Occupational Exposure to Respirable Crystalline Silica - Construction
FOR
Dee Cramer, Inc.

Introduction and Purpose

This program is intended to apply to all employees of (Dee Cramer, Inc.) hereto referred to as **the Company**. Exposure to respirable crystalline silica can cause silicosis, lung cancer, other respiratory diseases, and kidney disease.

Exposure can occur during common construction tasks such as using masonry saws, grinders, drills, jackhammers, and handheld powered chipping tools; operating vehicle-mounted drilling rigs; milling; and using heavy equipment for demolition or certain other tasks.

In 2016, the Federal Occupational Safety and Health Administration (OSHA) issued a new construction industry standard, *1926.1153 Respirable Crystalline Silica*, with requirements for exposure control, housekeeping, medical surveillance, training and information and recordkeeping (see Attachment A - *SMACNA Fact Sheet Major Provisions of the Final Standard for Occupational Exposure to Respirable Crystalline Silica)*.

The purpose of this program is to ensure the Company:

- Designates a competent person to oversee this program and make frequent and regular inspections of job sites, materials and equipment, and to implement a written exposure control plan.
- Establishes exposure control methods in accordance with 1926.1153 Table 1 (Attachment B of this document) as first priority and whenever feasible;
- Establishes an alternative means of assessing employee exposure to respirable crystalline silica when conformance with Table 1 is not feasible.
- Implements appropriate engineering, work practice controls and respiratory protection.
- Establishes appropriate medical surveillance programs as required.
- Provides employee training and information about potential health hazards of respirable crystalline silica.
- Maintains records of employee exposure assessment, medical surveillance, and training.

Duties and Responsibilities

The effectiveness of this program depends upon company specific implementation as well as active employee involvement through all levels of the organization.

Designated Competent Person

- Capable of identifying existing and predictable hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.

- Be familiar with the requirements of 1926.1153 Respirable Crystalline Silica.
- Work with project managers/site supervisors and foremen to identify tasks with potential exposure to respirable crystalline silica.
- Work with project managers/site supervisors and foremen to ensure that work with potential silica disturbance / exposure can be done using Table 1 as a first priority.
- Coordinate consultation with EHS professional for exposure assessment of any tasks outside those listed in Table 1.
- Coordinate medical surveillance provisions where necessary.
- Coordinate employee training and information.
- Review and modify this written program to reflect actual company exposures, controls, medical surveillance, training, and information.
- Perform periodic jobsite reviews to verify exposure controls are in place.

EHS Professional (Qualified Person)

- Whether in-house staff or outside consultant, this individual is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work, or the project.
- Oversee or conduct bulk sample collection, air monitoring, medical surveillance or other safety / industrial hygiene practices as needed to meet the requirements of the OSHA silica standard.

Project Manager

- Review projects with the Competent Person to evaluate potential exposures to respirable crystalline silica.
- Ensure exposure control provisions are included in the project work plan as determined by required review.
- Ensure project staff receives necessary training and information regarding health hazards, potential for exposure and safe work procedures relevant to the specific project.
- Ensure staff are equipped with necessary PPE, as well as specialized tools and equipment required for safe project completion.

Site Supervisor

- Ensure work is performed in accordance with appropriate control measures
- Responsible for monitoring site conditions, documenting and reporting changes or new situations that could potentially effect employee exposure to respirable crystalline silica.
- Coordinate efforts with the construction management / general contracting firm to ensure related (silica dust producing) hazards on multi-employer worksites are identified and corrected.
- Responsible for taking immediate corrective action and or stopping work if new hazards are observed or there is a change in conditions that negatively impacts employee safety or health (in consultation with the Competent Person, if needed).

Employees

- Conduct work tasks in a manner to minimize airborne silica dust, in accordance with established work procedures.
- Use tools and equipment properly.
- Wear provided personal protective equipment properly.
- Participate in training.
- Participate in medical surveillance program as necessary.
- Observe site conditions and report all safety concerns to the site supervisor.
- Report instances of potential overexposures to supervisor immediately.
- Share ideas for improvements in safe work practice

Exposure Control Methods

Potential for employee exposure to respirable crystalline silica will vary by task, materials, and work methods. The OSHA construction standard, *1926.1153 TABLE 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica* (Attachment B of this document), offers characterization of exposure and controls for common tasks.

The Company will prepare a written work plan for all tasks with the potential to generate silica dust. A helpful resource to develop this plan can be found at www.silicasafe.org.

When planning new projects, Table 1 should be reviewed to determine which tasks have potential for employee exposure. For tasks included in the Table, ensure work plans are established to incorporate the engineering and work practice controls and respiratory protection corresponding to the task. Listed tasks that follow associated control measures do not require further assessment by the employer.

In cases where tasks not listed in the Table are being performed, an exposure assessment must be conducted. Exposure assessment should include air monitoring to demonstrate the 8-hour time weighted average (TWA) exposure for each task.

Air monitoring data from previous similar projects may be considered along with other objective data that characterizes exposure (for example, studies performed by equipment manufacturers using specific work methods or equipment shown to control exposure).

Exposure Monitoring Requirements

- Not required if employer follows Table 1
- If initial monitoring results are below the Action level (25 ug/m^3) no further monitoring is required.
- If initial monitoring results are > than the Action Level (25 ug/m^3) and < Permissible Exposure Limit (50 ug/m^3) repeat monitoring every 6 months until two consecutive sets of data are below 25 ug/m^3.
- If initial monitoring results are above the Permissible Exposure Limit (>50 ug/m^3) monitoring must be repeated every 3 months.

Note:

All samples must be analyzed in accordance with OSHA 1926.1153.
Each affected employee must be notified of sample results within 5 working days after the exposure assessment is completed. Notification must include methods being taken to reduce exposures measured above 50 ug/m^3.

Engineering and Work Practice Controls

Engineering and work practice controls identified by task (Table 1) should be incorporated into site specific work plans. Additionally, provisions should be made to further control dust through use of exhaust ventilation, wet methods, and ongoing housekeeping to minimize accumulation of settled dust.

Requirements of other standards must still be followed as applicable, for example, 29 CFR 1926.57 (Ventilation), where abrasive blasting is conducted using crystalline silica containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

Access to work areas will be restricted to those employees trained in proper procedures and required to perform specific work function. Work areas will be restricted from general entry when activities create potential for exposure to respirable crystalline silica.

Multi-employer Worksites: The project manager and site supervisor should also be aware of any work on the project, conducted by other trades and contractors, that may disturb silica and/or create airborne silica dust. In consultation with the competent person, take appropriate action if there is a potential for exposure to the Company employees.

Respiratory Protection

Requirements for respiratory protection identified by task (Table 1) must be incorporated into site specific work plans.

If there are circumstances where Table 1 cannot be followed, the Competent Person will determine the need for respiratory protection based on employee exposure to respirable crystalline silica.

When tasks require use of respiratory protection, all provisions of OSHA's Respiratory Protection Standard (29 CFR 1910.134) must be followed. These include:

- Respirator selection
- Providing equipment at no cost to employees
- Medical evaluation
- Fit testing
- Use, maintenance, and care
- Training and information

Major Requirements of OSHA's Respiratory Protection Standard 29 CFR 1910.134 is located in Attachment C. The SMACNA website provides a model Respiratory Protection Program that may be utilized by member companies who need to implement a program.

Housekeeping

No dry sweeping or brushing should be done in areas containing silica dust or debris as these activities may create an un-necessary employee exposure. Similarly, compressed air should not be used for cleaning work areas, tools, equipment, or clothing containing silica dust or debris.

Work-plans should include provisions for wet cleaning methods to minimize airborne dust or, preferably, use of HEPA filtered vacuum cleaners.

Medical Surveillance

Each employee required to wear a respirator 30 or more days per year is to be included in a medical surveillance program to include a medical examination performed by a physician or other licensed healthcare professional (PLHCP). Initial medical examination must be done within 30 days of assignment unless there is documentation that the employee has had a medical examination that meets the requirements of the standard within the past 3 years.

Periodic examinations must be performed every 3 years or more frequently if recommended by the PLHCP.

Requirements of Medical Examination

The examination shall consist of:

(i) A medical and work history, with emphasis on: past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;

(ii) A physical examination with special emphasis on the respiratory system.

(iii) A chest X-ray (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labor Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader;

(iv) A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;

(v) Testing for latent tuberculosis infection; and

(vi) Any other tests deemed appropriate by the PLHCP.

The PLHCP must be provided the following information:

- A copy of 1926.1153.
- A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica;
- The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica.
- A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment.
- Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the employer

Within 30 days following examination the PLHCP must provide the employee a written report that includes the following information:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment.

- Any recommended limitations on the employee's use of respirators.
- Any recommended limitations on the employee's exposure to respirable crystalline silica; and
- A statement that the employee should be examined by a specialist if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

The PLHCP must also provide the company a written medical opinion within 30 days of completing employee medical examinations. This written medical opinion must be shared with the referenced employee (each employee should be provided information pertaining to him/her only). Information included by the PLHCP in this report is as follows:

- The date of the examination.
- A statement that the examination has met the requirements of 1926.1153
- Any recommended limitations on the employee's use of respirators.

If the employee provides written authorization, the written opinion shall also contain either or both of the following:

- Any recommended limitations on the employee's exposure to respirable crystalline silica.

- A statement that the employee should be examined by a specialist if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

Recommendations regarding referral to a specialist must be followed up (appointment scheduled) within 30 days. The specialist must be given all information originally provided to the PLHCP. The specialist must provide reports to both the employee and company, as described above for the PLHCP, within 30 days of the examination.

Communication of Respirable Crystalline Silica Hazards to Employees

The company's hazard communication program (29 CFR 1910.1200 / 29 CFR 1926.59) should be updated as necessary to include information regarding crystalline silica. For example, ensure products containing crystalline silica are appropriately labelled and Safety Data Sheets for the products are available.

Employees with potential exposure to respirable crystalline silica must receive information and training explaining the contents and availability of 1926.1153 and the following:

- The health hazards associated with exposure to respirable crystalline silica
- Specific tasks in the workplace (as determined by review of Table 1 or other exposure assessment) that could result in exposure to respirable crystalline silica.

- Specific measures the employer has implemented to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used
- The name and contact information of the competent person
- An explanation of the company medical surveillance program.

Recordkeeping

The following records are required to be maintained and made available in accordance with 29 CFR 1910.1020:

1. Air monitoring data:

    - The date of measurement for each sample taken.
    - The task monitored.
    - Sampling and analytical methods used.
    - Number, duration, and results of samples taken.
    - Identity of the laboratory that performed the analysis.
    - Type of personal protective equipment, such as respirators, worn by the employees monitored; and
    - Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were monitored

2. Objective data used for exposure assessment:

    - The crystalline silica-containing material in question.
    - The source of the objective data.
    - The testing protocol and results of testing.
    - A description of the process, task, or activity on which the objective data were based; and
    - Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

3. Medical surveillance for each employee to include:

    - Name and social security number.
    - A copy of the PLHCPs' and specialists' written medical opinions; and
    - A copy of the information provided to the PLHCPs and specialists.

Employee training records and documentation of periodic jobsite review should also be maintained as a best practice and documentation of program implementation.

Attachment A

SMACNA FACT SHEET
MAJOR PROVISIONS OF THE FINAL STANDARD FOR OCCUPATIONAL EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA

Scope	All exposures to respirable crystalline silica except: Exposure will remain below 25 micrograms per cubic meter of air (25 µg/m^3) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.
Effective Dates	June 23, 2016
Compliance Deadline	Construction employers have until June 23, 2017, to meet the requirements.
Permissible Exposure Limit (PEL)	50 micrograms per cubic meter of air (50 µg/m^3) 8 hr-TWA
Action Level (AL)	25 micrograms per cubic meter of air (25 µg/m^3) 8 hr-TWA
Specified Exposure Control Methods	1. Employers may follow control methods and respiratory protection requirements outlined in Table 1 (1926.1153(c)(1)) - attached. 2. Assess employees' exposure to respirable crystalline silica and establish control measures to maintain exposure below the PEL **Note: Employers who properly implement provisions of Table 1 are not required to measure employee exposure to silica.**
Exposure Monitoring	• Initial *(Not required if utilizing Table 1 or if the employer has objective historical data to accurately characterize employee exposure)* • Every 3 mos. If > PEL (50 ug/m^3) • Every 6 mos. If ≥ AL (25 ug/m^3) and < PEL • Discontinue if < AL
Methods of Compliance	1. Feasible engineering and work practice controls to include compliance with other OSHA standards such as abrasive blasting 2. Respiratory protection in accordance with 1926.1153(e) and 1910.134.
Housekeeping	1. Dry sweeping or other activity that may expose employees to silica is prohibited unless wet sweeping, HEPA vacuuming or other methods that minimize the likelihood of exposure are not feasible. 2. Use of compressed air for cleaning is prohibited unless it is used in conjunction with a ventilation system that effectively captures the dust created by the compressed air.
Written Exposure Control Plan	1. Employers must establish a written exposure control plan that

	• describes the tasks involving exposure to respirable silica; • describes controls, work practices and respiratory protection used to limit employee exposure to respirable crystalline silica for each task; • describes the housekeeping measures used to limit employee exposure to respirable crystalline silica; • describes the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by others. 2. The written plan must be reviewed and evaluated annually and updated as necessary. 3. The written plan must be available to employees and their representatives. 4. The employer shall designate a competent person to make frequent and regular inspections of job sites, materials and equipment, and to implement the written exposure control plan.
Medical Surveillance	Medical assessment for employees who are required to wear a respirator 30 or more days per year. The exam must include: • Medical and work history • Physical exam with emphasis on the respiratory system (chest x-ray, pulmonary function test and testing for tuberculosis). • Exams must be repeated at least every 3 years.
Communication of respirable crystalline silica hazards to employees	1. Crystalline silica must be included in the employer's hazard communication program (29 CFR 1910.1200) to include training and information, labelling and safety data sheets for products containing crystalline silica. 2. Information and training must include: • health hazards associated with exposure to respirable crystalline silica; • Specific tasks in the workplace that could result in exposure to respirable crystalline silica; • Specific methods the employer has established to control exposure; • The identity of the competent person who monitors the program; • Medical surveillance

Attachment B

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA

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 hrs/shift	**>4 hrs/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 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	None	None

(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 or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(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	APF 10	APF 10

	99% or greater efficiency and a filter cleaning mechanism Use a HEPA-filtered vacuum when cleaning holes		
(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
	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 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.e.*, 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

	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
	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
	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
	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
xviii) Heavy equipment and	Apply water and/or dust suppressants as necessary to minimize dust emissions	None	None

utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	OR		
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None	None

MAJOR REQUIREMENTS OF OSHA'S RESPIRATORY PROTECTION STANDARD 29 CFR 1910.134

OSHA Office of Training and Education
Rev. December 2006

This document discusses the major requirements of OSHA's Respiratory Protection Standard, 29 CFR 1910.134.

No attempt has been made to discuss every detail of the standard. Readers are encouraged to consult OSHA's Respiratory Protection web page for the complete text.

MAJOR REQUIREMENTS OF 29 CFR1910.134

Introduction

- This standard applies to General Industry (Part 1910), Shipyards (Part 1915), Marine Terminals (Part 1917), Longshoring (Part 1918), and Construction (Part 1926).

(a) Permissible Practice

- Paragraph (a)(1) establishes OSHA's **hierarchy of controls** by requiring the use of **feasible engineering controls** as the primary means to control air contaminants. Respirators are required when **"**effective engineering controls are not feasible, or while they are being instituted.**"**

- Paragraph (a)(2) requires employers to provide employees with respirators that are **"**applicable and suitable**"** for the purpose intended **"**when such equipment is necessary to protect the health of the employee.**"**

(b) Definitions

This paragraph contains definitions of important terms used in the regulatory text.

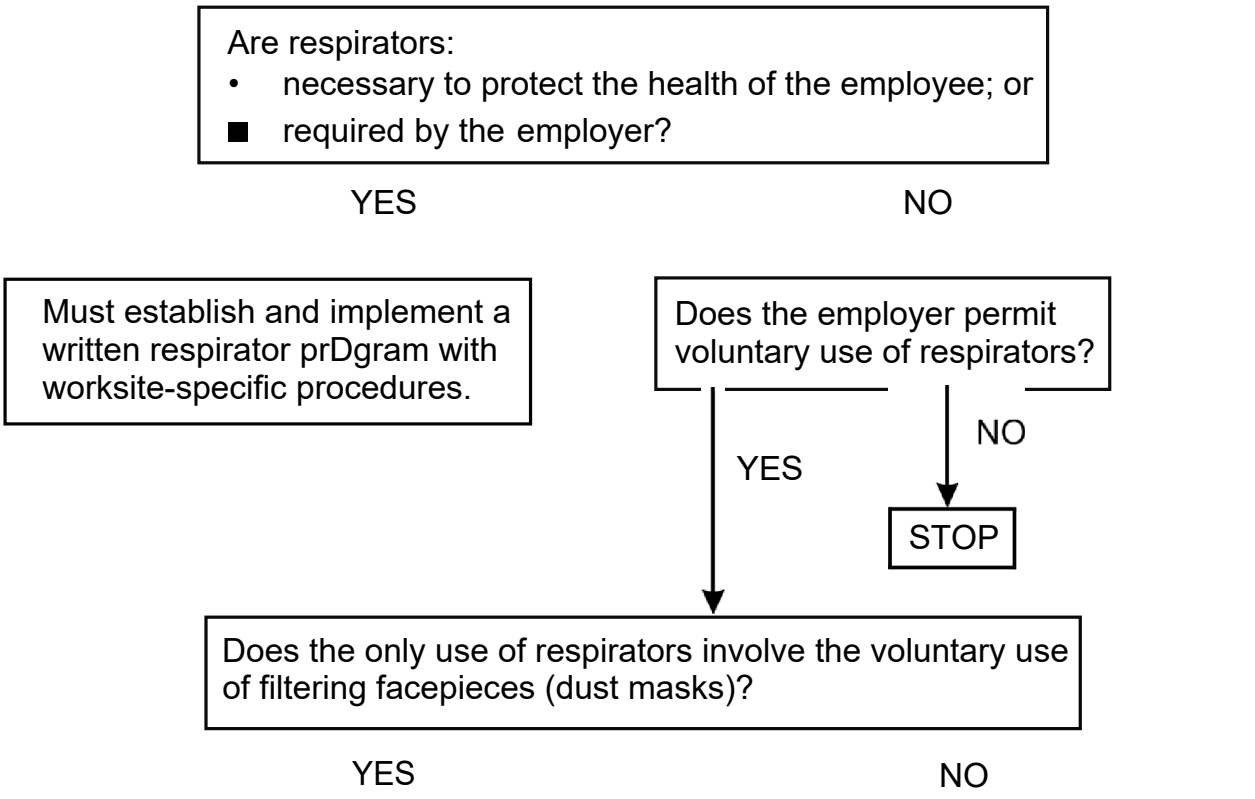
(c) Respiratory Protection Program

- Must designate a **qualified program administrator** to oversee the program.

- Must provide respirators, training, and medical evaluations **at no cost to the employee**.

- OSHA has prepared a *Small Entity Compliance Guide* that contains criteria for selection of a program administrator and a sample program.

Respirator-Use Requirements Flow Chart
29 CFR I 9J0.134(c)



- Employer determines that the respirator itself does not create a hazard.
- Must provide users with information contained in Appendix D.
- ■ No respirator program required.

- Employer determines that the respirator itself does not create a hazard.
- ■ Must provide users with information contained in Appendix D.
- Must establish and implement those elements of a written respirator program necessary to ensure that

(d) Selection of Respirators

- Must select a respirator **certified by the National Institute for Occupational Safety and Health (NIOSH)** which must be used in compliance with the conditions of its certification.

- Must identify and evaluate the respiratory hazards in the workplace, including a reasonable estimate of employee exposures and identification of the contaminant's chemical state and physical form.

- Where exposure cannot be identified or reasonably estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH).

- Respirators for IDLH atmospheres:
  - Approved respirators:
    - full facepiece pressure demand self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes, or
    - combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
  - All **oxygen-deficient atmospheres (less than 19.5% O_2 by volume)** shall be considered IDLH.
    Exception: If the employer can demonstrate that, under all foreseeable conditions, oxygen levels in the work area can be maintained within the ranges specified in Table II (i.e., between 19.5% and a lower value that corresponds to an altitude-adjusted oxygen partial pressure equivalent to 16% oxygen at sea level), then *any* atmosphere-supplying respirator may be used.

- Respirators for non-IDLH atmospheres:
  - Employers must use the **assigned protection factors (APFs)** listed in Table 1 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), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.
  - Must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the **maximum use concentration (MUC)**.
    - Must not apply MUCs to conditions that are IDLH; instead must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.
    - When the calculated MUC exceeds the IDLH level or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.
    - The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

- For protection against gases and vapors, the employer shall provide:
  - an atmosphere-supplying respirator, or
  - an air-purifying respirator, provided that:
    - the respirator is equipped with an **end-of-service-life indicator (ESLI)** certified by NIOSH for the contaminant; or
    - if there is no ESLI appropriate for conditions of the employer's workplace, the employer implements a **change schedule** for canisters and cartridges that will ensure that they are changed before the end of their service life and describes in the respirator program the information and data relied upon and basis for the change schedule and reliance on the data.
- For protection against particulates, the employer shall provide:
  - an atmosphere-supplying respirator; or
  - an air-purifying respirator equipped with high efficiency particulate air (HEPA) filters certified by NIOSH under 30 CFR Part 11 or with filters certified for particulates under 42 CFR Part 84; or
  - an air-purifying respirator equipped with any filter certified for particulates by NIOSH for contaminants consisting primarily of particles with mass median aerodynamic diameters of at least 2 micrometers.

(e) Medical Evaluation

- Must provide a medical evaluation to determine employee's ability to use a respirator, **before fit testing and use**.

- Must identify a **physician or other licensed health care professional (PLHCP)** to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire (information required is contained in mandatory Appendix C).

- Must obtain a **written recommendation** regarding the employee's ability to use the respirator from the PLHCP.

- Additional medical evaluations are required under certain circumstances, e.g.:
  - employee reports medical signs or symptoms related to ability to use respirator;
  - PLHCP, program administrator, or supervisor recommends reevaluation;
  - information from the respirator program, including observations made during fit testing and program evaluation, indicates a need; or
  - change occurs in workplace conditions that may substantially increase the physiological burden on an employee.

- Annual review of medical status is not required.

(f) Fit Testing

- All employees using a **negative or positive pressure tight-fitting facepiece** respirator must pass an appropriate **qualitative fit test (QLFT**) or **quantitative fit test (QNFT).**

- Fit testing is required prior to initial use, whenever a different respirator facepiece is used, and **at least annually thereafter**. An additional fit test is required whenever the employee reports, or the employer or PLHCP makes visual observations of, changes in the employee's physical condition that could affect respirator fit (e.g., facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight).

- The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol, as contained in mandatory Appendix A.
  - QLFT Protocols:
    - Isoamyl acetate
    - Saccharin
    - Bitrex
    - Irritant smoke

- QNFT Protocols:
  - Generated Aerosol (corn oil, salt, DEHP)
  - Condensation Nuclei Counter (PortaCount)
  - Controlled Negative Pressure (Dynatech FitTester 3000)
  - Controlled Negative Pressure (CNP) REDON

- QLFT may only be used to fit test negative pressure air-purifying respirators (APRs) that must achieve a fit factor of 100 or less.

- If the fit factor determined through QNFT is ≥100 for tight-fitting half facepieces, or ≥500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

Note: If a particular OSHA standard (e.g., 29 CFR 1910.1001 Asbestos) requires the use of a full facepiece APR capable of providing protection in concentrations up to 50 times the Permissible Exposure Limit (PEL), this respirator must be QNFT. This is because a protection factor of 50 (50 X PEL) multiplied by a standard safety factor of 10 is equivalent to a fit factor of 500.

The safety factor of 10 is used because protection factors in the workplace tend to be much lower than the fit factors achieved during fit testing. The use of a safety factor is a standard practice supported by most experts to offset this limitation. This is discussed in the record at 63 FR 1225.

(g) Use of Respirators

- Tight-fitting respirators shall not be worn by employees who have facial hair or any condition that interferes with the face-to-facepiece seal or valve function.

- Personal protective equipment shall be worn in such a manner that does not interfere with the seal of the facepiece to the face of the user.

- Employees shall perform a user seal check **each time they put on a tight-fitting respirator** using the procedures in mandatory Appendix B-1 or equally effective manufacturer's procedures.

- Procedures for respirator use in IDLH atmospheres are stated. In addition to these requirements, interior structural firefighting requires the use of SCBAs and a protective practice known as "2-in/2-out" — at least two employees must enter and remain in visual or voice contact with one another at all times, and at least two employees must be located outside. (Note that this is not meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.)

(h) Maintenance and Care of Respirators

Must clean and disinfect respirators using the procedures in Appendix B-2, or equally effective manufacturer's procedures at the following intervals:

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

(i) Breathing Air Quality and Use

Compressed breathing air shall meet the requirements for Type 1-Grade D breathing air as described in ANSI/CGA *Commodity Specification for Air*, G-7.1-1989.

(j) Identification of Filters, Cartridges, and Canisters

- All filters, cartridges, and canisters used in the workplace must be labeled and color coded with the NIOSH approval label.
- The label must not be removed and must remain legible.

(k) Training and Information

- Must provide effective training to respirator users, including:
  - why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator
  - limitations and capabilities of the respirator
  - use in emergency situations
  - how to inspect, put on and remove, use and check the seals
  - procedures for maintenance and storage
  - recognition of medical signs and symptoms that may limit or prevent effective use
  - general requirements of this standard
- Training required prior to initial use, unless acceptable training has been provided by another employer within the past 12 months.
- **Retraining required annually** and when:
  - workplace conditions change,
  - new types of respirator are used, or
  - inadequacies in the employee's knowledge or use indicates need.

- The basic advisory information in Appendix D shall be provided to employees who wear respirators when their use is not required.

(l) Program Evaluation

Employer must conduct evaluations of the workplace as necessary to ensure proper implementation of the program, and consult with employees to ensure proper use.

(m) Recordkeeping

- Records of medical evaluations must be retained and made available per 29 CFR 1910.1020.
- A record of fit tests must be established and retained until the next fit test.
- A written copy of the current program must be retained.