

Side-by-Side for Proposed Regulatory Text Changes in the Chemical-Specific Standards

This chart provides a side-by-side comparison of the proposed regulatory text amendments in the chemical-specific standards (on the left) and the provisions in the Respiratory Protection standard (29 CFR 1910.134) and/or the chemical-specific standards that OSHA believes provide equivalent worker protection (on the right). The list of provisions in the right-hand column is not exhaustive and there are other aspects of all of the standards that involve respirator use, but OSHA has included the provisions that are most directly related to the changes it is proposing.

Proposed additions to the text are in **bold** and proposed deletions of text are in ~~strike through~~. Non-substantive changes (e.g., changes in numbering/lettering, corrections to section numbers) are not included.

Proposed Change to Chemical-Specific Standard	Language Elsewhere in Chemical-Specific Standard or in 1910.134 That Provides Equivalent Protection
Formaldehyde (revisions to 29 CFR 1910.1048 would also modify 29 CFR 1926.1148)	
1910.1048(g) <i>Respiratory protection –</i> 1910.1048(g)(1) <i>General.</i> For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used during : when the employer determines that they are necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2). 1910.1048(g)(1)(i) Periods necessary to install or implement feasible engineering and work-practice controls. 1910.1048(g)(1)(ii) Work operations, such as maintenance and repair activities or vessel cleaning, for which the employer establishes that engineering and work-practice controls are not feasible. 1910.1048(g)(1)(iii) Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the PELs.	<u>Respiratory Protection standard</u> 1910.134(a)(2) A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended... 1910.134(d)(3)(i) The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. <u>Formaldehyde standard</u> 1910.1048(c)(1) TWA: The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds 0.75 parts formaldehyde per million parts of air (0.75 ppm) as an 8-hour TWA. 1910.1048(c)(2)

1910.1048(g)(1)(iv) Emergencies.	<i>Short Term Exposure Limit (STEL):</i> The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds two parts formaldehyde per million parts of air (2 ppm) as a 15-minute STEL. 1910.1048(f)(2) <i>Exception.</i> Whenever the employer has established that feasible engineering and work practice controls cannot reduce employee exposure to or below either of the PELs, the employer shall apply these controls to reduce employee exposures to the extent feasible and shall supplement them with respirators which satisfy this standard.
--	--

Methylene Chloride

(revisions to 29 CFR 1910.1052 would also modify 29 CFR 1926.1152)

1910.1052(g)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used ~~during~~ **when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1910.1052(g)(1)(i)-~~

~~Periods when an employee's exposure to MC exceeds the 8-hour TWA PEL, or STEL (for example, when an employee is using MC in a regulated area)-~~

~~1910.1052(g)(1)(ii)-~~

~~Periods necessary to install or implement feasible engineering and work-practice controls-~~

~~1910.1052(g)(1)(iii)-~~

~~A few work operations, such as some maintenance operations and repair activities, for which the employer demonstrates that engineering and work-practice controls are infeasible-~~

~~1910.1052(g)(1)(iv)-~~

~~Work operations for which feasible engineering and work-practice controls are not sufficient to reduce employee exposures to or below the PELs-~~

~~1910.1052(g)(1)(v)-~~

~~Emergencies-~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

Methylene Chloride standard

1910.1052(e)(3)

The employer shall supply a respirator, selected in accordance with paragraph (h)(3) of this section, to each person who enters a regulated area and shall require each affected employee to use that respirator whenever MC exposures are likely to exceed the 8-hour TWA PEL or STEL. Note to paragraph (e)(3): An employer who has implemented all feasible engineering, work practice and administrative controls (as required in paragraph (f) of this section), and who has established a regulated area (as required by paragraph (e)(1) of this section) where MC exposure can be reliably predicted to exceed the 8-hour TWA PEL or the STEL only on certain days (for example, because of work or process schedule) would need to have affected employees use respirators in that regulated area only on those days.

1910.1052(f)(1)

Engineering and work practice controls. The employer shall institute and maintain the effectiveness of engineering controls and work practices to reduce employee exposure to or below the PELs except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or

	below the 8-TWA PEL or STEL, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of paragraph (g) of this section.
1910.1052(g)(3) <i>Respirator selection.</i> Employers must: 1910.1052(g)(3)(i) Select, and provide to employees, the appropriate atmosphere-supplying respirator specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers must not select or use half masks of any type because MC may cause eye irritation or damage.	<u>Methylene Chloride standard</u> 1910.1052(h) <i>Protective Work Clothing and Equipment.</i> 1910.1052(h)(1) Where needed to prevent MC-induced skin or eye irritation, the employer shall provide clean protective clothing and equipment which is resistant to MC, at no cost to the employee, and shall ensure that each affected employee uses it. Eye and face protection shall meet the requirements of 29 CFR 1910.133 or 29 CFR 1915.153, as applicable.
1910.1052(g)(4) <i>Medical evaluation.</i> Before having an employee use a supplied-air respirator in the negative-pressure mode, or a gas mask with an organic-vapor canister for emergency escape, the employer must: 1910.1052(g)(4)(i) Have a physician or other licensed health-care professional (PLHCP) evaluate the employee's ability to use such respiratory protection. 1910.1052(g)(4)(ii) Ensure that the PLHCP provides their findings in a written opinion to the employee and the employer.	<u>Methylene Chloride standard</u> 1910.1052(g)(2) <i>Respirator program.</i> 1910.1052(g)(2)(i) The employer must implement a respiratory protection program in accordance with § 1910.134(b) through (m) (except (d)(1)(iii)), which covers each employee required by this section to use a respirator. <u>Respiratory Protection standard</u> 1910.134(e) <i>Medical evaluation.</i> Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator. 1910.134(e)(1) <i>General.</i> The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer

	may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator. 1910.134(e)(2) <i>Medical evaluation procedures.</i> *** 1910.134(e)(3) <i>Follow-up medical examination.</i> *** 1910.134(e)(4) <i>Administration of the medical questionnaire and examinations.</i> *** 1910.134(e)(5) <i>Supplemental information for the PLHCP.</i> *** 1910.134(e)(6) <i>Medical determination.</i> *** 1910.134(e)(7) <i>Additional medical evaluations.</i>
--	---

Methylenedianiline

(29 CFR 1926.60)

1926.60(i)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used ~~during~~ **when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1926.60(i)(1)(i)~~

~~Periods necessary to install or implement feasible engineering and work-practice controls.~~

~~1926.60(i)(1)(ii)~~

~~Work operations, such as maintenance and repair activities and spray-application processes, for which engineering and work-practice controls are not feasible.~~

~~1926.60(i)(1)(iii)~~

~~Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the PELs.~~

~~1926.60(i)(1)(iv)~~

~~Emergencies.~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

Methylenedianiline standard

1926.60(c)

Permissible exposure limits. The employer shall assure that no employee is exposed to an airborne concentration of MDA in excess of ten parts per billion (10 ppb) as an 8-hour time-weighted average and a STEL of one hundred parts per billion (100 ppb).

1926.60(e)(1)(ii)

The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with the appropriate personal protective equipment and clothing as required in paragraphs (i) and (j) of this section until the emergency is abated.

1926.60(g)(4)

Personal protective equipment and clothing. Each person entering a regulated area shall be supplied with, and required to use, the appropriate personal protective clothing and equipment in accordance with paragraphs (i) and (j) of this section.

926.60(h)(1)(ii)

Wherever the feasible engineering controls and work practices "which can be instituted are not sufficient to reduce employee exposure to or

	below the PELs, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protective devices which comply with the requirements of paragraph (i) of this section. 1926.60(h)(2) <i>Special Provisions.</i> For workers engaged in spray application methods, respiratory protection must be used in addition to feasible engineering controls and work practices to reduce employee exposure to or below the PELs.
1926.60(i)(3)(i)(B) Provide HEPA filters for powered and non-powered air-purifying respirators.	<u>Respiratory Protection standard</u> 1910.134(a)(2) ... The employer shall provide the respirators which are applicable and suitable for the purpose intended. 1910.134(d) <i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors... *** 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. 1910.134(d)(3)(iv) For protection against particulates, the employer shall provide: *** 1910.134(d)(3)(iv)(B) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or 1910.134(d)(3)(iv)(C)

	For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.
Benzene (revisions to 29 CFR 1910.1028 would also modify 29 CFR 1926.1128)	
1910.1028(g) <i>Respiratory protection -</i> 1910.1028(g)(1) <i>General.</i> For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used during when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2). 1910.1028(g)(1)(i) (i) Periods necessary to install or implement feasible engineering and work-practice controls. 1910.1028(g)(1)(ii) Work operations for which the employer establishes that compliance with either the TWA or STEL through the use of engineering and work-practice controls is not feasible; for example, some maintenance and repair activities, vessel cleaning, or other operations for which engineering and work-practice controls are infeasible because exposures are intermittent and limited in duration. 1910.1028(g)(1)(iii) Work operations for which feasible engineering and work-practice controls are not yet sufficient, or are not required under paragraph (f)(1)(iii) of this section, to reduce employee exposure to or below the PELs. 1910.1028(g)(1)(iv) Emergencies.	<u>Respiratory Protection standard</u> 1910.134(a)(2) A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended... 1910.134(d)(3)(i) The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. <u>Benzene standard</u> 1910.1028(c)(1) <i>Time-weighted average limit (TWA).</i> The employer shall assure that no employee is exposed to an airborne concentration of benzene in excess of one part of benzene per million parts of air (1 ppm) as an 8-hour time-weighted average. 1910.1028(c)(2) <i>Short-term exposure limit (STEL).</i> The employer shall assure that no employee is exposed to an airborne concentration of benzene in excess of five (5) ppm as averaged over any 15 minute period. 1910.1028(f)(1)(ii) Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or below the PELs, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall

	supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section. 1910.1028(f)(1)(iii) Where the employer can document that benzene is used in a workplace less than a total of 30 days per year, the employer shall use engineering controls, work practice controls or respiratory protection or any combination of these controls to reduce employee exposure to benzene to or below the PELs, except that employers shall use engineering and work practice controls, if feasible, to reduce exposure to or below 10 ppm as an 8-hour TWA.
1910.1028(g)(3) <i>Respirator selection.</i> 1910.1028(g)(3)(i) Employers must: 1910.1028(g)(3)(i)(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134. *** 1910.1028(g)(3)(i)(C) Use an organic vapor cartridge or canister with powered and non-powered air-purifying respirators, and a chin-style canister with full facepiece gas masks.	<u>Respiratory Protection standard</u> 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. 1910.134(d)(3)(iii) For protection against gases and vapors, the employer shall provide: 1910.134(d)(3)(iii)(A) An atmosphere-supplying respirator, or 1910.134(d)(3)(iii)(B) An air-purifying respirator, provided that: 1910.134(d)(3)(iii)(B)(1) The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or 1910.134(d)(3)(iii)(B)(2) If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

Ethylene Oxide

(revisions to 29 CFR 1910.1047 would also modify 29 CFR 1926.1147)

1910.1047(g)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used ~~during~~ **when the employer determines that they are necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1910.1047(g)(1)(i)~~

~~Periods necessary to install or implement feasible engineering and work-practice controls.~~

~~1910.1047(g)(1)(ii)~~

~~Work operations, such as maintenance and repair activities and vessel cleaning, for which engineering and work-practice controls are not feasible.~~

~~1910.1047(g)(1)(iii)~~

~~Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the TWA.~~

~~1910.1047(g)(1)(iv)~~

~~Emergencies.~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

Ethylene Oxide standard

1910.1047(c)(1)

8-hour time weighted average (TWA). The employer shall ensure that no employee is exposed to an airborne concentration of EtO in excess of one (1) part EtO per million parts of air (1 ppm) as an 8-hour time-weighted average (8-hour TWA).

1910.1047(c)(2)

Excursion limit. The employer shall ensure that no employee is exposed to an airborne concentration of EtO in excess of 5 parts of EtO per million parts of air (5 ppm) as averaged over a sampling period of fifteen (15) minutes.

1910.1047(f)(1)(ii)

Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure to or below the TWA and to or below the excursion limit, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of paragraph (g) of this section.

1910.1047(f)(1)(iii)

	Engineering controls are generally infeasible for the following operations: collection of quality assurance sampling from sterilized materials; removal of biological indicators from sterilized materials; loading and unloading of tank cars; changing of ethylene oxide tanks on sterilizers; and vessel cleaning. For these operations, engineering controls are required only where the Assistant Secretary demonstrates that such controls are feasible.
1910.1047(g)(3) <i>Respirator selection.</i> Employers must: 1910.1047(g)(3)(i) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers must not select or use half masks of any type because EtO may cause eye irritation or injury.	<u>Ethylene Oxide standard</u> 1910.1047(g)(4) <i>Protective clothing and equipment.</i> When employees could have eye or skin contact with EtO or EtO solutions, the employer must select and provide, at no cost to the employee, appropriate protective clothing or other equipment in accordance with 29 CFR 1910.132 and 1910.133 to protect any area of the employee's body that may come in contact with the EtO or EtO solution, and must ensure that the employee wears the protective clothing and equipment provided.
1910.1047(g)(3)(ii) Equip each air-purifying, full facepiece respirator with a front or back-mounted canister approved for protection against ethylene oxide.	<u>Respiratory Protection standard</u> 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. 1910.134(d)(3)(iii) For protection against gases and vapors, the employer shall provide: 1910.134(d)(3)(iii)(A) An atmosphere-supplying respirator, or 1910.134(d)(3)(iii)(B) An air-purifying respirator, provided that: 1910.134(d)(3)(iii)(B)(1) The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or 1910.134(d)(3)(iii)(B)(2) If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges

	that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.
--	--

13 Carcinogens

(revisions to 29 CFR 1910.1003 would also modify 29 CFR 1926.1103)

1910.1003(c)(4)(iv)

Employers must provide each employee engaged in handling operations involving the carcinogens 4-Nitrobiphenyl, alpha-Naphthylamine, 3,3'-Dichlorobenzidine (and its salts), beta-Naphthylamine, Benzidine, 4-Aminodiphenyl, 2-Acetylaminofluorene, 4-Dimethylaminoazo-benzene, and N-Nitrosodimethylamine, addressed by this section, with, and ensure that each of these employees wears and uses, a NIOSH-certified ~~air-purifying, half-mask respirator for particulates filters that has an assigned protection factor (APF) of 10.~~ Employers also must provide each employee engaged in handling operations involving the carcinogens methyl chloromethyl ether, bis-Chloromethyl ether, Ethyleneimine, and beta-Propiolactone, addressed by this section, with, and ensure that each of these employees wears and uses ~~any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus~~ **a respirator that has an APF of 10,000.** Employers may substitute a respirator affording employees higher levels of protection than these respirators.

Respiratory Protection standard

1910.134(d)(3)(i)(A)

Assigned Protection Factors (APFs). Employers must use the assigned protection factors 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.

Table 1 - Assigned Protection Factors⁵

Type of respirator ^{1 2}	Quarter mask	Half mask	Full facepiece	Helmet/hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	³ 10	50		
2. Powered Air-Purifying Respirator (PAPR)		50	1,000	⁴ 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode		10	50		
• Continuous flow mode		50	1,000	⁴ 25/1,000	25
• Pressure-demand or other positive-pressure mode		50	1,000		
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode		10	50	50	
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000	

Notes:

¹Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

²The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing,

	maintenance, and use requirements. ³This APF category includes filtering facepieces, and half masks with elastomeric facepieces. ⁴The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25. ⁵These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).
--	--

1,3-Butadiene

(revisions to 29 CFR 1910.1051 would also modify 29 CFR 1926.55)

1910.1051(h)

Respiratory protection -

1910.1051(h)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used ~~during~~ **when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1910.1051(h)(1)(i)~~

~~Periods necessary to install or implement feasible engineering and work-practice controls.~~

~~1910.1051(h)(1)(ii)~~

~~Non-routine work operations that are performed infrequently and for which employee exposures are limited in duration.~~

~~1910.1051(h)(1)(iii)~~

~~Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposures to or below the PELs.~~

~~1910.1051(h)(1)(iv)~~

~~Emergencies.~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

1,3-Butadiene standard

1910.1051(c)(1)

Time-weighted average (TWA) limit. The employer shall ensure that no employee is exposed to an airborne concentration of BD in excess of one (1) part BD per million parts of air (ppm) measured as an eight (8)-hour time-weighted average.

1910.1051(c)(2)

Short-term exposure limit (STEL). The employer shall ensure that no employee is exposed to an airborne concentration of BD in excess of five parts of BD per million parts of air (5 ppm) as determined over a sampling period of fifteen (15) minutes.

1910.1051(f)(1)(ii)

Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or below the 8-hour TWA or STEL, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of paragraph (h) of this section.

1910.1051(h)(3)

Respirator selection.

Respiratory Protection standard

1910.134(d)(3)(i)(A)

1910.1051(h)(3)(i)

The employer must select appropriate respirators from Table 1 of this section, and provide to employees the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

Table 1 - Minimum Requirements for Respiratory Protection for Airborne BD

Concentration of airborne BD (ppm) or condition of use	Minimum required respirator
Less than or equal to 5 ppm (5 times PEL)	(a) Air-purifying half mask or full facepiece A respirator with a minimum assigned protection factor (APF) of 10, equipped with approved BD or organic vapor cartridges or canisters. Cartridges or canisters shall be replaced every 4 hours.
Less than or equal to 10 ppm (10 times PEL)	(a) Air-purifying half mask or full facepiece A respirator with a minimum APF of 10, equipped with approved BD or organic vapor cartridges or canisters. Cartridges or canisters shall be replaced every 3 hours.
Less than or equal to 25 ppm (25 times PEL)	(a) Air-purifying full facepiece A respirator with a minimum APF of 25, equipped with approved BD or organic vapor cartridges or canisters. Cartridges or canisters shall be replaced every 2 hours. (b) Any powered air-purifying respirator equipped with approved BD or organic vapor cartridges. PAPR cartridges shall be replaced every 2 hours. (c) Continuous flow supplied air respirator equipped with a hood or helmet.
Less than or equal to 50 ppm (50 times PEL)	(a) Air-purifying full facepiece A respirator with a minimum APF of 50, equipped with approved BD or organic vapor cartridges or canisters. Cartridges or canisters shall be replaced every (1) hour. (b) Powered air-purifying respirator equipped with a tight-fitting facepiece and an approved BD or organic vapor cartridges. PAPR cartridges shall be replaced every (1) hour.
Less than or equal to 1,000 ppm (1,000 times PEL)	(a) Supplied air respirator equipped with a half mask or full facepiece and operated in a pressure demand or other positive pressure mode.
Greater than 1,000 ppm unknown concentration, or firefighting	(a) Self-contained breathing apparatus equipped with a full facepiece and operated in a pressure demand or other positive pressure mode. (b) Any supplied air respirator equipped with a full facepiece and operated in a pressure demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in a pressure demand or other positive pressure mode.
Escape from IDLH conditions	(a) Any positive pressure self-contained breathing apparatus with an appropriate service life. (b) A air-purifying full facepiece respirator equipped with a front or back mounted BD or organic vapor canister.

Assigned Protection Factors (APFs); Employers must use the assigned protection factors 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.

Table 1 - Assigned Protection Factors⁵

Type of respirator ^{1 2}	Quarter mask	Half mask	Full facepiece	Helmet/hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	³ 10	50		
2. Powered Air-Purifying Respirator (PAPR)		50	1,000	⁴ 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode		10	50		
• Continuous flow mode		50	1,000	⁴ 25/1,000	25
• Pressure-demand or other positive-pressure mode		50	1,000		
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode		10	50	50	
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000	

Notes:

¹Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

²The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

³This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

⁴The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This

	level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25. ⁵These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).
1910.1051(h)(3)(i) The employer must select appropriate respirators from Table 1 of this section Table 1 – Minimum Requirements for Respiratory Protection for Airborne BD *** NOTES: Respirators approved for use in higher concentrations are permitted to be used in lower concentrations. Full facepiece is required when eye irritation is anticipated.	<u>1,3-Butadiene standard</u> 1910.1051(i) <i>Protective clothing and equipment.</i> Where appropriate to prevent eye contact and limit dermal exposure to BD, the employer shall provide protective clothing and equipment at no cost to the employee and shall ensure its use. Eye and face protection shall meet the requirements of 29 CFR 1910.133.

Inorganic Arsenic

(revisions to 29 CFR 1910.1018 would also modify 29 CFR 1926.1118)

1910.1018(h) Respiratory protection- 1910.1018(h)(1) General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2) and during: 1910.1018(h)(1)(i) Periods necessary to install or implement feasible engineering or work-practice controls. 1910.1018(h)(1)(ii) Work operations, such as maintenance and repair activities, for which the employer establishes that engineering and work-practice controls are not feasible. 1910.1018(h)(1)(iii) Work operations for which engineering and work-practice controls are not yet sufficient to reduce employee exposures to or below the permissible exposure limit. 1910.1018(h)(1)(iv) Emergencies.	<u>Respiratory Protection standard</u> 1910.134(a)(2) A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended... 1910.134(d)(3)(i) The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. <u>Inorganic Arsenic standard</u> 1910.1018(c) <i>Permissible exposure limit.</i> The employer shall assure that no employee is exposed to inorganic arsenic at concentrations greater than 10 micrograms per cubic meter of air (10 µg/m³), averaged over any 8-hour period. 1910.1018(g)(1)(ii) Where engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these controls and shall be supplemented by the use of respirators in accordance with paragraph (h) of this section and other necessary personal protective equipment. Employee rotation is not required as a control strategy before respiratory protection is instituted.
1910.1018(h)(3)(i)(C) Provide HEPA filters for powered and non-powered air-purifying respirators.	<u>Respiratory Protection standard</u> 1910.134(a)(2) ... The employer shall provide the respirators which are applicable and suitable for the purpose intended. 1910.134(d) <i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant

	workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. *** 1910.134(d)(3)(iv) For protection against particulates, the employer shall provide: *** 1910.134(d)(3)(iv)(B) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or 1910.134(d)(3)(iv)(C) For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.
1910.1018(h)(3)(i)(D)- Select for employee use:- 1910.1018(h)(3)(i)(D)(1)- Air-purifying respirators that have a combination HEPA filter with an appropriate gas-sorbent cartridge or canister when the employee's exposure exceeds the permissible exposure level for inorganic arsenic and the relevant limit for other gases.- 1910.1018(h)(3)(i)(D)(2)-	<u>Respiratory Protection standard</u> 1910.134(d) <i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators. ***

Front or back-mounted gas masks equipped with HEPA filters and acid gas canisters or any full facepiece supplied-air respirators when the inorganic arsenic concentration is at or below 500 mg/m³; and half mask air-purifying respirators equipped with HEPA filters and acid gas cartridges when the inorganic arsenic concentration is at or below 100 µg/m³. 1910.1018(h)(3)(ii) Employees required to use respirators may choose, and the employer must provide, a powered air-purifying respirator if it will provide proper protection. In addition, the employer must provide a combination dust and acid-gas respirator to employees who are exposed to gases over the relevant exposure limits.	1910.134(d)(1)(i)The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability. 1910.134(d)(1)(ii) The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification. *** 1910.134(d)(3)(iii) For protection against gases and vapors, the employer shall provide: 1910.134(d)(3)(iii)(A) An atmosphere-supplying respirator, or 1910.134(d)(3)(iii)(B) An air-purifying respirator, provided that: 1910.134(d)(3)(iii)(B)(1) The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or 1910.134(d)(3)(iii)(B)(2) If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.
1910.1018(o)(1) <i>Training program.</i> *** 1910.1018(o)(1)(ii)	<u>Respiratory Protection standard</u> 1910.134(k) <i>Training and information.</i> This paragraph requires the employer to provide effective training to employees who are required to use respirators. The

The training program shall be provided by October 1, 1978, for employees covered by this provision, at the time of initial assignment for those subsequently covered by this provision, and at least annually for other covered employees thereafter; and the employer shall assure that each employee is informed of the following: 1910.1018(o)(1)(ii)(A) The information contained in Appendix A; 1910.1018(o)(1)(ii)(B) The quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations which could result in exposure to inorganic arsenic as well as any necessary protective steps; 1910.1018(o)(1)(ii)(C) The purpose, proper use, and limitation of respirators; 1910.1018(o)(1)(ii)(D) The purpose and a description of the medical surveillance program as required by paragraph (n) of this section; 1910.1018(o)(1)(ii)(E) The engineering controls and work practices associated with the employee's job assignment; and 1910.1018(o)(1)(ii)(F) A review of this standard.	training must be comprehensive, understandable, and recur annually, and more often if necessary... 1910.134(k)(1) The employer shall ensure that each employee can demonstrate knowledge of at least the following: 1910.134(k)(1)(i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator; 1910.134(k)(1)(ii) What the limitations and capabilities of the respirator are; 1910.134(k)(1)(iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions; 1910.134(k)(1)(iv) How to inspect, put on and remove, use, and check the seals of the respirator; 1910.134(k)(1)(v) What the procedures are for maintenance and storage of the respirator; 1910.134(k)(1)(vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and 1910.134(k)(1)(vii) The general requirements of this section.
---	--

Cadmium

(29 CFR 1926.1127)

1926.1127(g)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used **during when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1926.1127(g)(1)(i)-~~

~~Periods necessary to install or implement feasible engineering and work-practice controls when employee exposures exceed the PEL.~~

~~1926.1127(g)(1)(ii)-~~

~~Maintenance and repair activities, and brief or intermittent work operations, for which employee exposures exceed the PEL and engineering and work-practice controls are not feasible or are not required.~~

~~1926.1127(g)(1)(iii)-~~

~~Work operations in the regulated areas specified in paragraph (e) of this section.~~

~~1926.1127(g)(1)(iv)-~~

~~Work operations for which the employer has implemented all feasible engineering and work-practice controls, and such controls are not sufficient to reduce employee exposures to or below the PEL.~~

~~1926.1127(g)(1)(v)-~~

~~Work operations for which an employee, who is exposed to cadmium at or above the action level, requests a respirator.~~

~~1926.1127(g)(1)(vi)-~~

~~Work operations for which engineering controls are not required by paragraph (f)(1)(ii) of this section to reduce employee exposures that exceed the PEL.~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(c)(2)(i)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

Cadmium standard

1926.1127(c)

Permissible Exposure Limit (PEL). The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per cubic meter of air ($5 \mu\text{g}/\text{m}^3$), calculated as an eight-hour time-weighted average exposure (TWA).

1926.1127(e)(4)

Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with paragraph (g)(2) of this section.

1926.1127(f)(5)(i)

Where employee exposure to cadmium exceeds the PEL and the employer is required under paragraph (f)(1) of this section to implement controls to comply with the PEL, prior to the commencement of the job the employer shall establish and implement a written compliance program to reduce

1926.1127(g)(1)(vii) Emergencies.	employee exposure to or below the PEL. To the extent that engineering and work practice controls cannot reduce exposures to or below the PEL, the employer shall include in the written compliance program the use of appropriate respiratory protection to achieve compliance with the PEL. 1926.1127(h) <i>Emergency situations.</i> The employer shall develop and implement a written plan for dealing with emergency situations involving substantial releases of airborne cadmium. The plan shall include provisions for the use of appropriate respirators and personal protective equipment. In addition, employees not essential to correcting the emergency situation shall be restricted from the area and normal operations halted in that area until the emergency is abated.
1926.1127(g)(3) <i>Respirator selection.</i> 1926.1127(g)(3)(i) Employers must 1926.1127(g)(3)(i)(A) select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134. 1926.1127(g)(3)(i)(B) Provide employees with full facepiece respirators when they experience eye irritation.	<u>Cadmium standard</u> 1926.1127(i)(1) <i>Provision and use.</i> If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments. Protective work clothing and equipment includes, but is not limited to: *** 1926.1127(i)(1)(iii) Face shields, vented goggles, or other appropriate protective equipment that complies with 29 CFR 1910.133.
1926.1127(g)(3)(i)(C) Provide HEPA filters for powered and non-powered air-purifying respirators.	<u>Respiratory Protection standard</u> 1910.134(a)(2) ... The employer shall provide the respirators which are applicable and suitable for the purpose intended. 1910.134(d)

	<i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors... *** 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. *** 1910.134(d)(3)(iv) For protection against particulates, the employer shall provide: *** 1910.134(d)(3)(iv)(B) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or 1910.134(d)(3)(iv)(C) For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.
1926.1127(m)(4) <i>Employee information and training.</i> *** 1926.1127(m)(4)(iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following: 1926.1127(m)(4)(iii)(A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in appendix A to this section;	<u>Respiratory Protection standard</u> 1910.134(k) <i>Training and information.</i> This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary... 1910.134(k)(1) The employer shall ensure that each employee can demonstrate knowledge of at least the following: 1910.134(k)(1)(i)

1926.1127(m)(4)(iii)(B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL; 1926.1127(m)(4)(iii)(C) The engineering controls and work practices associated with the employee's job assignment; 1926.1127(m)(4)(iii)(D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment; 1926.1127(m)(4)(iii)(E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing; 1926.1127(m)(4)(iii)(F) The purpose and a description of the medical surveillance program required by paragraph (l) of this section; 1926.1127(m)(4)(iii)(G) The contents of this section and its appendices, and, 1926.1127(m)(4)(iii)(H) The employee's rights of access to records under §1926.33(g) (1) and (2).	Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator; 1910.134(k)(1)(ii) What the limitations and capabilities of the respirator are; 1910.134(k)(1)(iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions; 1910.134(k)(1)(iv) How to inspect, put on and remove, use, and check the seals of the respirator; 1910.134(k)(1)(v) What the procedures are for maintenance and storage of the respirator; 1910.134(k)(1)(vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and 1910.134(k)(1)(vii) The general requirements of this section.
---	--

Lead

(29 CFR 1926.62)

1926.62(f)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used **during when the employer determines that it is necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2) and during periods when an employee requests a respirator.**

~~1926.62(f)(1)(i)~~

~~Periods when an employee's exposure to lead exceeds the PEL.~~

~~1926.62(f)(1)(ii)~~

~~Work operations for which engineering and work-practice controls are not sufficient to reduce employee exposures to or below the PEL.~~

~~1926.62(f)(1)(iii)~~

~~Periods when an employee requests a respirator~~

~~1926.62(f)(1)(iv)~~

~~Periods when respirators are required to provide interim protection of employees while they perform the operations specified in paragraph (d)(2) of this section.~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

Lead standard

1926.62(c)(1)

The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 µg/m³) averaged over an 8-hour period.

1926.62(c)(3)

When respirators are used to limit employee exposure as required under paragraph (c) of this section and all the requirements of paragraphs (e)(1) and (f) of this section have been met, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

1926.62(d)(2)(i)

With respect to the lead related tasks listed in paragraph (d)(2)(i) of this section, where lead is present, until the employer performs an employee exposure assessment as required in paragraph (d) of this section and documents that the employee performing any of the listed tasks is not exposed above the PEL, the employer shall treat the employee as if the employee were exposed above the PEL, and not in excess of ten (10) times the PEL, and shall implement employee protective measures prescribed in paragraph (d)(2)(v) of this section. The tasks covered by this requirement are:...

	*** 1926.62(d)(2)(v) Until the employer performs an employee exposure assessment as required under paragraph (d) of this section and determines actual employee exposure, the employer shall provide to employees performing the tasks described in paragraphs (d)(2)(i), (d)(2)(ii), (d)(2)(iii) and (d)(2)(iv) of this section with interim protection as follows:... 1926.62(d)(2)(v)(A) Appropriate respiratory protection in accordance with paragraph (f) of this section.
1926.62(f)(3)(i) Employers must select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)A of 29 CFR 1910.134. 1926.62(f)(3)(i)(A) Select and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134. 1926.62(f)(3)(i)(B) Provide employees with a full facepiece respirator instead of a half mask respirator for protection against lead aerosols that may cause eye or skin irritation at the use concentrations.	<u>Lead standard</u> 1926.62(g)(1) <i>Provision and use.</i> Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (e.g. lead arsenate, lead azide), and as interim protection for employees performing tasks as specified in paragraph (d)(2) of this section, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments such as, but not limited to: *** 1926.62(g)(1)(iii) Face shields, vented goggles, or other appropriate protective equipment which complies with § 1910.133 of this chapter.
1926.62(f)(3)(i)(C) Provide HEPA filters for powered and non-powered air-purifying respirators.	<u>Respiratory Protection standard</u> 1910.134(a)(2) ... The employer shall provide the respirators which are applicable and suitable for the purpose intended. 1910.134(d)

	<i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors... *** 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. *** 1910.134(d)(3)(iv) For protection against particulates, the employer shall provide: *** 1910.134(d)(3)(iv)(B) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or 1910.134(d)(3)(iv)(C) For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.
1926.62(l)(2) <i>Training program.</i> The employer shall assure that each employee is trained in the following: 1926.62(l)(2)(i) The content of this standard and its appendices; 1926.62(l)(2)(ii) The specific nature of the operations which could result in exposure to lead above the action level;	<u>Respiratory Protection standard</u> 1910.134(k) <i>Training and information.</i> This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary... 1910.134(k)(1) The employer shall ensure that each employee can demonstrate knowledge of at least the following:

1926.62(l)(2)(iii) The purpose, proper selection, fitting, use, and limitations of respirators; 1926.62(l)(2)(iv) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant); 1926.62(l)(2)(v) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in appendix B of this section; 1926.62(l)(2)(vi) The contents of any compliance plan in effect; 1926.62(l)(2)(vii) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and 1926.62(l)(2)(viii) The employee's right of access to records under 29 CFR 1910.20.	1910.134(k)(1)(i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator; 1910.134(k)(1)(ii) What the limitations and capabilities of the respirator are; 1910.134(k)(1)(iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions; 1910.134(k)(1)(iv) How to inspect, put on and remove, use, and check the seals of the respirator; 1910.134(k)(1)(v) What the procedures are for maintenance and storage of the respirator; 1910.134(k)(1)(vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and 1910.134(k)(1)(vii) The general requirements of this section.
---	---

Asbestos

(29 CFR 1926.1101)

1926.1101(h)(1)

General. For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used ~~during~~ **when the employer determines that they are necessary to protect the health of an employee as required under 29 CFR 1910.134(a)(2).**

~~1926.1101(h)(1)(i)~~

~~Class I asbestos work.~~

~~1926.1101(h)(1)(ii)~~

~~Class II asbestos work when ACM is not removed in a substantially intact state.~~

~~1926.1101(h)(1)(iii)~~

~~Class II and III asbestos work that is not performed using wet methods, except for removal of ACM from sloped roofs when a negative exposure assessment has been conducted and ACM is removed in an intact state.~~

~~1926.1101(h)(1)(iv)~~

~~Class II and III asbestos work for which a negative exposure assessment has not been conducted.~~

~~1926.1101(h)(v)~~

~~Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.~~

~~1926.1101(h)(1)(vi)~~

~~Class IV asbestos work performed within regulated areas where employees who are performing other work are required to use respirators.~~

~~1926.1101(h)(1)(vii)~~

Respiratory Protection standard

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended...

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

Asbestos standard

1926.1101(c)(1)

Time-weighted average limit (TWA). The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the method prescribed in appendix A to this section, or by an equivalent method.

1926.1101(c)(2)

Excursion limit. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by the method prescribed in appendix A to this section, or by an equivalent method.

1926.1101(e)(4)

Respirators. All persons entering a regulated area where employees are required pursuant to paragraph (h)(1) of this section to wear respirators shall be supplied with a respirator selected in accordance with paragraph (h)(3) of this section.

~~Work operations covered by this section for which employees are exposed above the TWA or excursion limit.~~

~~1926.1101(h)(1)(viii)-
Emergencies.~~

1926.1101(f)(2)(ii)

Basis of Initial Exposure Assessment: Unless a negative exposure assessment has been made pursuant to paragraph (f)(2)(iii) of this section, the initial exposure assessment shall, if feasible, be based on monitoring conducted pursuant to paragraph (f)(1)(iii) of this section. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the employer which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment pursuant to paragraph (f)(2)(iii) of this section, the employer shall presume that employees are exposed in excess of the TWA and excursion limit.

1926.1101(g)(2)(v)

Wherever the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the permissible exposure limit and/or excursion limit prescribed in paragraph (c) of this section, the employer shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of paragraph (h) of this section.

1926.1101(g)(9)(v)

Employees performing Class III jobs, which involve the disturbance of thermal system insulation or surfacing material, or where the employer does not produce a "negative exposure assessment" or where monitoring results show a PEL has been exceeded, shall wear respirators which are selected, used and fitted pursuant to provisions of paragraph (h) of this section.

1926.1101(g)(10)(i)

Employees cleaning up debris and waste in a regulated area where respirators are required shall wear respirators which are selected, used and fitted pursuant to provisions of paragraph (h) of this section.

	1926.1101(h)(3)(iii) Employers must provide employees with an air-purifying half mask respirator, other than a filtering facepiece respirator, whenever the employees perform: 1926.1101(h)(3)(iii)(A) Class II or Class III asbestos work for which no negative exposure assessment is available. 1926.1101(h)(3)(iii)(B) Class III asbestos work involving disturbance of TSI or surfacing ACM or PACM.
1926.1101(h)(3)(i) Employers must select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers must not select or use filtering facepiece respirators for use against asbestos fibers. 1926.1101(h)(3)(i)(B) Provide HEPA filters for powered and non-powered air-purifying respirators.	<u>Respiratory Protection standard</u> 1910.134(d) <i>Selection of respirators.</i> This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators. *** 1910.134(d)(3)(ii) The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. 1910.134(d)(3)(iv) For protection against particulates, the employer shall provide: *** 1910.134(d)(3)(iv)(B) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or 1910.134(d)(3)(iv)(C)

	For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.																																																												
1926.1101(h)(3)(ii) Employers must provide an employee with a tight-fitting, powered air-purifying respirator (PAPR) that has a minimum assigned protection factor (APF) of 50 instead of a negative pressure respirator selected according to paragraph (h)(3)(i)(A) of this standard when the employee chooses to use a PAPR and it provides adequate protection to the employee. 1926.1101(h)(3)(iii) Employers must provide employees with a an air-purifying half mask respirator that has a minimum assigned protection factor (APF) of 10, other than a filtering facepiece respirator, whenever the employees perform: 1926.1101(h)(3)(iv) Employers must provide employees with: 1926.1101(h)(3)(iv)(A) A tight-fitting powered air-purifying respirator that has a minimum APF of 50, or a full facepiece supplied-air respirator operated in either or pressure-demand mode and equipped with either HEPA egress cartridges or an auxiliary positive-pressure, self-contained breathing apparatus (SCBA) whenever the employees are in a regulated area performing Class I asbestos work for which a negative exposure assessment is not available and the exposure assessment indicates that the exposure level will be at or below 1 f/cc as an 8-hour time-weighted average (TWA). 1926.1101(h)(3)(iv)(B) A full facepiece supplied-air respirator that has a minimum APF of 1,000 operated in the pressure-demand mode and equipped with an auxiliary positive-pressure SCBA whenever the employees are in a regulated area performing Class I asbestos work for which a negative exposure	<u>Respiratory Protection standard</u> 1910.134(d)(3)(i)(A) <i>Assigned Protection Factors (APFs)</i>. Employers must use the assigned protection factors 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. Table 1 - Assigned Protection Factors⁵ <table><tr><th>Type of respirator^{1 2}</th><th>Quarter mask</th><th>Half mask</th><th>Full facepiece</th><th>Helmet/hood</th><th>Loose-fitting facepiece</th></tr><tr><td>1. Air-Purifying Respirator</td><td>5</td><td>³10</td><td>50</td><td></td><td></td></tr><tr><td>2. Powered Air-Purifying Respirator (PAPR)</td><td></td><td>50</td><td>1,000</td><td>⁴25/1,000</td><td>25</td></tr><tr><td>3. Supplied-Air Respirator (SAR) or Airline Respirator</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>• Demand mode</td><td></td><td>10</td><td>50</td><td></td><td></td></tr><tr><td>• Continuous flow mode</td><td></td><td>50</td><td>1,000</td><td>⁴25/1,000</td><td>25</td></tr><tr><td>• Pressure-demand or other positive-pressure mode</td><td></td><td>50</td><td>1,000</td><td></td><td></td></tr><tr><td>4. Self-Contained Breathing Apparatus (SCBA)</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>• Demand mode</td><td></td><td>10</td><td>50</td><td>50</td><td></td></tr><tr><td>• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)</td><td></td><td></td><td>10,000</td><td>10,000</td><td></td></tr></table> Notes: ¹Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.	Type of respirator ^{1 2}	Quarter mask	Half mask	Full facepiece	Helmet/hood	Loose-fitting facepiece	1. Air-Purifying Respirator	5	³ 10	50			2. Powered Air-Purifying Respirator (PAPR)		50	1,000	⁴ 25/1,000	25	3. Supplied-Air Respirator (SAR) or Airline Respirator						• Demand mode		10	50			• Continuous flow mode		50	1,000	⁴ 25/1,000	25	• Pressure-demand or other positive-pressure mode		50	1,000			4. Self-Contained Breathing Apparatus (SCBA)						• Demand mode		10	50	50		• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000	
Type of respirator ^{1 2}	Quarter mask	Half mask	Full facepiece	Helmet/hood	Loose-fitting facepiece																																																								
1. Air-Purifying Respirator	5	³ 10	50																																																										
2. Powered Air-Purifying Respirator (PAPR)		50	1,000	⁴ 25/1,000	25																																																								
3. Supplied-Air Respirator (SAR) or Airline Respirator																																																													
• Demand mode		10	50																																																										
• Continuous flow mode		50	1,000	⁴ 25/1,000	25																																																								
• Pressure-demand or other positive-pressure mode		50	1,000																																																										
4. Self-Contained Breathing Apparatus (SCBA)																																																													
• Demand mode		10	50	50																																																									
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000																																																									

assessment is not available and the exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA.	²The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements. ³This APF category includes filtering facepieces, and half masks with elastomeric facepieces. ⁴The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25. ⁵These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).
1926.1101(k)(9) <i>Employee Information and Training.</i> *** 1926.1101(k)(9)(viii) The training program shall be conducted in a manner that the employee is able to understand. In addition to the content required by provisions in paragraphs (k)(9)(iii) through (vi) of this section, the employer shall ensure that each such employee is informed of the following: 1926.1101(k)(9)(viii)(A) Methods of recognizing asbestos, including the requirement in paragraph (k)(1) of this section to presume that certain building materials contain asbestos; 1926.1101(k)(9)(viii)(B) The health effects associated with asbestos exposure;	<u>Respiratory Protection standard</u> 1910.134(k) <i>Training and information.</i> This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary... 1910.134(k)(1) The employer shall ensure that each employee can demonstrate knowledge of at least the following: 1910.134(k)(1)(i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator; 1910.134(k)(1)(ii) What the limitations and capabilities of the respirator are; 1910.134(k)(1)(iii)

1926.1101(k)(9)(viii)(C) The relationship between smoking and asbestos in producing lung cancer; 1926.1101(k)(9)(viii)(D) The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures; where Class III and IV work will be or is performed, the contents of EPA 20T-2003, "Managing Asbestos In-Place" July 1990 or its equivalent in content; 1926.1101(k)(9)(viii)(E) The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134; 1926.1101(k)(9)(viii)(F) The appropriate work practices for performing the asbestos job; 1926.1101(k)(9)(viii)(G) Medical surveillance program requirements; 1926.1101(k)(9)(viii)(H) The content of this standard including appendices; 1926.1101(k)(9)(viii)(I) The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation. The employer may distribute the list of such organizations contained in appendix J to this section, to comply with this requirement; and 1926.1101(k)(9)(viii)(J) The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.	How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions; 1910.134(k)(1)(iv) How to inspect, put on and remove, use, and check the seals of the respirator; 1910.134(k)(1)(v) What the procedures are for maintenance and storage of the respirator; 1910.134(k)(1)(vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and 1910.134(k)(1)(vii) The general requirements of this section.
--	--