH-approved respirators will be purchased and used.
- **Filter, Cartridge, and Canister Labeling:** All filters, cartridges, and canisters must be labeled and color-coded with the appropriate NIOSH approval label. The label must remain legible and not be removed or defaced while it is in use. The appropriate filter, cartridge, or canister will be selected based on the specific contaminant(s) present.

ASSIGNED PROTECTION FACTORS

The assigned protection factors listed below must be used to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), it must be ensured that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Assigned Protection Factors⁵					
Type of Respirator^{1,2}	Quarter Mask	Half Mask	Full Facepiece	Helmet/Hood	Loose-Fitting Facepiece
1. Air-Purifying Respirator	5	³ 10	50	-	-
2. Powered Air-Purifying Respirator (PAPR)	-	50	1,000	⁴ 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator <ul style="list-style-type: none"> • Demand mode • Continuous flow mode • Pressure-demand or other positive-pressure mode 	-	10 50 50	50 1,000 1,000	- ⁴ 25/1,000 -	- 25 -
4. Self-Contained Breathing Apparatus (SCBA) <ul style="list-style-type: none"> • Demand mode • Pressure-demand or other positive-pressure mode (e.g., open/closed circuit) 	- -	10 -	50 10,000	50 10,000	- -
Notes: <ol style="list-style-type: none"> 1. Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration. 2. The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements. 3. This APF category includes filtering facepieces, and half masks with elastomeric facepieces. 4. The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25. 5. These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii). 					

MAXIMUM USE CONCENTRATION (MUC)

- When measuring contaminant concentration outside of the respirator, the selected respirator must maintain the employee's exposure to the hazardous substance at or below the determined MUC.
- MUCs must not be applied to conditions that are immediately dangerous to life or health (IDLH).
- When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, the maximum MUC will be set at that lower limit.

APPROVED RESPIRATORS

The following types of respirators are **APPROVED** for use at WSU, depending on the specific hazard, application, OEHS approval:

- **Filtering Facepiece Respirators (Dust Masks)**
 - Various – Reach out to OEHS for Assistance
- **Elastomeric Half-Facepiece and Full-Facepiece Respirators**
 - Honeywell North 7000 Series
- **Powered Air-Purifying Respirators (PAPRs)**
 - Various - Reach out to OEHS for Assistance

PROHIBITED RESPIRATORS

The use of non-NIOSH-approved respirators is strictly prohibited

The use of atmosphere-supplying respirators (e.g., Self-Contained Breathing Apparatus [SCBA], Supplied-Air Respirators [SAR]) is not approved for use by any WSU employee. Should the need for atmosphere-supplying respirators arise in the future, their use will require prior written approval from OEHS and adherence to all applicable requirements of this Respiratory Protection Program, including medical evaluation, fit testing (quantitative), and specialized training.

The following types of respirators are **NOT APPROVED** for use by any WSU employee.

- Self-Contained Breathing Apparatus (SCBA)
- Supplied-Air Respirators (SARs) or Airline Respirators

MEDICAL EVALUATION

Medical evaluations to determine whether an employee is able to use a given respirator is an important element of an effective program and is necessary to prevent injuries, illnesses, and even in rare cases, death from the physiological burden imposed by respirator use.

All employees who are required to use respirators, or who voluntarily choose to use respirators where workplace hazards exist, must undergo a medical evaluation to determine their ability to use a respirator safely. This evaluation is essential to ensure that the physical demands of respirator use do not pose a health risk to the employee. Employees who voluntarily wear filtering face pieces (i.e. dust masks) are exempt.

All medical questionnaires and examinations are confidential and handled during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire is administered so that the employee understands its content. All employees are provided an opportunity to discuss the questionnaire and examination results with their physician or other licensed health care professional (PLHCP).

Before any initial examination or questionnaire is given, we supply the PLHCP with the following information so that he/she can make the best recommendation concerning an employee's ability to use a respirator:

- Type and weight of the respirator to be used by the employee.
- Duration and frequency of respirator use (including use for rescue and escape).
- Expected physical work effort.
- Additional protective clothing and equipment to be worn.
- Temperature and humidity extremes that may be encountered.

MEDICAL EVALUATION PROCESS:

WSU has contracted with both a clinic based (Henry Ford Health System) and remote based (Resp Assessor) provider to administer the medical evaluation portion of this program. Medical evaluations and any necessary physical examinations must be completed by a WSU approved medical provider.

WSU employees will not be assigned to tasks requiring use of respirators nor fit tested unless it has been determined that they are physically able to perform the work and use the respirator. Medical evaluations shall be conducted on employees to assure the capability of individuals wearing respirators and typically follow the process below:

- **Medical Questionnaire:** Each employee will be provided with a confidential medical questionnaire (OSHA 1910.134 Appendix C) designed to identify any pre-existing medical conditions that could be aggravated by respirator use. This questionnaire will address:
 - Respiratory conditions (e.g., asthma, emphysema).
 - Cardiovascular conditions (e.g., heart disease, high blood pressure).
 - Other relevant medical conditions (e.g., claustrophobia, seizures).
- **Physician or Licensed Healthcare Professional (PLHCP) Review:** The completed medical questionnaire will be reviewed by a Physician or Licensed Healthcare Professional (PLHCP). The PLHCP will determine if a physical examination or further testing is necessary.
- **Physical Examination (if necessary):** If the PLHCP determines that a physical examination is necessary, the employee will be scheduled for an examination. This examination may include:
 - Pulmonary function tests (e.g., spirometry).
 - Cardiovascular assessment.
 - Other relevant tests as determined by the PLHCP.
- **Medical Clearance:** The PLHCP will provide a written medical clearance or denial to OEHS and the employee. This clearance will indicate whether the employee is medically able to use a respirator and any

limitations or restrictions on respirator use (e.g., type of respirator, duration of use). In addition, the clearance will also identify the need for follow-up medical evaluations, if needed.

REEVALUATION

A follow-up medical examination will be provided if a positive response is given to any question 1 through 8 in Section 2, Part A of Appendix C of 29 CFR, 1910.134 or if an employee's initial medical examination demonstrates the need for a follow-up examination. A follow-up medical examination may include tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

If a respirator to be used is a negative pressure unit and the PLHCP finds a medical condition that may place the employee at an increased health risk, WSU will provide a powered air-purifying respirator (PAPR), should it be determined that the employee is capable of using a respirator. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the use of the PAPR will no longer be required.

All employees deemed to be capable of wearing respiratory protection as part of their job description will be re-examined under the following circumstances:

- Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains or wheezing.
- The PLCHP or supervisor informs OEHS that the employee needs to be reevaluated.
- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.
- A change occurs in the workplace conditions that may result in an increased physiological burden on the employee.

Additional medical evaluations will be provided whenever an employee reports or is observed to have a change in health status that could affect their ability to use a respirator safely (e.g., new diagnosis of a respiratory or cardiovascular condition, significant weight change, etc.).

FIT TESTING

It is important that respirators fit properly to provide efficient protection. If a tight seal is not maintained between the face piece and employee, contaminated air will be drawn into the facepiece and inhaled by the employee. Fit testing seeks to protect individuals from breathing contaminated ambient air and is one of the core provisions of the RPP.

Before any employee is required to use a respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that they will be using. Employees will be fit tested with the make, model and size of respirator that they will actually wear. Employees will also be provided with several models and sizes of respirators so that they may find an optimal fit.

All respirator-approved employees will be fit-tested at the following times:

- Prior to being allowed to wear any respirator with a tight fitting facepiece.
- Annually.
- If they receive any facial injuries, scarring, or loss of teeth,
- When they gain or lose 30 or more pounds,
- If they become fitted with dentures, or
- They are required to wear a different type of respirator for which they have not been fit tested.
- When an employee, subsequently after passing a qualitative fit testing (QLFT) or quantitative fit testing (QNFT), notifies OEHS that the fit of the respirator is unacceptable. The employee shall be retested with a different respirator face piece.

TESTING PROCEDURES

In general, fit testing may be either qualitative or quantitative.

- **Qualitative fit testing (QLFT):** this method involves the introduction of a gas, vapor, or aerosol test agent into an area around the head of the respirator user. Should one detect the presence of the test agent through subjective means, such as odor, taste, or irritation, the respirator fit is inadequate.
 - A qualitative fit test (QLFT) may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- **Quantitative Respirator Fit Test (QNFT):** the adequacy of the respirator fit is assessed by measuring the amount of leakage into the respirator, either by generating a test aerosol as a test atmosphere, using ambient aerosol as a test agent, or by using controlled negative pressure to measure the volumetric leak rate. Appropriate instrumentation is required to quantify respirator fit in QNFT.
 - If the fit factor, as determined through an OSHA-accepted quantitative fit test (QNFT) protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

Fit testing of tight-fitting powered air-purifying respirators shall be accomplished by performing the fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

- Qualitative fit testing (QLFT) of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
- Quantitative fit testing (QNFT) of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

- Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.
- A negative and positive pressure fit check must be conducted prior to qualitative fit testing.

WSU fit testing procedures include the following:

TSI PORTACOUNT quantitative fit testing procedures

TRAINING

Comprehensive training is essential to ensure that employees understand the importance of respiratory protection and are able to use respirators correctly and effectively. All employees required to use respirators will receive training before being required to use a respirator in the workplace, annually thereafter, and whenever there are changes in the workplace, respirator type, or program procedures.

OEHS will provide training (Online and/or In-person) to all respirator users and their supervisors on 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.
- Explanation of the WSU Respiratory Protection Program.
- The OSHA Respiratory Protection standard (29 CFR 1910.134) and MIOSHA Respiratory Protection Standard (Part 451).
- Respiratory hazards that may be encountered at WSU and their health effects.
- Proper selection and use of respirators.
- Respirator donning and user seal (fit) checks.
- Fit testing.
- Medical signs and symptoms limiting the effective use of respirators.
- Employees must demonstrate their understanding of the topics covered in the training through hands-on exercises and a written test.

RETRAINING

This training shall be presented in a manner that is understandable to the employee and prior to being assigned to a workplace requiring respirator usage. Retraining shall be administered annually, and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete.
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill.
- Any other situation arises in which retraining appears necessary to ensure safe respirator use.

TRAINING CERTIFICATION

OEHS must certify that the required training has been accomplished. This certification shall contain the following:

- Employee's names
- Signatures or initials of the trainers
- The dates of training.
- Copies of the training materials used.

The certification shall be available for inspection by employees and their authorized representatives. Respirator training will be documented by OEHS and will include the type, model and size of respirator for which each employee has been trained and fit tested.

RESPIRATOR USE

Employees will use their respirators under the conditions specified by this program, and in accordance with the training they receive on the use of each particular respirator model. In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by its manufacturer.

- Employees are not permitted to wear tight-fitting respirators if they have any condition, such as the following:
 - Facial scars.
 - Facial hair.
 - Missing dentures that prevent them from achieving a good seal.
- Employees are not permitted to wear headphones, jewelry, or other articles that may interfere with the facepiece-to-face seal.
- Any required corrective glasses, goggles or other personal protective equipment must be worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
- For all tight-fitting respirators, a seal check must be performed each time the respirator is put on.
- The continued effectiveness of a respirator must be reevaluated when there is a change in work area conditions, degree of employee exposure, or stress that may affect respirator effectiveness.
- When leaving the respirator use area employees must wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use.
- Employees must leave the respirator use area if any of the following occur:
 - If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or
 - To replace the respirator or the filter, cartridge, or canister elements.
 - To wash their faces or respirators as necessary to prevent eye or skin irritation.
 - Conduct repairs or maintenance on a respirator where vapor or gas breakthrough was detected.
- The following precautions need to be taken to be sure that the respirator itself does not present a hazard.
 - Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning, and care, and warnings regarding the respirator's limitations.
 - Make sure that the respirator in use is adequately protecting against the contaminant of concern.
 - All respirators and cartridges/filters issued are certified by NIOSH and are designed to protect against specific contaminants.
 - 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 against gases, vapors, or very small solid particles of fumes or smoke.
 - Do not wear your APR respirator in an oxygen deficient atmosphere (containing less than 19.5% oxygen content).
 - Keep track of your respirator so that you do not mistakenly use someone else's respirator.

RESPIRATOR MALFUNCTION

For any malfunction (e.g., such as breakthrough, facepiece leakage, or improperly working valve), the respirator wearer should inform his or her supervisor that the respirator no longer functions as intended and go to a non-contaminant area for maintenance or to replace the respirator.

The supervisor must ensure that the employee receives the needed parts to repair the respirator or is provided with a new respirator prior to continuing work.

IDLH ATMOSPHERES

WSU prohibits employees from entering a work environment where the atmosphere is classified immediately dangerous to life or health (IDLH). Procedures have not been established for employees who may be required to enter IDLH atmospheres.

In the event of an emergency, call WSU Police Department at 577-2222 from a safe location.

BREATHING AIR QUALITY AND USE

Atmosphere-supplying respirators (supplied-air and SCBA) must use breathing gases of high purity. Any compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration must meet the following specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen and/or the ANSI/Compressed Gas Association Commodity Specification for Air.
- Compressed breathing air shall meet at least the requirements for Grade D breathing air, which includes the following:
 - 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 must not be used in atmosphere-supplying respirators that have previously used compressed air.
- Oxygen concentrations that are greater than 23.5% must only be used in equipment designed for oxygen service or distribution.

CYLINDER REQUIREMENTS

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

- Cylinders must be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation.
- Cylinders of purchased breathing air must have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air.
- The moisture content in the cylinder does not exceed a dew point of -50°F (-45.6°C) at 1 atmosphere pressure.
- Only the respirator manufacturer's NIOSH-approved breathing-gas containers may be used.
- Containers must be marked and maintained in accordance with the Quality Assurance provisions of the NIOSH approval for the SCBA as issued in accordance with the NIOSH respirator-certification standard.

COMPRESSOR REQUIREMENTS

Any compressor used to supply breathing air to respirators must be constructed and situated so as to accomplish the following:

- Prevent entry of contaminated air into the air-supply system.
- Minimize moisture content so that the dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature.
- Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality.
 - Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.
- Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change.
 - The tag shall be maintained at the compressor.

- For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.
- For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, 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.
- Breathing air couplings must be incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

BREATHING AIR COUPLINGS

Ensure that breathing air couplings are incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance must be introduced into breathing air lines.

MAINTENANCE AND CARE

To ensure continuing protection from respiratory protection devices, it is necessary to establish and implement proper maintenance and care procedures and schedules. Improper maintenance and care will negate successful selection and fit because the devices will not deliver the assumed protection unless properly maintained.

CLEANING AND DISINFECTING

All respirators will be cleaned and disinfected in accordance with the manufacturer's requirements. Respirators shall be cleaned and disinfected at the following intervals:

- Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
- Respirators maintained for emergency use shall be cleaned and disinfected after each use.
- Respirators used in fit testing and training shall be cleaned and disinfected after each use.

CLEANING PROCEDURES

WSU provides each respirator user with a respirator that is clean, sanitary, and in good working order. To ensure that respirators are cleaned and disinfected, procedures of equivalent effectiveness as required in Appendix B-2 of 29 CFR, 1910.134 have been adopted. Respirators shall be cleaned and disinfected at the intervals outlined in the table below.

Cleaning and Disinfecting Intervals	
Respirator Type	Interval
Issued for the exclusive use of an employee	As often as necessary to be maintained in a sanitary condition
Issued for more than one employee.	Before being worn by different individuals, and after each use
Maintained for Emergency use.	After each use.
Used in fit testing and training.	After each use.

Follow all manufacturer recommendations for respirator specific cleaning instructions. In the absence of a specific cleaning procedure the following procedure may be used for cleaning and disinfecting respirators:

1. 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.
2. Wash components in warm (43°C [110°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.
3. Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably running water. Drain.
4. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
 - a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43°C(110°F); or,

- b. 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°C (110°F); or,
 - c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
5. Rinse components thoroughly in clean, warm (43°C [110°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.
 6. Components should be hand-dried with a clean lint-free cloth or air-dried.
 7. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
 8. Test the respirator to ensure that all components work properly.
 9. Place in a clean, dry plastic bag or other airtight container.

Note: Departmental Supervisors must ensure an adequate supply of appropriate cleaning and disinfecting supplies are available. If supplies are low, employees should contact their supervisor and request additional supplies.

STORAGE

Proper storage of respirators shall be conducted to ensure that the equipment is protected from environmental conditions that may cause deterioration. WSU requires respirators to be packed in plastic bags or containers for protection from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. Each employee must have their name on the bag and ensure that bag will only be used to store that employee's respirator.

INSPECTION

In order to assure the continued reliability of respirator equipment, inspections need to be conducted on a regular basis. The frequency of inspection is related to the frequency of use. The following details frequencies for inspections:

Inspection Frequencies	
Respirator Type	Frequency
All Types used in routine situations.	Before each use and during cleaning
Maintained for use in emergency situations.	Monthly and both before and after use.
Emergency and escape-only respirators.	Currently, not available at the facility.

All respirators shall be inspected during cleaning and prior to use by the assigned employee. The employee is responsible for inspection of the following parts of the respirator:

- A check of respirator function.
- Tightness of connections.
- The condition of the various parts including but not limited to the following:
 - Facepiece.
 - Head straps.

- Valves.
- Connecting tube.
- Cartridges, canisters or filters.
- Elastomeric parts for pliability and signs of deterioration such as:
 - Cracks, tears or holes.
 - Facemask distortion
 - Cracks or tears in valve material
 - Cracks or dents in housing
 - Breaks or tears
- Broken buckles
- Residue or dirt
- Approval designation
- Gaskets

For self-contained breathing apparatus, in addition to the above, air cylinders are to be maintained in a fully charged state and recharged should the pressure fall below 90% of the rated pressure level. The regulator and warning devices are to be inspected for proper working condition.

SCBA maintained for emergency use shall be certified by documenting the date the inspection was performed, the name (initials) of the person who made the inspection, the findings, hydrostatic testing due date, and cylinder serial number.

REPAIR

- Respirators that are found defective and are in need of repair, shall be taken out of service immediately. If, during an inspection, an employee discovers a defect in a respirator, they are required to bring the defect to the attention of their supervisor. Supervisors will give any defective respirators to the OEHS for evaluation.
- When a respirator is taken out of service for an extended period of time, the respirator will be tagged out of service, and the employee will be given a replacement of similar make, model, and size. All tagged out respirators will be kept in a designated storage space selected by OEHS.
- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator.
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.
- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

MAINTENANCE

- Respirators are to be properly maintained at all times in order to ensure that they function properly and adequately protect the employee.
- Maintenance involves a thorough visual inspection for cleanliness and defects. Work or deteriorated parts will be replaced prior to use.
- No components will be replaced or repairs made beyond those recommended by the manufacturer.

CHANGE SCHEDULES

- WSU will use manufacturer recommended change-out based on the operations or the objective industrial hygiene data or data from similar operations for determining when respirators and respirator cartridges should be replaced. In general, the following guidelines apply:
 - Employees wearing APR or PAPR with P100 filters for protection against particulates should change the cartridges on respirators when one first begins to experience difficulty breathing (i.e., resistance) while wearing a mask or at end of workday.
 - APR equipped with organic vapor or acid gas cartridges require cartridge replacement on a monthly basis or if wearer experiences a foul smell or taste while wearing to ensure the continued effectiveness of the respirator.

DISCARDING OF RESPIRATORS

- Respirators that fail an inspection or are not fit for use and are unserviceable must be discarded.

PROGRAM EVALUATION AND RECORDKEEPING

WSU recognizes that problems with protection, irritation, breathing resistance, comfort, and other respirator-related factors occasionally arise with respiratory protection programs. Although it is not possible to eliminate all problems associated with respirator use, WSU strives to eliminate as many problems as possible to maximize the effectiveness of the respiratory protection program. At least annually, a program evaluation shall be performed consisting of:

- OEHS will conduct periodic evaluations of the workplace to ensure that the provisions of this program are being implemented and effective.
- The evaluations will include regular consultations with employees who use respirators and their supervisors, site inspections, air monitoring, and a review of records.
- Problems identified will be noted in an inspection log and addressed by OEHS. Areas of evaluation should include, but are not limited to, the following:
 - Respirator fit (including the ability to use the respirator without interfering with effective workplace performance).
 - Appropriate respirator selection for the hazards to which the employees are exposed.
 - Proper respirator use under the workplace conditions the employee encounters.
 - Proper respirator maintenance.

These findings will be documented to include a list of plans to correct deficiencies in the respirator program and target dates for the implementation of those corrections.

DOCUMENTATION AND RECORDKEEPING

- A written copy of this program is kept in the OEHS office and is available to all employees who wish to review it. In addition, a copy of the program is also available on the OEHS website (<https://research.wayne.edu/oehs/health-safety/respirators>)
- Records of training and fit test records are maintained in the OEHS office. These records will be updated as new employees are trained, as existing employees receive refresher training, and as new fit tests are conducted.
- OEHS will maintain copies of the medical records for all employees covered under the respirator program. Only the physician's written recommendation regarding each employee's approval and/or ability to wear a respirator will be retained. Medical questionnaire and physician's documented findings are confidential and will be on file with the occupational health provider.

VERSION CONTROL

Version	Date	Notes
1.0	Various	Uncontrolled Versions
2.0	January 2025	Full update and revision. Implement document control process.