

**U.S. Department of Labor**

Occupational Safety and Health Administration  
Washington, D.C. 20210



Reply to the attention of:

DEP/GIE/SMK

JUL 14 2009

MEMORANDUM FOR:

JOHN M. HERMANSON  
Regional Administrator

A handwritten signature in cursive script that reads "Richard Fairfax".

FROM:

RICHARD FAIRFAX, Director  
Directorate of Enforcement Programs

SUBJECT:

SPRAY FINISHING OPERATIONS CITATION  
GUIDANCE

This is in response to your request for guidance in the issuance of citations related to spray finishing operations. You asked three questions:

1. Must either spray booths or spray rooms be used to enclose or confine all spraying operations covered by 29 CFR 1910.94 and 29 CFR 1910.107?
2. May a citation be issued for a violation of paragraph (b)(1) or paragraph (b)(2) of 29 CFR 1910.303 instead of 1910.107(c)(6) if:
  - a. the electrical equipment used in or near an area where the spray finishing operation is performed is not subject to deposits of combustible materials; and
  - b. the location where the spraying operation is performed does not meet the definition of a "spraying area" in 1910.107(a)(2)?
3. How should compliance officers document dangerous quantities of flammable vapors or mists; or combustible residues, dusts or deposits before citations under 1910.107(c) are issued?

In response to your first question, the health hazards of spray finishing operations are primarily covered under the OSHA standard at 1910.94, *Ventilation*, although that standard also deals with fire and explosion hazards. Only the latter hazards of spray finishing operations are covered by 1910.107, *Spray finishing using flammable and combustible materials*. 1910.94(c)(2) states that spray booths or spray rooms are to be used to enclose or confine all spray finishing using organic or inorganic materials. Since the primary purpose of 1910.94(c) is to protect health, failing to perform spraying operations in a spray booth or spray room would be considered a de minimis condition of 1910.94(c), if the appropriate PEL in Subpart Z of Part 1910 is not exceeded. See the attached letter to Dee Woodhull, dated March 28, 2008.

Thus, if no OSHA PEL is exceeded during spray finishing operations, only then does the OSHA standard at 1910.107 apply. That standard does not have an enclosure provision similar to 1910.94(c) requiring that all spray finishing using flammable and combustible materials be confined to spray booths or spray rooms. However, the 1910.107 standard allows spraying operations only in predetermined spraying areas. Paragraph 1910.107(g)(1) requires that “[s]praying shall not be conducted outside of predetermined spraying areas.” Paragraph 1910.107(a)(2) defines a “spraying area” as “[a]ny area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits are present due to the operation of spraying processes.” OSHA interprets “dangerous quantities of flammable vapors or mists” in 1910.107(a)(2), to be areas with concentrations exceeding 25% of the lower flammable limit (LFL) of any chemical used at any time during the spray finishing operations, without the benefit of ventilation required under the standard. See 1910.107(d)(2) (adequate ventilation shall be provided to remove flammable vapor, mists, or powder) and 1910.106(a)(31) (ventilation is adequate if it prevents significant quantities of vapor-air mixtures in concentration over one-fourth of LFL). OSHA interprets “combustible residues... [or]...deposits” as residues or deposits of any sprayed material whose MSDS or other sources indicate combustibility, and which have not been cleaned from the previous day’s spraying activities. See 1910.107(g)(2) (“All spraying areas shall be kept as free from the accumulation of deposits of combustible residues as practical, with cleaning conducted daily if necessary.”) For an explanation of dangerous quantities of combustible dusts, see the last paragraph of this memorandum.

However, one operation that does require an enclosure is the spraying of organic peroxides or other dual component coatings, which according to paragraph 1910.107(m) must be conducted in approved sprinklered spray booths. Section 16.2 of NFPA 33-2007, *Standard for Spray Application Using Flammable or Combustible Materials*, provides that spray application operations that involve the use of organic peroxide formulations and other plural component coatings may be performed in spray areas (and not spray booths) that are protected by approved automatic sprinkler systems. OSHA regards that provision as effective as 1910.107(m). Thus, with regard to fire and explosion hazards associated with spraying organic peroxides or other dual component coatings, if an employer has met all of the requirements of NFPA 33-2007, but the employer's spray finishing operation is not enclosed and not conducted within spray booths or spray rooms in accordance with 1910.107(m), then OSHA would consider the lack of enclosure as a de minimis condition and no citation shall be issued for this condition.

In answer to the first part of your second question concerning citation guidance for electrical violations in or near an area not subject to deposits of combustible materials, citations under 1910.107(c)(6) shall be issued because it is the vertical standard, rather than 1910.303 or .307(c)(2), which are horizontal standards. In accordance with 1910.107(c)(6), electrical and wiring equipment not subject to deposits of combustible dust residues but located in a spraying area shall be of explosion-proof type approved for Class I, group D locations and shall otherwise conform to the provisions of subpart S of this part, for Class I, Division 1, Hazardous Locations. In accordance with 1910.107(c)(6), electrical wiring, motors, and other equipment outside of but within 20 feet of a spraying area and not separated by partitions shall not produce sparks under normal operating conditions and shall otherwise conform to the provisions of subpart S of Part 1910 for Class I, Division 2 Hazardous Locations.

In response to the second part of your second question, which pertains to an area where a spraying operation is performed, but the location does not meet the definition of a spraying area, citations for violations of Subpart S shall be issued, as appropriate.

In order to issue a citation for a violation of 1910.107(c) or (d), the compliance safety and health officer (CSHO) must document the area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits may be present due to a spraying process. There must either be dangerous quantities of flammable vapors or mists or there must be combustible residues, dusts, or deposits in order to cite the employer for violations of the provisions noted above. In order to document flammable vapors or mists the CSHO must use a combustible gas detector (indicator). However, if a spraying operation is not being performed during an OSHA inspection, then CSHOs should determine the composition of the sprayed material from its MSDS or other sources, and refer to the example and the associated formula provided in 1910.94(c)(6)(ii) to determine whether the volume of air being ventilated is greater than or equal to the volume of air in cubic feet necessary to dilute the vapor from one gallon of any of the solvents in the sprayed material to 25% of the LFL. To document combustible residue or deposits, the CSHO must document whether the MSDS or other sources for the sprayed material indicate combustibility and whether the deposits or residue is removed daily. To document combustible dust accumulations, CSHOs should consult NFPA 654, *Standard for the Prevention of Fires and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids* (2006 Edition). Annex D of NFPA 654 contains guidance on dust layer characterization and precautions. The material in Annex D is an idealized approach based on certain assumptions, including uniformity of the dust layer covering the surfaces, a bulk density of 75 lb per cubic foot, a dust concentration of 0.35 oz/ per cubic foot, and a dust cloud height of 10 ft. It indicates that immediate cleaning is warranted whenever a dust layer of 1/32-inch thickness accumulates over a surface area of at least 5% of the floor area. Also, dust samples must be sent to the Salt Lake City Testing Center to determine if there are any violations of 1910.107(c), which deals in part with electrical sources of ignition.

If you have any questions, please contact Sanji Kanth of the Office of General Industry Enforcement at (202) 693-2135.

Attachment



UNITED STATES DEPARTMENT OF LABOR

OCCUPATIONAL SAFETY &amp; HEALTH ADMINISTRATION

www.OSHA.gov

A-Z Index: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Search OSHA

GO

## Standard Interpretations

## 03/28/2008 - Requirements for spray booth when spraying water-based paint.

[← Standard Interpretations - Table of Contents](#)

• **Standard Number:** [1910.94](#); [1910.94\(c\)](#); [1910.94\(c\)\(2\)](#); [1910.94\(c\)\(8\)](#); [1910.107](#)

March 28, 2008

Ms. Dee Woodhull, CIH, CSP  
 ORC Worldwide  
 1800 K Street, NW  
 Suite 810  
 Washington, DC 20006-2226

Dear Ms. Woodhull:

This is in response to your email of February 20, 2007, to the Occupational Safety and Health Administration's (OSHA's) Directorate of Enforcement Programs. As was explained in our interim response letter of May 16, 2007, your inquiry raised complex issues and required additional time for an adequate response. You requested clarification of OSHA's requirements for spray finishing operations, specifically asking if a spray booth is required when the substance being sprayed is water-based paint. Your scenario and questions have been paraphrased below, followed by our responses.

**Scenario:** Your client has a spray finishing operation that is performed periodically and uses fewer than 18 gallons of chemical product per week. The product being used is a water-based (non-flammable) liquid and has some toxic properties. The employer has performed air monitoring and no employee overexposures to the chemicals were obtained. Currently, this operation is not performed within the confines of a spray booth or a spray area (as defined by 29 CFR 1910.107, *Spray Finishing Using Flammable and Combustible Materials*), and no overspray accumulation has been detected in the work area in which the operation is performed.

**Question 1:** Should the determination whether to perform the spray operation in a booth be based on the employee's level of exposure to the hazardous chemicals in the paint or the mere presence of a hazardous chemical in the paint?

**Answer 1:** For purposes of OSHA's standard at 29 CFR 1910.94(c), which addresses ventilation requirements for spray finishing operations, the determination of whether such activities must be conducted in a spray booth or spray room is based on the presence of a hazardous chemical in the paint. Section 1910.94(c)(2) provides:

(2) *Location and Application.* Spray booths or spray rooms are to be used to enclose or confine all operations. Spray-finishing operations shall be located as provided in section 201 through 206 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969.

Also, Section 1910.94(c)(8), *Scope*, provides:

(8) *Scope.* Spray booths or spray finishing rooms are to be used to enclose or confine all spray finishing operations covered by this paragraph (c). This paragraph does not apply to the spraying of the exteriors of buildings, fixed tanks, or similar structures, nor to small portable spraying apparatus not used

repeatedly in the same location.

Although OSHA routinely requires ventilation when employees are exposed to chemicals at levels that exceed established permissible exposure limits (PELs), the known presence of a health hazard during spray finishing operations is also indicative of the need for spray booth ventilation as required by 29 CFR 1910.94(c)(2). Paragraph 1910.94(c)(2) states that "[s]pray booths or spray rooms are to be used to enclose or confine all operations." The source of the spray-finishing portion of the ventilation standard is the *American Standard Safety Code for the Design, Construction, and Ventilation of Spray Finishing Operations*, ANSI Z9.3-1971 which states, "[t]his standard is intended to protect the health of personnel from injurious effects of contact with gases, vapors, mists, dusts, or solvents used in, created, released, or disseminated by spray-finishing operations." According to this source standard, it is the presence of a toxic chemical which creates the possibility of injurious effects on employees from contact, thus triggering the requirements for spray booth ventilation.

When employees are exposed to chemicals at levels in excess of any of the established standards under 29 CFR 1910.1000(e), *Air Contaminants*, ". . . administrative or engineering controls must first be determined and implemented whenever feasible." The primary method used to control employee exposures to inhalation hazards is an adequate ventilation system.

**Question 2:** Is the employer required to use a spray booth when performing the spray-finishing operation described in the scenario?

**Answer 2:** There are many chemicals, that while not flammable, may still possess harmful properties that can result in occupational illnesses when inhaled or contacted. Water-based paints and other substances that are not considered flammable are applied in occupational settings through the use of spray application techniques and may present potential health hazards. Therefore, as explained in your scenario, if an employer is performing spray-finishing operations using chemicals that are not flammable, but possess possible inhalation health hazards, then the ventilation requirements of 1910.94(c), *Ventilation*, would apply.

Your email references an existing memorandum of interpretation by OSHA dated June 9, 1978 identifying the requirement to have a spray booth when water-based paints that contain toxic substances are sprayed. Our answer to your inquiry above is consistent with that interpretation. Your client has made an assessment that no hazardous conditions exist during the spraying of their water-based chemicals. It is imperative the employer document that, during any expected conditions of use (of the water-based chemical) at the worksite, no adverse health effects have been, or could be, experienced by employees. Although the employer would be considered to be in violation of 29 CFR 1910.94(c) for failing to perform painting operations in a spray booth when using paint containing toxic substances, such a violation would be considered *de minimis*, provided that the hazard assessment has in fact demonstrated that no hazardous health effects could result during the application. *De minimis* violations are those which have no direct or immediate relationship to safety or health. In such instances, OSHA does not issue citations, but rather a notice that does not require abatement.


Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you may consult OSHA's website at <http://www.osha.gov>.

Sincerely,

Richard E. Fairfax, Director  
Directorate of Enforcement Programs

---

← [Standard Interpretations - Table of Contents](#)

 [Back to Top](#)

[www.osha.gov](http://www.osha.gov)

[www.dol.gov](http://www.dol.gov)

---

[Contact Us](#) | [Freedom of Information Act](#) | [Customer Survey](#)  
[Privacy and Security Statement](#) | [Disclaimers](#)

---

Occupational Safety & Health Administrations  
200 Constitution Avenue, NW  
Washington, DC 20210