



**TEXAS WOMAN'S**  
**UNIVERSITY™**

# Respiratory Protection Program

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Office of Environmental Health & Safety

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<https://twu.edu/health-safety>



## Table of Contents

<b>I. PURPOSE.....</b>	<b>1</b>
<b>II. DEFINITIONS .....</b>	<b>2</b>
<b>III. APPLICABILITY .....</b>	<b>5</b>
<b>IV. MEDICAL EVALUATION.....</b>	<b>5</b>
<b>V. RESPIRATOR SELECTION .....</b>	<b>7</b>
<b>VI. FIT TESTING .....</b>	<b>7</b>
<b>VII. USE OF RESPIRATORS .....</b>	<b>8</b>
A. <i>Facepiece Seal Protection .....</i>	<i>9</i>
B. <i>Maintenance and Care of Respirators .....</i>	<i>9</i>
1. Cleaning and Disinfecting .....	9
2. Storage .....	10
3. Inspection .....	10
4. Repair .....	11
5. Cartridge & Filtering Facepiece Change Schedules.....	11
C. <i>Breathing Air .....</i>	<i>12</i>
<b>VIII. RESPIRATORY HAZARD: CRYSTALLINE SILICA.....</b>	<b>12</b>
A. <i>Protecting Employees from Occupational Exposures .....</i>	<i>12</i>
1. Engineering controls .....	12
2. Administrative controls .....	13
3. Personal Protective Equipment .....	13
B. <i>Exceptions .....</i>	<i>13</i>
<i>Exposure Monitoring.....</i>	<i>13</i>
1. Initial Exposure Monitoring: .....	13
2. Periodic Exposure Monitoring: .....	14
3. Termination of Exposure Monitoring: .....	14
C. <i>Sampling Records .....</i>	<i>14</i>
D. <i>Reporting of exposure monitoring results.....</i>	<i>15</i>
E. <i>Housekeeping .....</i>	<i>15</i>
1. Prohibited: Dry Sweeping .....	15
2. Prohibited: Compressed Air .....	15
F. <i>Signage .....</i>	<i>15</i>
<b>IX. RECORD KEEPING .....</b>	<b>16</b>

<b>X. TRAINING .....</b>	<b>17</b>
<b>XI. PROGRAM EVALUATION .....</b>	<b>18</b>
<b>ATTACHMENT A .....</b>	<b>19</b>
<b>ATTACHMENT B .....</b>	<b>23</b>
<b>ATTACHMENT C .....</b>	<b>28</b>
<b>ATTACHMENT D .....</b>	<b>38</b>

## **I. PURPOSE**

This respiratory protection program has been developed by Texas Woman's University (TWU) in compliance with the Occupational Safety and Health Administration's (OSHA) respiratory protection requirements. More specifically, the University must "develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use" (29 CFR 1910.134). This program also meets the requirements of TWU's University Regulations and Procedures [Policy 04.430: Environmental Health and Safety](#).

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below published exposure limits, to provide an additional level of protection for employees and students. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker.

There is the potential for TWU employees and students to be exposed to harmful airborne contaminants during activities such as:

- Welding, burning, or plasma cutting of metal
- Cutting, jackhammering, drilling, etc. of concrete & brick
- Art studio, Fine Arts outdoor spray booth, or facility maintenance painting
- Sandblasting
- Sand casting
- Ceramics activities, including mixing of dry clay or glazes
- Various other dust-producing activities throughout campus
- Cleaning/maintenance in the Cooling Towers
- Resin/plastics work
- Laboratory work
- TWU PD (tactical team only) \*tactical team discontinued since 2023

This respiratory protection program includes the following required elements:

- Respirator selection
- Medical evaluation requirements for employees and students who will use respirators
- Fit testing procedures
- Procedure for proper use of respirators in routine and emergency situations
- Procedure for cleaning, disinfecting, storing, inspecting, repairing, discarding, and maintaining respirators
- Required training of employees and students as to the respiratory hazards associated with their jobs or education, and in the proper use of the respirator and any limitations on use and maintenance
- Procedure for regularly evaluating the effectiveness of the program
- Determining the service life of filtering facepieces and respirator cartridges

## **II. DEFINITIONS**

The following regulatory definitions are related to this Respiratory Protection Program:

**Action Level** - The eight-hour time-weighted average (TWA) concentration of an airborne contaminant, which is below the Permissible Exposure Limit, but above which additional regulatory requirements apply.

**American Conference of Governmental Industrial Hygienists (ACGIH)** - An independent organization that establishes occupational health guidelines for chemical hazards.

**Air-Purifying Respirator** - A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

**Atmosphere-Supplying Respirator** - 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** - A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

**Crystalline Silica** - Naturally occurring component in earth soils, sand, granite, and many other minerals resulting in many building materials containing silica.

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

**Dust Mask** - See “Filtering Facepiece”

**Emergency Situation** - 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 or Student Exposure** - Exposure to a concentration of an airborne contaminant that would occur if the employee or student were not using respiratory protection.

**End-of-Service-Life Indicator (ESLI)** - 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** - A respirator intended to be used only for emergency exit.

**Filter or Air Purifying Element** - Component used in respirators to remove solid or liquid aerosols from the breathing air.

**Filtering Facepiece** - 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** - A quantitative estimate of the fit of a particular respirator to a specific individual, which typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

**Fit Test** - The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

**High Efficiency Particulate Air (HEPA) Filter** - A filter that is at least 99.97% efficient in removing airborne particles of 0.3 micrometers and greater in diameter.

**Immediately Dangerous to Life or Health (IDLH)** - 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. ***No TWU employees or students shall be permitted to enter IDLH atmospheres.***

**Lab Animal Allergies** - Immune response resulting in an allergic reaction caused by proteins found in the dander, hair/fur, scales, saliva, urine and other body wastes of lab animals.

**Legionella** - The bacterium *Legionella pneumophila* that causes Legionnaires' disease, which can flourish in poorly maintained air conditioning and central heating systems.

**Legionnaires' Disease** - caused by the *Legionella pneumophila* bacterium, characterized initially by symptoms resembling influenza followed by high fever, cough, diarrhea, severe pneumonia and mental confusion; may be fatal, especially in elderly and immunocompromised individuals.

**National Institute for Occupational Safety and Health (NIOSH)** - An independent organization that establishes occupational health guidelines for chemical hazards. NIOSH also performs testing and certification for respirators and associated products for OSHA.

**Negative Pressure Respirator (Tight Fitting)** - A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

**Permissible Exposure Limit (PEL)** - The maximum permitted eight-hour time-weighted average (TWA) concentration of an airborne contaminant, established by OSHA, to which employees may be exposed. PEL tables are found in [29 CFR Part 1910, Subpart Z](#).

**Positive Pressure Respirator** - A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

**Qualitative Fit Test (QLFT)** - 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)** - An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

**Recommended Exposure Limit (REL)** - Acting under the authority of the Occupational Safety and Health Act of 1970 (29 USC Chapter 15) and the Federal Mine Safety and Health Act of 1977 (30 USC Chapter 22), the National Institute for Occupational Safety and Health (NIOSH) develops and periodically revises recommended exposure limits (RELs) for hazardous substances or conditions in the workplace. Unlike the PELs, RELs are not regulatory standards; however, it is TWU's policy to limit employee and student exposure to the lowest exposure limit of published PEL, TLV, or REL for each substance.

**Silica-Containing Material** - Any material which has the potential to contain silica at levels which may pose a hazard to employees when the material is manipulated to create airborne particles.

**Silicosis** - A lung disease caused by inhalation of silica dust. Silica dust can cause fluid buildup and scar tissue in the lungs that cuts down the ability for the lungs to fully function. The disease is not curable but can be prevented through the use of protective systems.

**Threshold Limit Values (TLV)** - Eight-hour time-weighted average (TWA) concentrations of substances that employees may be repeatedly exposed to without suffering adverse effects. TLVs are developed by the American Conference of Industrial Hygienists (ACGIH). Unlike the PELs, TLVs are not regulatory standards; however, it is TWU's policy to limit employee and student exposure to the lowest exposure limit of published PEL, TLV, or REL for each substance.

### **III. APPLICABILITY**

The Director of Environmental Health & Safety (EH&S) is designated as the respiratory protection program administrator and will be responsible for implementation of this program. TWU employee supervisors and faculty or staff overseeing students covered under this program are responsible for ensuring that hazard assessments have been conducted in order to determine personal protective equipment (PPE) requirements, including respiratory protection equipment. Areas, equipment, or work activities that are identified as having potential respiratory hazards may then be further evaluated through personal or area monitoring in order to determine the level of employee or student exposure. Assessments should be conducted whenever changes in university facilities or operations may affect the industrial hygiene of a given laboratory or workspace.

Engineering controls, such as ventilation systems and laboratory hoods, shall be implemented **prior to requiring the use of respiratory protection equipment**. Selection of appropriate respiratory protection equipment shall then be determined based on the remaining respiratory hazards not controlled by engineering controls. The selected respiratory protection equipment will be recorded in the Required Respiratory Protection Equipment Form ([Attachment A](#)). Area hazard assessments and monitoring data shall be maintained on site. Areas/tasks that are reasonably expected to have significant respiratory hazards, but for which an assessment or testing has not been conducted, **shall be considered to be IDLH**.

**It is TWU's policy to limit employee and student exposure to the lowest exposure limit of published PEL, TLV, or REL for each substance.** TWU will also minimize employee and student exposure to respiratory hazards as much as is feasible.

OSHA has promulgated substance-specific standards for a number of respiratory hazards, which can be found in [29 CFR 1910 Subpart Z - Toxic and Hazardous Substances](#). If a substance covered by these standards is identified through future hazard assessment or exposure monitoring, the applicable regulations must be adhered to and will supersede any conflicting information in this plan.

### **IV. MEDICAL EVALUATION**



Using a respirator may place a physiological burden on employees and students that varies with the type of respirator worn, the task being performed, conditions in which the respirator is used, and the medical status of the individual. No TWU employees or students shall be permitted to wear a negative pressure respirator (tight-fitting full face or half mask) respirator until a medical evaluation has been conducted.

A medical evaluation is required to evaluate an employee or student's ability to use a respirator before the employee or student is fit tested or required to use a respirator. Medical evaluations are also required if an employee or student experiences breathing difficulty during a fit test or at any time when using a respirator. An occupational medical provider has been contracted to perform medical evaluations via an online medical questionnaire that obtains the same information as the OSHA medical questionnaire found in 29 CFR 1910.134 Sections 1 and 2 and Part A of Appendix C ([Attachment B](#)).

The following information will also be provided to the occupational medical provider through the online medical questionnaire. This information is required to determine the individual's ability to use a respirator:

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

Following completion of the online medical questionnaire, a follow-up medical examination may be determined to be necessary prior to use of a respirator. The follow-up medical examination may include medical tests, consultations, or diagnostic procedures that the examining physician deems necessary to make a final determination of the individual's fitness to wear a respirator. The medical questionnaire and examination will be administered confidentially during the employee's normal working hours, or at a time convenient to the employee or student. The medical questionnaire will be administered in a manner that ensures that the employee or student understands the content of the questions.

The examining health care professional must provide the employee or student, and their supervisor, with copies of information regarding any limitations on respirator use related to the medical condition of the employee or student, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee or student is medically able to use the respirator.

## **V. RESPIRATOR SELECTION**

TWU employees and students must use respirators and filter cartridges that are certified by NIOSH. The respirators and filters may only be used in atmospheric conditions for which they have been certified. TWU's Office of Environmental Health and Safety (EH&S) in the Department of Risk Management will assist departments to determine the appropriate respirator and filter cartridges for the atmospheric hazard in question. EH&S will review air sampling data and recommend respiratory protection equipment that is appropriate for the type and concentration of the air contaminant.

The types of respirators and cartridges selected by EH&S and required to be used for specific areas/tasks shall be designated in the Required Respiratory Protection Equipment table in [Attachment A](#). Employees and students shall be provided a sufficient number of model and size options so that the respirator fit is acceptable and correctly fits the user. Respirators listed as being optional in Attachment A may be used voluntarily ([see below](#)) but are not required.

**Voluntary use of respirators** by employees or students in areas where respirator use is not required by this plan must be approved by the employee's supervisor or the faculty or staff supervising students. If such use is permitted, the employee or student voluntarily using respirators will be subject to all of the provisions of [Section IV](#) (Medical Evaluation) and the parts of [Section VII](#) related to proper cleaning, storage, and maintenance of the respirator. In addition, employees or students using respirators voluntarily must be provided with a copy [Attachment D](#) of this plan. A signed copy of [Attachment D](#) must be maintained by the employee or student's department.

The exception to this rule is for filtering facepiece respirators (dust masks). Employees or students who are voluntarily using filtering facepiece respirators are only subject to the parts of [Section VII](#) related to proper cleaning, storage, and maintenance of the respirator, and must receive and sign [Attachment D](#) as per above.

Employees will be provided with required respirators free of cost by their respective department, while students may be required to purchase respirators required for a particular class or activity. TWU will generally not purchase respirators for voluntary use for either employees or students.

## **VI. FIT TESTING**

After an employee or student receives medical clearance from the occupational medical provider to wear a respirator, the employee or student must be fit tested. The employee must be fit tested with the **same make, model, style, and size of respirator that will be used.**

Employee supervisors and faculty or staff overseeing affected students are responsible for ensuring that an appropriate tight-fitting facepiece respirator has an appropriate QLFT or QNFT. It is also the responsibility of employee supervisors and faculty or staff overseeing affected students to ensure that employees and students using a tight-fitting facepiece respirator is fit tested at the following times:

- Prior to initial use of the respirator
- Whenever a different respirator facepiece (size, style, model or make) is used
- At least annually thereafter

TWU employees and students must have an additional fit test whenever the employee or student reports, or the examining physician, supervisor, or supervising faculty or staff makes visual observations of changes in the employee or student's physical condition that could affect respirator fit. Such conditions include, but are not limited to:

- Facial scarring
- Dental changes
- Cosmetic surgery
- Obvious change in body weight

If, after passing a Qualitative Fit Test (QLFT) or Quantitative Fit Test (QNFT), the employee or student notifies their supervisor that the fit of the respirator is unacceptable, the employee or student will be given a reasonable opportunity to select a different respirator facepiece and to be fit tested for it.

The fit test must be administered using an OSHA-accepted QLFT or QNFT protocol listed in [29 CFR 1910.134 Appendix A](#). The QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less (see [Assigned Protection Factors in 1910.134\(d\)\(2\)\(i\)](#)). If the fit factor, as determined through an OSHA-accepted 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.

Records of employee fit tests, including the make, model, style, and size of respirator tested, shall be maintained by EH&S.

## **VII. USE OF RESPIRATORS**

TWU employees and students are prohibited from entering known or suspected IDLH atmospheres for any reason.

#### **A. Facepiece Seal Protection**

Supervisors and faculty or staff overseeing students must not allow respirators with tight-fitting face pieces to be worn by employees or students who have the following:

- Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function
- Any condition that interferes with the face to facepiece seal or valve function
- The use of corrective glasses or goggles or other PPE such that they interfere with the face to facepiece seal

Note: If an employee or student wears corrective glasses or goggles or other PPE, such equipment must be worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

All employees and students must perform a user seal check each time they put on the respirator using the procedures in [29 CFR 1910.134 Appendix B-1](#) or procedures recommended by the specific respirator manufacturer. Manufacturer instructions must be followed for filtering facepiece respirators, as the procedure listed in 29 CFR 1910.134 Appendix B-1 are not applicable.

#### **B. Maintenance and Care of Respirators**

TWU employees and students are responsible for the maintenance and care of their assigned respirator. Respirator maintenance responsibilities include:

- Cleaning and disinfecting
- Storage
- Inspection
- Repair
- Cartridge & filtering facepiece changes

##### **1. Cleaning and Disinfecting**

TWU will provide each affected employee a respirator that is clean, sanitary, and in good working order. Students will either be provided a respirator in this condition or will be required to obtain one meeting these standards. Employees and students are responsible for proper cleaning and disinfection of their respirators. Routine cleaning and disinfection will be achieved through use of alcohol wipes/towelettes to clean the interior of respirators. If respirators are to be shared between employees/students, then the periodic cleaning specified below shall be used between users.

Periodic cleaning shall be accomplished by the following:

1. Disassembly of the respirator
2. Cleaning of parts in warm soapy water
3. Rinsing thoroughly with warm water
4. Hand or air drying of parts
5. Disinfection as necessary
6. Reassembly of respirator
7. Testing to ensure proper function

Respirators should be disinfected at the following intervals:

- As often as necessary when issued for exclusive use
- Before being worn by different individuals
- After each use of emergency respirators and those used in fit testing and training

Disinfect respirators by:

- Immersing for 2 minutes in a solution of one part bleach to 9 parts water, or
- Wipe with alcohol wipes/towelettes

Additional cleaning procedures are described in [Appendix B-2 of 29 CFR 1910.134](#) (attached). Cleaning instructions provided by the respirator manufacturer that differ from the above may be followed, provided that such procedures are of equivalent effectiveness.

## 2. Storage

Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and to prevent deformation of the facepiece and exhalation valve. This is generally accomplished by placing the respirator in a plastic zippered bag and storing it in a location meeting the above requirements. If the equipment manufacturer specifies storage procedures, they will be followed in lieu of the general requirements above.

## 3. Inspection

TWU employees and students are required to inspect respirators (including filtering facepieces, sandblasting hoods/helmets, etc.) before each use and during the cleaning process.

Respirators that are only used in emergencies must be inspected at least monthly.

The inspection process shall include the following:

- Check of respirator function,
- Tightness of connections,
- Condition of the various parts including, but not limited to:
  - Facepiece
  - Head straps
  - Valves
  - Connecting tube (if so equipped)
  - Hood/helmet (if so equipped)
  - Cartridges, canisters, or filters
  - A check of elastomeric parts for pliability and signs of deterioration

#### 4. Repair

Respirators that fail an inspection or are otherwise found to be defective must not be used. Employees and students must report defective or damaged respirators to their supervisor. The respirator shall be destroyed and disposed, returned to the manufacturer for repair, or repaired with manufacturer approved user-replaceable parts. If an employee or student's respirator is disposed, employees will be supplied with the same make, model, and size replacement and students will be required to obtain a replacement respirator of the same make, model, and size. If a different make, model, style or size of respirator is provided, a new fit test will be required prior to use of the respirator.

#### 5. Cartridge & Filtering Facepiece Change Schedules

Filtering facepieces and filter cartridges for air purifying respirators must be changed regularly to ensure that they are properly protecting TWU employees and students. Supervisors are responsible for establishing change schedules with the assistance of EH&S based on sampling data and respirator manufacturer information. Change schedules for each task/area requiring respirator use are listed in the [Required Respiratory Protection Equipment table \(Attachment A\)](#). The minimum change schedules for respirator cartridges and filtering facepieces are listed below.

Respirator cartridges must be replaced:

- Immediately whenever the employee or student detects vapor or dust breakthrough
- Immediately whenever breathing becomes more difficult
- For organic vapor cartridges or other chemical cartridges (versus dust/particulate cartridges), **8 hours or one workday (whichever is**

less) of use; chemical cartridges must **not be reused for more than one day no matter what**

- If particulate filters are used to protect against radioactive materials or microorganisms, they also **must not be used for more than one day**

Filtering facepieces (dust masks) must be replaced:

- Immediately whenever the employee detects fume or dust breakthrough
- Immediately whenever breathing becomes more difficult
- Whenever the facepiece becomes soiled/dirty or damaged
- If filtering facepieces are used to protect against radioactive materials or microorganisms, they **must not be used for more than one day**

### C. Breathing Air

Breathing supplied to TWU employees and/or students via air compressors bottled/containerized air must meet the purity requirements of [29 CFR 1910.134\(i\)](#) (Grade D Air).

## VIII. RESPIRATORY HAZARD: CRYSTALLINE SILICA

In 2016, OSHA published a final rule regulating occupational exposure to respirable crystalline silica in General Industry and Construction to ensure that no employee is exposed to airborne concentration of respirable crystalline silica in excess of the PEL **50 micrograms** per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ), **averaged over an 8-hour day**. At TWU, the only documented exposures to levels of crystalline silica above the PEL occur while mixing ceramic dusts. However, actions which disturb concrete, masonry, tile, and rock, through cutting, drilling, etc. could potentially expose workers to high airborne concentrations of silica. Please consult EH&S prior to undertaking these activities to ensure the correct engineering controls and PPE are available, and/or to sample for silica as necessary.

### A. Protecting Employees from Occupational Exposures

Recommendations for employee occupational exposures will follow the protection hierarchy. The established hierarchy order is Engineering Controls, Administrative Controls, and Personal Protective Equipment (PPE).

#### 1. Engineering controls

Engineering controls for mitigation of silica dust include the use of water or a vacuum system to limit dust exposure.

## 2. Administrative controls

Administrative controls include the use of task rotations or task time limits to reduce the employee's time working with or around silica dust. Additional training given to the employees about the hazard and control methods is also considered an administrative control.

## 3. Personal Protective Equipment

PPE is used when engineering and administrative controls are not feasible or do not lower the exposure to an acceptable level. PPE includes wearing an appropriate respirator and following the requirements of this Respiratory Protection Program.

### B. Exceptions

If the time-weighted average for all of the tasks to be completed in the 8 hour shift remain below the OSHA Action Level of  $25 \mu\text{g}/\text{m}^3$ , without the implementation of engineering controls, then one is exempt from the requirements of the standard. Some examples of tasks that, according to OSHA, can be reasonably expected to have exposures below this threshold include: mixing concrete for post holes, pouring concrete footers, slab foundation, and foundation walls, and removing concrete formwork.

If the task involves only occasional, brief exposures to silica that last 15 minutes or less, and occur no more than once per shift, it can be reasonably anticipated per OSHA that the 8-hour time weighted average (TWA) will remain under the  $25 \mu\text{g}/\text{m}^3$  threshold and, therefore, the standard would not apply. Examples of where this often applies is carpenters, electricians, and plumbers performing tasks (e.g., drilling with a handheld drill) involving occasional, brief exposures to silica that are incidental to their primary work. However, always check with EH&S to ensure you are adequately protected and always follow this procedure if you will be doing these activities more than once per shift, or longer than 15 minutes. An exception to conducting exposure assessments is allowed if the employer "fully and properly implemented the engineering controls, work practices, and respiratory protection" listed in Table 1 of 29 CFR 1926.1153 (c) (1), *Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica* (Attachment C).

### Exposure Monitoring

#### 1. Initial Exposure Monitoring:

Any work with silica containing materials where there is a risk of exposure through inhalation of dust will undergo exposure monitoring, except for work done in accordance with acceptable engineering controls, work practices and respiratory protection in accordance with Table 1 of 29 CFR 1926.1153



Initial exposure monitoring should be conducted by EH&S to quantitatively evaluate the exposure to airborne silica.

Exposure monitoring should be conducted on any employee exposed to airborne silica dust as levels may vary based on job duty within a project. For example, the employee performing concrete cutting versus an employee providing supervision during the work.

If initial monitoring indicates employee exposures are below the action level (I), the monitoring may be discontinued.

Where monitoring indicates any level of silica exposure above the Action Level, periodic exposure monitoring will be conducted.

## 2. Periodic Exposure Monitoring:

Whenever silica exposure levels are greater than the action level ( $25\mu\text{g}/\text{m}^3$ ), periodic exposure monitoring is required. It is the responsibility of the affected department to work with EH&S and develop a periodic exposure-monitoring schedule.

Action level means a concentration of airborne respirable crystalline silica of  $25\mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.

The frequency of exposure monitoring should be as follows:

<u>Measured Concentration</u>	<u>Monitoring Frequency</u>
> Action Level < PEL ( $25 - 50 \mu\text{g}/\text{m}^3$ )	Every 6 Months
> Action Level > $50 \mu\text{g}/\text{m}^3$	Every 3 Months

The employer shall reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level or the Permissible Exposure Limit (PEL).

## 3. Termination of Exposure Monitoring:

Periodic exposure monitoring may be discontinued if results from two consecutive sampling periods taken at least 7 days apart show that employee exposure is below the Action level.

## C. Sampling Records

Monitoring records shall include the following:

- The date, number, duration, location, and results of each of the samples taken, including a description of the sampling procedure used to determine representative exposure, where applicable
- A description of the sampling and analytical methods used
- The type of respiratory protective devices, if any
- Name and job classification of the employee/student monitored
- Any environmental variables that could affect the measurement of the employee/student exposure

#### **D. Reporting of exposure monitoring results**

EH&S will notify the department/supervisor of exposure monitoring results within as soon as the final analysis is completed. The department/supervisor must provide this information to the affected employee(s) within 15 business days.

If levels are measured during the exposure monitoring exceeding the PEL, the EH&S report will include steps and controls to reduce exposure to below the PEL.

Follow up exposure monitoring may be necessary if engineering or administrative controls are put in place to reduce hazardous exposures.

#### **E. Housekeeping**

Follows housekeeping procedures established by their department:

##### **1. Prohibited: Dry Sweeping**

Do not use dry sweeping or dry brushing where there is a potential to expose themselves or others to silica dust.

##### **2. Prohibited: Compressed Air**

Do not use compressed air to clean clothing or surfaces unless used with a ventilation system that effectively captures the dust cloud.

#### **F. Signage**

Supervisors must establish regulated areas wherever employee exposure to silica is expected to exceed the PEL.

Regulated areas must be demarcated from the rest of the workplace in a manner to minimize the number of employees exposed to silica.

In regulated areas where exposure to silica dust may exceed the PEL the following type of signage must be in place to warn employee of hazards.



Access to regulated areas is restricted to employees required to perform work in the area, personnel conducting exposure monitoring, or other personnel as approved by supervisors and EH&S.

#### **E. Medical Surveillance**

Employees exposed to silica levels above the Permissible Exposure Limit ( $50 \mu\text{g}/\text{m}^3$ ), or any employee working with silica who develops signs/symptoms of excessive exposure, should be enrolled in the Medical Surveillance Program.

Medical surveillance is provided at no cost to the employee. All medical surveillance will be performed and results must be provided the affected employee and their supervisor within 15 days of the assessment. The medical surveillance program consists of baseline examination and chest X-ray.

Employees enrolled in the medical surveillance program should be examined annually to track any changes as a result to exposure to silica dust.

### **IX. RECORD KEEPING**

Records which are to be maintained by EH&S include:

- Records of medical evaluations
- Records of qualitative and quantitative fit testing
- Employee training records
- Employee exposure monitoring data
- A written copy of this respiratory protection program

Records which are to be maintained by each department:

- Signed copies of Attachment D for any employees or students using respirators voluntarily

## **X. TRAINING**

Employee training records shall be maintained by EH&S.

### **A. Respiratory Protection Training**

TWU employees who are required to use respirators must be trained on this respiratory protection program including at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- Limitations and capabilities of the respirator
- 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 assigned respirator
- Procedures for maintenance and storage of the respirator
- How to recognize important medical signs regarding use of respirators

Retraining shall occur annually, or when:

- Any changes in the workplace or the type of respirator used renders the 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

### **B. Silica Awareness Training**

Silica Awareness Training is available online at <https://twu.edu/health-safety/training/> and must be offered to affected employees prior to working with silica and annually thereafter.

Silica awareness training should include the following:

- Information about the potential health effects and symptoms of exposure to respirable silica
- The purpose and set up of regulated areas to mark the boundaries of work areas containing silica dust
- The use of engineering controls, work practices, good housekeeping, and PPE to control exposure to silica
- Expected exposures to silica dust
- Exposure monitoring process
- Medical surveillance process

## **XI. PROGRAM EVALUATION**

This program must be reevaluated at least annually to ensure that it is being effectively implemented. Such evaluations will take into consideration any changes that may have occurred in the workplace, as well as consultations with employees required to use respirators regarding their views on the program's effectiveness. Factors to consider when evaluating program effectiveness include:

- Respirator fit
- Appropriate respirator selection
- Proper respirator use
- Proper respirator maintenance

The date of this program will be updated in the page footers to reflect the most recent annual program evaluation.

## ATTACHMENT A

### REQUIRED RESPIRATORY PROTECTION EQUIPMENT

Respiratory Hazard (Chemical/ Material)	Source (area, equipment, or work activity)	Measured Exposure Levels (TWA)	Exposure Limits (PEL, TLV, or REL)	Required Respiratory Protection Equipment	Cartridge Change Schedule
Paints, primers, solvents/thinners, and activators	Painting Booth in FMC Service Center	Regular measurements showing exceedances of PEL, but usually below half mask permissible levels	Various, including the following (refer to SDS for product in use): <ul style="list-style-type: none"> <li>• Methanol: 200 ppm</li> <li>• Toluene: 20 ppm</li> <li>• Xylene: 20 ppm</li> <li>• Isobutyl Acetate: 150 ppm</li> <li>• Ethylbenzene: 20 ppm</li> </ul>	Tight-fitting respirator with organic vapor cartridge and N95 dust/mist pre-filter	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )
Resin casting products (resins, activators, etc.)	Sculpture Area of Fine Arts	Additional sampling needed	Products to be reviewed when used next.	Tight-fitting respirator with organic vapor cartridge and N95 dust/mist pre-filter	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )
Metal dusts and fumes	Welding/ brazing/ plasma cutting	<0.022 mg/m <sup>3</sup>	Total Dust: 15 mg/m <sup>3</sup> Respirable: 5 mg/m <sup>3</sup> (PEL)	Optional use of filtering facepiece dust mask or tight- fitting respirator with dust cartridge; dust cartridge or facepiece should meet NIOSH N95, R95, P95, N100, R100, or P100 standards	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )
Sandblasting dust	Sandblasting Equipment in Fine Arts	<0.042 mg/m <sup>3</sup>	Total Dust: 15 mg/m <sup>3</sup> Respirable: 5 mg/m <sup>3</sup> (PEL) Resp. Silica dust: 10 mg/m <sup>3</sup>	Optional use of filtering facepiece dust mask or tight- fitting respirator with dust cartridge; dust cartridge or facepiece should meet NIOSH N95, R95, P95, N100, R100, or P100 standards	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )

Respiratory Hazard (Chemical/ Material)	Source (area, equipment, or work activity)	Measured Exposure Levels (TWA)	Exposure Limits (PEL, TLV or REL)	Required Respiratory Protection Equipment	Cartridge Change Schedule
Paints, primers, solvents/thinners, and activators	Fine Arts Outdoor Spray Booth	Additional sampling needed	Various, including the following (refer to SDS for product in use): <ul style="list-style-type: none"> <li>• Methanol: 200 ppm</li> <li>• Toluene: 20 ppm</li> <li>• Xylene: 20 ppm</li> <li>• Isobutyl Acetate: 150 ppm</li> <li>• Ethylbenzene: 20 ppm</li> </ul>	Tyvek Hood with Grade D supplied air	Listed in the Breathable Air section ( <a href="#">Section VII C</a> )
Ceramics dust from clay mixing	Ceramics Area in Fine Arts	Hourly average* of 251 µg/m <sup>3</sup>  <small>Based on 2019 measurements</small>	Total Dust: 15 mg/m <sup>3</sup> Respirable: 5 mg/m <sup>3</sup> (PEL)  Resp. Silica dust: Action level- 25 µg/m <sup>3</sup> PEL - 50 µg/m <sup>3</sup>	Use of filtering facepiece dust mask or tight-fitting respirator with dust cartridge; dust cartridge or facepiece should meet NIOSH N95, R95, P95, N100, R100, or P100 standards	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )
Crystalline silica dust	Cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick, block & mortar; sandblasting, mixing concrete, etc.	Assuming a max silica percentage of 68%; the average for mixing clay was 1,255 ug and the max was 98,956 ug.	Action level- 25 µg/m <sup>3</sup> PEL - 50 µg/m <sup>3</sup>	Dependent upon task; most tasks have a requirement for APF 10- disposable respirators and half face reusable respirators; some tasks require APF 25- PAPRs and M-307 Respiratory Hardhat	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> )

DPS emergency response (discontinued in 2023)	Chemical, biological, or radiological attacks and other emergencies	N/A <i>(measurements may or may not be collected at the time of the incident by EH&amp;S/Safety Officer)</i>	Dependent on material in question. DPS personnel must minimize exposure as much as possible. Leave affected areas whenever possible until information about contaminant and concentration is available.	NBC or CBRN, dual-lens, full face respirator with enforcement cartridge (AM/CD/CL/FM/HC/HF/MA/SD/HE/OV/CN/CS/PH/P100)	Avoid contaminated areas to the maximum extent possible. Follow default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> ) unless more frequent changes are mandated by EH&S/Safety Officer
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Respiratory Hazard (Chemical/ Material)	Source (area, equipment, or work activity)	Measured Exposure Levels (TWA)	Exposure Limits (PEL, TLV or REL)	Required Respiratory Protection Equipment	Cartridge Change Schedule
Legionella bacteria	Maintenance or cleaning of Cooling Towers	N/A	Dependent on concentration of bacteria in aerosols	Half-face respirator equipped with a HEPA (or similar) filter capable of effectively collecting particles of 1- micrometer; can use N-100 or P-100 cartridges	Cartridges must not be used for more than one day. Follow default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> ) for additional information.
Laboratory animal allergens	Dumping of animal cage bedding (when downdraft is unavailable)	N/A	Dependent on number of protein particles	N-95	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> ) per the filtering facepieces change schedule
Boiler cleaning	Maintenance of Central Plant boilers (grinding soot and mortar)	Variable; sampling in November 2022 for 1 hour of work resulted in a 3.2625 mg/m <sup>3</sup> TWA	Carbon black: NIOSH REL TWA 3.5 mg/m <sup>3</sup> OSHA PEL TWA 3.5 mg/m <sup>3</sup>  Nuisance respirable dusts: OSHA PEL TWA 5 mg/m <sup>3</sup>	Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100	Default change schedule listed in the Cartridge & Filtering Facepiece Change Schedules section ( <a href="#">Section VII B 5</a> ) per the filtering facepieces change schedule

**ATTACHMENT B****OSHA Respirator Medical Evaluation Questionnaire**  
(29 CFR 1910.134 Appendix C)**To the employer:**

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

**To the employee:**

Can you read (circle one)? Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

**Part A. Section 1.** (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator. Please print.

1. Today's date: \_\_\_\_\_
  2. Your name: \_\_\_\_\_
  3. Your age (to nearest year): \_\_\_\_\_
  4. Sex (circle one): Male/Female
  5. Your height: \_\_\_\_\_ ft. \_\_\_\_\_ in.
  6. Your weight: \_\_\_\_\_ lbs.
  7. Your job title: \_\_\_\_\_
  8. Phone number where you can be reached by the health care professional who reviews this questionnaire (include the area code): \_\_\_\_\_
  9. Best time to call you at this number: \_\_\_\_\_
  10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
  11. Check the type of respirator you will use (you can check more than one category):
    - a. \_\_\_\_\_ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
    - b. \_\_\_\_\_ Other type (for example, half-or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
  12. Have you worn a respirator (circle one): Yes/No
- If "yes," what type(s): \_\_\_\_\_

**Part A. Section 2.** [MANDATORY] Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No
2. Have you ever had any of the following conditions?
  - a. Seizures (fits): Yes/No
  - b. Diabetes (sugar disease): Yes/No
  - c. Allergic reactions that interfere with your breathing: Yes/No
  - d. Claustrophobia (fear of closed-in places): Yes/No
  - e. Trouble smelling odors: Yes/No
3. Have you ever had any of the following pulmonary or lung problems?
  - a. Asbestosis: Yes/No
  - b. Asthma: Yes/No
  - c. Chronic bronchitis: Yes/No

- d. Emphysema: Yes/No
  - e. Pneumonia: Yes/No
  - f. Tuberculosis: Yes/No
  - g. Silicosis: Yes/No
  - h. Pneumothorax (collapsed lung): Yes/No
  - i. Lung cancer: Yes/No
  - j. Broken ribs: Yes/No
  - k. Any chest injuries or surgeries: Yes/No
  - l. Any other lung problem that you've been told about: Yes/No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
- a. Shortness of breath: Yes/No
  - b. Short of breath when walking fast on level ground or walking up a slight hill/incline: Yes/No
  - c. Short of breath when walking with other people at an ordinary pace on level ground: Yes/No
  - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
  - e. Shortness of breath when washing or dressing yourself: Yes/No
  - f. Shortness of breath that interferes with your job: Yes/No
  - g. Coughing that produces phlegm (thick sputum): Yes/No
  - h. Coughing that wakes you early in the morning: Yes/No
  - i. Coughing that occurs mostly when you are lying down: Yes/No
  - j. Coughing up blood in the last month: Yes/No
  - k. Wheezing: Yes/No
  - l. Wheezing that interferes with your job: Yes/No
  - m. Chest pain when you breathe deeply: Yes/No
  - n. Any other symptoms that you think may be related to lung problems: Yes/No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: Yes/No
  - b. Stroke: Yes/No
  - c. Angina: Yes/No
  - d. Heart failure: Yes/No
  - e. Swelling in your legs or feet (not caused by walking): Yes/No
  - f. Heart arrhythmia (heart beating irregularly): Yes/No
  - g. High blood pressure: Yes/No
  - h. Any other heart problem that you've been told about: Yes/No
6. Have you ever had any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: Yes/No
  - b. Pain or tightness in your chest during physical activity: Yes/No
  - c. Pain or tightness in your chest that interferes with your job: Yes/No
  - d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
  - e. Heartburn or indigestion that is not related to eating: Yes/ No
  - f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No
7. Do you currently take medication for any of the following problems?
- a. Breathing or lung problems: Yes/No
  - b. Heart trouble: Yes/No
  - c. Blood pressure: Yes/No
  - d. Seizures (fits): Yes/No
8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9: \_\_\_\_\_)
- a. Eye irritation: Yes/No
  - b. Skin allergies or rashes: Yes/No

- c. Anxiety: Yes/No
  - d. General weakness or fatigue: Yes/No
  - e. Any other problem that interferes with your use of a respirator: Yes/No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

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

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No
11. Do you currently have any of the following vision problems?
- a. Wear contact lenses: Yes/No
  - b. Wear glasses: Yes/No
  - c. Color blind: Yes/No
  - d. Any other eye or vision problem: Yes/No
12. Have you ever had an injury to your ears, including a broken ear drum: Yes/No
13. Do you currently have any of the following hearing problems?
- a. Difficulty hearing: Yes/No
  - b. Wear a hearing aid: Yes/No
  - c. Any other hearing or ear problem: Yes/No
14. Have you ever had a back injury: Yes/No
15. Do you currently have any of the following musculoskeletal problems?
- a. Weakness in any of your arms, hands, legs, or feet: Yes/No
  - b. Back pain: Yes/No
  - c. Difficulty fully moving your arms and legs: Yes/No
  - d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
  - e. Difficulty fully moving your head up or down: Yes/No
  - f. Difficulty fully moving your head side to side: Yes/No
  - g. Difficulty bending at your knees: Yes/No
  - h. Difficulty squatting to the ground: Yes/No
  - i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
  - j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

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

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

If “yes,” do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you’re working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If “yes,” name the chemicals if you know them:

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

- a. Asbestos: Yes/No
- b. Silica (e.g., in sandblasting, concrete mixing): Yes/No
- c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No
- d. Beryllium: Yes/No
- e. Aluminum: Yes/No
- f. Coal (for example, mining): Yes/No
- g. Iron: Yes/No
- h. Tin: Yes/No
- i. Dusty environments: Yes/No
- j. Cooling towers: Yes/No
- k. Any other hazardous exposures: Yes/No

If "yes," describe these exposures: \_\_\_\_\_

4. List any second jobs or side businesses you have: \_\_\_\_\_

5. List your previous occupations: \_\_\_\_\_

6. List your current and previous hobbies: \_\_\_\_\_

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat):  
Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications (if you know them): \_\_\_\_\_

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

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

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

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

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

- a. Light (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:

\_\_\_\_\_hrs. \_\_\_\_\_mins.

*Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.*

- b. Moderate (200 to 350 kcal per hour): Yes/No

If “yes,” how long does this period last during the average shift:

\_\_\_\_\_hrs. \_\_\_\_\_mins.

*Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.*

c. Heavy (above 350 kcal per hour): Yes/No

If “yes,” how long does this period last during the average shift:

\_\_\_\_\_hrs. \_\_\_\_\_mins.

*Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).*

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

If “yes,” describe this protective clothing and/or equipment:

\_\_\_\_\_

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

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

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

\_\_\_\_\_

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

\_\_\_\_\_

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

Name of the first toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the second toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the third toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

The name of any other toxic substances that you’ll be exposed to while using your respirator: \_\_\_\_\_

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

\_\_\_\_\_

### ATTACHMENT C

1926.1153(c)(1)- Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(ii) Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system Operate and maintain tool in accordance with	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency		
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	APF 10	APF 10
(v) Drivable saws	For tasks performed outdoors only:		
	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(vi) Rig-mounted core saws	Use tool equipped with integrated water delivery system that supplies water to cutting surface	None	None



Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
or drills	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism Use a HEPA-filtered vacuum when cleaning holes	None	None
(viii) Dowel drilling rigs for concrete	For tasks performed outdoors only:		
	Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism	APF 10	APF 10
(ix) Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	OR		
	Operate from within an enclosed cab and use water for dust suppression on drill bit	None	None
(x) Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
	OR		
	Use tool equipped with commercially available shroud and dust collection system		
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with		

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	99% or greater efficiency and a filter-cleaning mechanism:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
(xi) Handheld grinders for mortar removal ( <i>i.e.</i> , tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system	APF 10	APF 25
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism		
(xii) Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	OR		
	Use grinder equipped with commercially available shroud and dust collection system		
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism:		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	None	APF 10
(xiii) Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	OR		
	Use machine equipped with dust collection system recommended by the manufacturer	None	None
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism		
	When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes		
(xiv) Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	Operate and maintain machine to minimize dust emissions		
(xv) Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust	None	None
	Operate and maintain machine to minimize dust emissions		
	For cuts of four inches in depth or less on any substrate:		
	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust	None	None
	Operate and maintain machine to minimize dust emissions		
	OR		
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
	Operate and maintain machine to minimize dust emissions		
(xvi) Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points)	None	None
	Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions		
	Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station		
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab	None	None
	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions	None	None

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
	OR		
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None	None



## ATTACHMENT D

### *Information for Employees Using Respirators When Not Required Under the Standard* (29 CFR 1910.134 Appendix D)

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Información Para los Empleados Que Usan los Respiradores Cuando No lo Exige el  
Reglamento o Norma*

(29 CFR 1910.134 Apéndice D)

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

Usted debe hacer lo siguiente:

1. Lea y haga caso a las instrucciones que provee el fabricante en el uso, mantenimiento, limpieza y cuidado, y las advertencias en cuanto a las limitaciones de los respiradores.
2. Escoja respiradores certificados contra los contaminantes que le interesa. La Institución Nacional para la Seguridad y Salud Ocupacional (NIOSH) del Departamento de Salud y Servicios Humanos de los Estados Unidos de América, son los que certifican los respiradores. Una etiqueta o certificado de exposición debe aparecer en el respirador o en el empaque del respirador. Este debe decirle para que químicos fue hecho y cuanto le va a proteger.
3. No use su respirador en atmósferas que contienen contaminantes para los cuales no fue diseñado porque no le va a proteger. Por ejemplo, si un respirador es diseñado para filtrar partículas de polvo no le va a proteger contra gases, vapores o partículas solidas de vaho (mal olor) o humo.
4. No pierda de vista su respirador para que así no use el respirador de otra persona por equivocación.

Nombre: \_\_\_\_\_ Firma: \_\_\_\_\_ Fecha: \_\_\_\_\_