

# Regulations Update

## OH&ESD

## #26 Assigned Protection Factors

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**Published: November, 2006**

### **OSHA Regulation: 29 CFR 1910.134**

On August 24, 2006, The Occupational Safety and Health Administration (OSHA) issued a final rule for assigned protection factors (APFs). The standard was published in the *Federal Register*, 71 Fed. Reg. 50122 and revises the Respiratory Protection Standard that is codified as 29 CFR 1910.134. The standard applies to general industry, construction, shipyard, longshoring and marine terminal workplaces. This final rule adds definitions and requirements for APFs and maximum use concentrations (MUCs). This revision also supersedes respirator selection provisions in some of the substance specific standards.

This summary of the final rule on assigned protection factors was prepared by 3M OH&ESD. It does not represent an official, legal nor complete interpretation of the standard. If specific questions arise, the standard itself should be reviewed and relied on, rather than this summary. A copy of the APF final rule can be viewed or copied from our website; [www.3M.com/occsafety](http://www.3M.com/occsafety) or from the OSHA website, [http://www.osha.gov/FedReg\\_osha\\_pdf/FED20060824.pdf](http://www.osha.gov/FedReg_osha_pdf/FED20060824.pdf).

### **Summary**

This final rule adds definitions and requirements for assigned protection factors and maximum use concentrations to 29 CFR 1910.134 that was originally adopted by OSHA in 1998. The new provisions require employers to select respirators for substances listed in 29 CFR 1910.1000 using these new APFs. These new APFs are also required to be used for respirator selection in many of the OSHA substance-specific standards.

### **Dates**

The final rule becomes effective November 22, 2006.

### **Definitions**

#### **[29 CFR 1910.134 (b)]**

The final standard includes definitions for assigned protection factor and maximum use concentration. The definitions are:

**Assigned protection factor (APF)** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section [meaning 29 CFR 1910.134].

**Maximum use concentration (MUC)** means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be

protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

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### Respiratory Protection Selection

The selection paragraph of the respiratory protection standard, 29 CFR 1910(d)(3)(i), is amended to state:

*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.

### *B. Maximum Use Concentration (MUC).*

1. The employer 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 MUC.
2. Employers must not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard [29 CFR 1910.134].
3. When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.

### Assigned Protection Factor Table

The following table of APFs is now included in the respiratory protection standard. Footnotes 2 and 4 to this table should be noted. This rule assigns an APF of 10 to all half facepiece style respirators including filtering facepiece respirators. For powered air purifying respirators (PAPRs) and supplied air respirators (SARs) with hoods and helmets the APF

is 25 unless the employer has evidence provided by the respirator manufacturer that testing of these respirators provides a level of protection of 1000 or greater. In this case the employer can then use an APF of 1000. While some of the data has been published in journals and the OSHA record for APFs, 3M OH&ESD is currently collating performance data on these products to make available to its customers by the November 22, 2006 effective date.

**Table 1 — Assigned Protection Factors<sup>5</sup>**

| Type of Respirator <sup>1,2</sup>   | Quarter Mask | Half Mask       | Full Facepiece | Helmet/Hood           | Loose-Fitting Facepiece |
|---|--------------|-----------------|----------------|-----------------------|-------------------------|
| 1. Air-Purifying Respirator   | 5            | 10 <sup>3</sup> | 50             | —                     | —                       |
| 2. Powered Air-Purifying Respirator (PAPR)                                    | —            | 50              | 1,000          | 25/1,000 <sup>4</sup> | 25                      |
| 3. Supplied-Air Respirator (SAR) or Airline Respirator                        |              |                 |                |                       |                         |
| • Demand mode   | —            | 10              | 50             | —                     | —                       |
| • Continuous flow mode  | —            | 50              | 1,000          | 25/1,000 <sup>4</sup> | 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:**

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

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The following 3M respiratory inlet coverings are **loose fitting facepieces** and respirators with these respiratory inlet coverings have an APF of 25: BE-1, BE-12, BE-17, Airstream, L-500 Series, and L-700 Series. The following respiratory inlet coverings are either a **hood** or a **helmet** and powered air purifying or supplied air respirators with these respiratory inlet coverings have an APF of 1000 when there is testing that demonstrates performance at a level of 1000: BE-10, H-Series, L-900 Series, and Whitecap II. If this testing does not exist the APF is 25. While some of the data has been published in journals and the OSHA record for APFs, 3M OH&ESD is currently collating performance data on these products to make available to its customers by the November 22, 2006 effective date. OSHA indicates that a WPF or SWPF study or equivalent testing is the best evidence. OSHA stated that, “[an] employer may use a respirator at an APF of 1000 only when they have appropriate test results...”

There is an APF entry for self-contained breathing apparatus (SCBAs) with hoods and helmets. This is not a typographical error. There are two SCBAs on the market that utilize tight fitting hoods so that they operate in either demand or pressure demand mode. They are required to be fit tested and should not be confused with the hoods and helmets listed with the PAPRs and SARs.

#### Substance Specific Standards

In addition, OSHA revised some of the respirator selection provisions of the substance specific standards. The substance specific standards are those standards that provide detailed protection provisions for a single substance. Examples include asbestos, lead and the recent hexavalent chromium standard. The hexavalent chromium standard was not changed by this final rule.

#### Selection of Respirators

According to OSHA, both the existing OSHA respiratory protection standard and the final APF provisions require employers to use APFs as part of the respirator selection process. This process includes:

- Obtaining information about the workplace exposure to an airborne contaminant;
- Identifying the exposure limit [i.e., the permissible exposure limit (PEL)] for the contaminant;
- Using this information to calculate the required level of protection (i.e., the protection factor needed [*3M note: also called the hazard ratio*]) and;
- Referring to the APF table to determine which respirator to select.

For example, if the workplace concentration is 30 ppm and the PEL is 5 ppm, the protection factor needed is 6 ( $30 \div 5$ ). The minimum APF one can choose from Table 1 and meet the requirement for the protection factor needed is 10. All of the respirators listed in Table 1, except for the “Quarter Mask,” meet this APF requirement. Other requirements for proper respirator selection exist such as ensuring that the respirators meeting the APF requirement can also remove the contaminant with an appropriate chemical cartridge or by supplying breathable air. The MUC for a respirator with an APF of 10 in this example is 50 ppm. Because 30 ppm is less than the MUC, a half mask with appropriate chemical cartridges is allowed.

A respirator MUC is calculated by multiplying its APF by the PEL:  $MUC = APF \times PEL$ . The respirator can be used up to this concentration as long as the MUC does not exceed the immediately dangerous to life or health (IDLH) level.

For example, a negative pressure full facepiece respirator with organic vapor cartridges is being used for protection against an organic vapor with a PEL equal to 10 ppm and an IDLH level equal to 400 ppm. The calculated MUC is 500 ppm, but its actual MUC is limited by the IDLH level of 400 ppm because this respirator can not be used above the IDLH level.

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### COMBINATION RESPIRATORS

This final rule also states, “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.” This is because APFs for combination respirators are not listed in Table 1. The designs of the combination respirator are listed.

An example of a combination respirator is a full facepiece SAR operated in the continuous flow mode with P100 particulate filters. This respirator can be used in the SAR mode as a continuous flow airline or in the negative pressure full face piece air-purifying mode. The APF for this SAR mode is 1000. The APF for the air-purifying mode is 50. The challenge is how you can tell if the respirator is selected properly. The exposure concentration is typically a TWA. For this example, assume the 8 hr time weighted average (TWA) PEL is 0.5 mg/m<sup>3</sup>. The APF for the combination respirator can be calculated using a time weighted calculation. Let us also assume that the SAR mode is used for 7 hrs. and the air purifying mode is used for 1 hr (perhaps entry into and exit from the work areas before hooking up to the air supply for breaks and lunch). The TWA APF is:

$$\frac{[(h_{mode1})(APF)_{mode1} + (h_{mode2})(APF)_{mode2}]}{h_{total}}$$

where *h* designates hours used during modes 1 and 2 and *h total* is total hours.

In this example it becomes:

$$\frac{[(7hrs \times 1000) + (1hr \times 50)]}{8hrs} \approx 880$$

So the MUC for this respirator and use conditions is:  
880 X 0.5 mg/m<sup>3</sup> = 440 mg/m<sup>3</sup>.

As long as the air concentration is less than 440 mg/m<sup>3</sup>, the respirator is properly selected.

### Substance Specific Standards

The following OSHA substance specific standards for general industry, maritime and construction workplaces were changed by this final rule. In these standards the existing respirator selection tables with APFs were removed. The wording to the standard was changed as reflected below. These changes refer the reader to the new APFs that will be listed in 29 CFR 1910.134. Where specific respirator recommendations were maintained, they are listed in the new text of these standards.

The asbestos, arsenic, lead, cadmium and methylene dianiline (MDA) standards still require either an N100, R100, or P100 air purifying respirator or HEPA filter for powered air purifying respirators. The cotton dust standard requires an N100, R100 or P100 particulate filter for concentrations greater than 10 times the PEL. In addition, filtering facepiece respirators are still not allowed under the asbestos standards. The acrylonitrile and

formaldehyde standards require that either a cartridge with and end-of-service-life indicator be used or a cartridge change schedule is established as required in 29 CFR 1910.134 (d)(3)(iii)(B)(1&2).

*Note: Only the paragraphs that changed are listed below. There are unaffected paragraphs in these standards with respirator requirements.*

### General Industry Substance Specific Standards

#### § 1910.1001 Asbestos.

(g) \* \* \*

(2) \* \* \*

(ii) Employers must provide an employee with a tight-fitting, powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to paragraph (g)(3) of this standard [29 CFR 1910.1001] when the employee chooses to use a PAPR and it provides adequate protection to the employee.

\* \* \*

(3) Respirator selection.  
Employers must:

- (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 filtering facepiece respirators for protection against asbestos fibers.
- (ii) Provide HEPA filters for powered and non-powered air-purifying respirators.

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#### § 1910.1017 Vinyl chloride.

(g) \* \* \*

(3) \* \* \*

(i) Employers must:

(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Provide an organic vapor cartridge that has a service life of at least one hour when using a chemical cartridge respirator at vinyl chloride concentrations up to 10 ppm.

(C) Select a canister that has a service life of at least four hours when using a powered air-purifying respirator having a hood, helmet, or full or half facepiece, or a gas mask with a front-or back-mounted canister, at vinyl chloride concentrations up to 25 ppm.

#### § 1910.1018 Inorganic arsenic.

(h) \* \* \*

(3) \* \* \*

(i) Employers must:

(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Ensure that employees do not use half mask respirators for protection against arsenic trichloride because it is absorbed rapidly through the skin.

(C) Provide HEPA filters for powered and non-powered air-purifying respirators.

(D) Select for employee use:

(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.

(2) 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 µg/m<sup>3</sup>; 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/m<sup>3</sup>.

#### § 1910.1025 Lead.

(f) \* \* \*

(3) \* \* \*

(i) Employers must:

(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Provide employees with full facepiece respirators instead of half mask respirators for protection against lead aerosols that cause eye or skin irritation at the use concentrations.

(C) Provide HEPA filters for powered and non-powered air-purifying respirators.

(ii) Employers must provide employees with a powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to paragraph (f)(3)(i) of this standard [29 CFR 1910.1025] when an employee chooses to use a PAPR and it provides adequate protection to the employee as specified by paragraph (f)(3)(i) of this standard [29 CFR 1910.1025].

#### § 1910.1027 Cadmium.

(g) \* \* \*

(3) \* \* \*

(i) Employers must:

(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Provide employees with full facepiece respirators when they experience eye irritation.

(C) Provide HEPA filters for powered and non-powered air-purifying respirators.

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#### § 1910.1028 Benzene.

- (g) \* \* \*
- (2) \* \* \*
- (i) Employers must implement a respiratory protection program in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m).
- (3) \* \* \*
- (i) Employers must:
  - (A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
  - (B) Provide employees with any organic vapor gas mask or any self contained breathing apparatus with a full facepiece to use for escape.
  - (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.
  - (D) Ensure that canisters used with non-powered air-purifying respirators have a minimum service life of four hours when tested at 150 ppm benzene at a flow rate of 64 liters per minute (LPM), a temperature of 25°C, and a relative humidity of 85%; for canisters used with tight-fitting or loose-fitting powered air-purifying respirators, the flow rates for testing must be 115 LPM and 170 LPM, respectively.

#### § 1910.1029 Coke oven emissions.

- (g) \* \* \*
- (3) Respirator selection. Employers must select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers may use a filtering facepiece respirator only when it functions as a filter respirator for coke oven emissions particulates.

#### § 1910.1043 Cotton dust.

- (f) \* \* \*
- (3) \* \* \*
- (i) Employers must:
  - (A) 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 facepieces for protection against cotton dust concentrations greater than five times (5X) the PEL.
  - (B) Provide HEPA filters for powered and non-powered air-purifying respirators used at cotton dust concentrations greater than ten times (10X) the PEL.

- (ii) Employers must provide an employee with a powered air-purifying respirator (PAPR) instead of a nonpowered air-purifying respirator selected according to paragraph (f)(3)(i) of this standard [29 CFR 1910.1043] when the employee chooses to use a PAPR and it provides adequate protection to the employee as specified by paragraph (f)(3)(i) of this standard [29 CFR 1910.1043].

#### § 1910.1044 1,2-Dibromo-3-chloropropane.

- (h) \* \* \*
- (3) Respirator selection. Employers must:
  - (i) Select, and provide to employees, the appropriate atmosphere-supplying respirator specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
  - (ii) Provide employees with one of the following respirator options to use for entry into, or escape from, unknown DBCP concentrations:
    - (A) A combination respirator that includes a supplied-air respirator with a full facepiece operated in a pressure demand or other positive-pressure or continuous-flow mode, as well as an auxiliary self-contained breathing apparatus (SCBA) operated in a pressure-demand or positive-pressure mode.

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(B) An SCBA with a full facepiece operated in a pressure-demand or other positive-pressure mode.

#### § 1910.1045 Acrylonitrile.

(h) \* \* \*

(2) \* \* \*

(i) Employers must implement a respiratory protection program in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m).  
\* \* \*

(3) Respirator selection.  
Employers must:

- (i) Select, and provide to employees the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
- (ii) For escape, provide employees with any organic vapor respirator or any self-contained breathing apparatus permitted for use under paragraph (h)(3)(i) of this standard [29 CFR 1910.1045].

#### § 1910.1047 Ethylene oxide.

(g) \* \* \*

(3) Respirator selection.  
Employers must:

- (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.

(ii) Equip each air-purifying, full facepiece respirator with a front-or back-mounted canister approved for protection against ethylene oxide.

(iii) For escape, provide employees with any respirator permitted for use under paragraphs (g)(3)(i) and (ii) of this standard [29 CFR 1910.1047].

#### § 1910.1048 Formaldehyde.

(g) \* \* \*

(2) Respirator program.

- (i) Employers must implement a respiratory protection program in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m).
- (ii) When employees use air-purifying respirators with chemical cartridges or canisters that do not contain end-of-service-life indicators approved by the National Institute for Occupational Safety and Health, employers must replace these cartridges or canisters as specified by paragraphs (d)(3)(iii)(B)(1) and (B)(2) of 29 CFR 1910.134, or at the end of the workshift, whichever condition occurs first.

(3) Respirator selection.

(i) Employers must:

- (A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Equip each air-purifying, full facepiece respirator with a canister or cartridge approved for protection against formaldehyde.

(C) For escape, provide employees with one of the following respirator options: A self-contained breathing apparatus operated in the demand or pressure-demand mode; or a full facepiece respirator having a chin-style, or a front-or back-mounted industrial size, canister or cartridge approved for protection against formaldehyde.

(ii) Employers may substitute an air purifying half mask respirator for an air-purifying, full facepiece respirator when they equip the half mask respirator with a cartridge approved for protection against formaldehyde and provide the affected employee with effective gas-proof goggles.

(iii) Employers must provide employees who have difficulty using negative pressure respirators with powered air-purifying respirators permitted for use under paragraph (g)(3)(i)(A) of this standard and that affords adequate protection against formaldehyde exposures.

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#### § 1910.1050 Methylene dianiline.

(h) \* \* \*

(3) \* \* \*

(i) Employers must:

(A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

(B) Provide HEPA filters for powered and non-powered air-purifying respirators.

(C) For escape, provide employees with one of the following respirator options: Any self-contained breathing apparatus with a full facepiece or hood operated in the positive-pressure or continuous-flow mode; or a full facepiece air-purifying respirator.

(D) Provide a combination HEPA filter and organic vapor canister or cartridge with powered or non-powered air purifying respirators when MDA is in liquid form or used as part of a process requiring heat.

#### § 1910.1052 Methylene chloride.

(g) \* \* \*

(3) Respirator selection.

Employers must:

(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.

(ii) For emergency escape, provide employees with one of the following respirator options: A self-contained breathing apparatus operated in the continuous-flow or pressure-demand mode; or a gas mask with an organic vapor canister.

#### Maritime Substance Specific Standards

PART 1915—[AMENDED]

Subpart Z—[Amended]

#### § 1915.1001 Asbestos.

(h) \* \* \*

(2) Respirator selection.

(i) Employers must select, and provide to employees at no cost, 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.

(ii) Employers are to provide HEPA filters for powered and non-powered air-purifying respirators.

(iii) Employers must:

(A) Inform employees that they may require the employer to provide a tight fitting, powered air-purifying respirator (PAPR) permitted for use under paragraph (h)(2)(i) of this standard [29 CFR 1910.1025] instead of a negative pressure respirator.

(B) Provide employees with a tight fitting PAPR instead of a negative pressure respirator when the employees choose to use a tight-fitting PAPR and it provides them with the required protection against asbestos.

(iv) Employers must provide employees with an air-purifying, half mask respirator, other than a filtering facepiece respirator, whenever the employees perform:

(A) Class II or Class III asbestos work for which no negative exposure assessment is available.

(B) Class III asbestos work involving disturbance of TSI or surfacing ACM or PACM.

(v) Employers must provide employees with:

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- (A) A tight-fitting, powered air purifying respirator or a full facepiece, supplied-air respirator operated in the 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).
- (B) A full facepiece, supplied-air respirator 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 assessment is not available and the exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA.

#### Construction Substance Specific Standards

PART 1926—[AMENDED]

Subpart D—[Amended]

#### § 1926.60 Methyleneedianiline.

- (i) \* \* \*
- (3) \* \* \*
- (i) Employers must:
- (A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
- (B) Provide HEPA filters for powered and non-powered air-purifying respirators.
- (C) For escape, provide employees with one of the following respirator options: Any self-contained breathing apparatus with a full facepiece or hood operated in the positive-pressure or continuous-flow mode; or a full facepiece air-purifying respirator.
- (D) Provide a combination HEPA filter and organic vapor canister or cartridge with air-purifying respirators when MDA is in liquid form or used as part of a process requiring heat.

#### § 1926.62 Lead.

- (f) \* \* \*
- (3) \* \* \*
- (i) Employers must:
- (A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
- (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.
- (C) Provide HEPA filters for powered and non-powered air-purifying respirators.
- Subpart Z—[Amended]

#### § 1926.1101 Asbestos.

- \* \* \* \* \*
- (h) \* \* \*
- (3) Respirator selection.
- (i) Employers must:
- (A) 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.
- (B) Provide HEPA filters for powered and non-powered air-purifying respirators.

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- (ii) Employers must provide an employee with tight-fitting, powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to paragraph (h)(3)(i)(A) of this standard [29 CFR 1910.1025] when the employee chooses to use a PAPR and it provides adequate protection to the employee.
- (iii) Employers must provide employees with an air-purifying half mask respirator, other than a filtering facepiece respirator, whenever the employees perform:
  - (A) Class II or Class III asbestos work for which no negative exposure assessment is available.
  - (B) Class III asbestos work involving disturbance of TSI or surfacing ACM or PACM.
- (iv) Employers must provide employees with:
  - (A) A tight-fitting powered air purifying respirator or a full facepiece, supplied-air respirator operated in the 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).
  - (B) A full facepiece supplied-air respirator 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 assessment is not available and the exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA.

### § 1926.1127 Cadmium.

- (g) \* \* \*
- (3) \* \* \*
- (i) Employers must:
  - (A) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
  - (B) Provide employees with full facepiece respirators when they experience eye irritation.
  - (C) Provide HEPA filters for powered and non-powered air-purifying respirators.

**For more information, please contact:**

**3M Occupational Health and Environmental Safety Division (OH&ESD)**

**In the U.S., contact:**

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