



MNOSHA Instruction **CPL 2-2.68A**

February 15, 2017

Reissued in accessible format: January 26, 2022

SUBJECT: Inspection Procedures for Occupational Exposure to Methylene Chloride Part 1910.1052, 1915.1052, and Part 1926.1152

Purpose:

To ensure uniform enforcement of the Occupational Exposure to Methylene Chloride Standard by setting enforcement policy, providing inspection guidelines, and clarifying and interpreting the regulatory text.

Scope:

This instruction applies MNOSHA-wide.

References:

1. Federal OSHA Instruction 02-02-070 (fka CPL 2-2.70), "Inspection Procedures for Occupational Exposure to Methylene Chloride, Parts 1910.1052, 1915.1052, and 1926.1152.
2. *Federal Register*, dated January 10, 1997, "Occupational Exposure to Methylene Chloride, Final Rule; Federal Register, dated December 18, 1997, "Methylene Chloride, Partial Stay;" and Federal Register dated September 22, 1998, "Methylene Chloride; Final Rule."
3. *Federal Register*, dated January 8, 1998, "Respiratory Protection; Final Rule."
4. MNOSHA "Field Safety and Health Manual."
5. Methylene Chloride, OSHA Publication 3144-06R, 2003, Informational booklet [Methylene Chloride \(osha.gov\)](https://www.osha.gov).

6. Letters of interpretation including Determination of airborne concentrations of methylene chloride; protection of employees covered by 1910.1052. (May 12, 2003) .

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=2456

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Cancellation:

This instruction supersedes MNOSHA Instruction CPL 2-2.68B, “Inspection Procedures for Occupational Exposure to Methylene Chloride Part 1910.1052, 1915.1052, and Part 1926.1152” dated November 9, 2011.

Background:

The final Occupational Exposure to Methylene Chloride Standards, 29 CFR 1910.1052, 29 CFR 1915.1052, and 29 CFR 1926.1152 supersede the regulations for employee exposure to methylene chloride (MC), also known as dichloromethane (DCM), that were contained in the OSHA air contaminant standards 29 CFR 1910.1000, 29 CFR 1915.1000, and 29 CFR 1926.55, for General Industry, Shipyards, and the Construction Industry, respectively. The final rule establishes permissible exposure limits (PELs) of 25 ppm (8-hour time weighted average -- TWA) and 125 ppm (15-minute short term exposure limit -- STEL). In addition, the standard provides for medical removal protection (MRP) benefits for employees and contains other provisions typical of those found in OSHA health standards promulgated under section (6)(b)(5) of the Act. Depending on exposure conditions at the workplace, these other provisions include requirements for:

1. Monitoring the workers' exposures;
2. Establishing regulated areas to reduce the number of workers potentially exposed;
3. Implementing engineering and work practice controls to achieve the necessary reductions in exposure;
4. Providing respiratory protection and protective clothing and equipment where necessary;
5. Making hygiene facilities available where necessary;
6. Making medical surveillance available;
7. Communicating information about methylene chloride to workers and training them in its safe use; and
8. Keeping records related to the standard.

OSHA published the standard in the *Federal Register* on January 10, 1997 and made it effective on April 10, 1997. Later, on December 18, 1997, OSHA granted a partial administrative stay of the standard. The stay applied to employers of specified sizes in certain identified application groups, i.e., those that use methylene chloride in certain work operations. It delayed the startup dates by which these employers (1) must use respirators to protect employees exposed above the 8-hour TWA PEL and (2) must have instituted feasible engineering controls for achieving the STEL and the 8-hour TWA PEL. Then subsequently, on September 22, 1998, OSHA published in the *Federal Register* amendments to the standard. Among other changes, OSHA set new startup

dates to replace the ones affected by the administrative stay. All startup dates have passed and the standard is in effect in the construction, general industry and maritime industries.

The amendments also:

1. Modify the medical surveillance provisions to incorporate temporary medical removal protection (MRP). The temporary MRP is accorded employees who are removed or transferred to another job because of a medical determination that exposure to methylene chloride may aggravate or contribute to the employee's existing skin, heart, liver, or neurological disease. The compliance date for the new MRP provisions was October 22, 1998 for all employers.
2. Require employers who have been granted a time extension for implementing engineering controls and respiratory protection in order to achieve the 8-hour TWA PEL, and who have done exposure monitoring indicating that the STEL is not exceeded, to nonetheless continue to monitor the STEL exposures at 3-month intervals until they have implemented such engineering controls and/or respiratory protection. The startup date for these employers to resume STEL exposure monitoring was October 22, 1998.

ACTION:

A. General Considerations.

The final standards, 1910.1052, 1926.1152, and 1915.1052 apply to all occupational exposures to methylene chloride in general industry, the construction industry, and shipyard employment, respectively. Shipyards are entities engaged in shipbuilding, ship repair, or shipbreaking. The General Industry Standard, 1910.1052, applies to marine terminal and longshoring employment only insofar as affected employees are exposed to hazards that are not addressed by compliance with Parts 1917 and 1918, respectively. OSHA will be finalizing standards for marine terminals and longshoring operations, setting forth the requirements applicable to chemical handling in the cargo handling environment. None of the standards applies to Agriculture Employment, which is covered under Part 1928.

B. Inspection Guidelines:

1. Collection of Information from the Employer.

During the opening conference, collect information that will be of assistance when conducting the inspection. Request the employer to provide:

- a. A copy of any written program for improving or instituting engineering and work practice controls to limit employee exposure to methylene chloride; (**Note:** The standard does not require the employer to develop a written compliance program. However, whenever monitoring

- results indicate that employee exposure is above the STEL or the 8-hour TWA PEL, then in accordance with 29 CFR 1910.1052(d)(5)(ii), the employer must describe in the written employee notification of the monitoring results the corrective action being taken to reduce employee exposure to or below the STEL or 8-hour TWA PEL and the schedule for completion of this action.)
- b. Prior to the walk-around, copies of employee exposure monitoring data including data from a consultation visit, objective data, and any other employee exposure assessment data that may be available. (**Note:** You may need these data to develop a strategy for inspecting the workplace and determining the level of protection required to safely conduct the inspection.)

2. Inspection of a Workplace Where the Employer Has Not Assessed the Methylene Chloride Exposure.

- a. Some employers will not have established regulated areas nor determined the airborne levels of methylene chloride in their workplaces. In this situation it may be very difficult to recognize by observation whether in a specific area the methylene chloride air concentrations are above or below the relevant PELs. If this is the case, at the preliminary stage of the inspection, screen the methylene chloride air concentration levels to help in deciding how to proceed with the inspection.
- b. The following OSHA publications were developed after the promulgation of the Methylene Chloride final rule and are available to assist employers in a variety of industries with methylene chloride compliance issues. If the industry to be inspected is one of the following, the OSHI may want to refer to these documents prior to conducting the inspection. These publications will provide guidance on issues related to methylene chloride exposures and their control measures.

OSHA Publication: 3144-06R; Methylene Chloride and;

The Methylene Chloride Small Entity Compliance Guide Fact Sheets

https://www.osha.gov/SLTC/methylenechloride/factsheets/meth_facts.html :

- No. 1 – Exposure Monitoring Requirements
- No. 2 – Medical Surveillance Requirements
- No. 3 – Suggested Engineering Controls for Furniture Refinishers
- No. 4 – Suggested Work Practices for Furniture Refinishers
- No. 5 – Suggested Engineering Controls and Work Practices for Construction Sites
- No. 6 – Suggested Engineering Controls for Flexible Polyurethane Foam Manufacturers
- No. 7 – Suggested Work Practices for Flexible Polyurethane Foam Manufacturers

No. 8 – Suggested Engineering Controls for Cold Degreasing and Other Cold Cleaning Operations

No. 9 – Suggested Work Practices for Cold Degreasing and Other Cold Cleaning Operations

No. 10 – Suggested Engineering Controls for Vapor Degreasing Operations

No. 11 – Suggested Work Practices for Vapor Degreasing Operations
Respiratory Protection- Respirator Fit Testing Procedures

- c. The best approach for conducting an inspection where the methylene chloride exposure hazard is uncertain will have to be determined on a case-by-case basis. OSHIs should keep close track of the air concentration levels with a direct reading instrument. OSHA's Cincinnati Technical Center has determined that using detector tubes is the simplest direct reading method. The Salt Lake City Technical Center has confirmed that the Gastec detector tube (#138) does not indicate methylene chloride at the action level (12.5 ppm) and TWA (25 ppm) levels. Testing has shown that the Draeger (# 6724601) and the Kitigawa (#180s) detector tubes do show indications of methylene chloride at these levels. NOTE: The Draeger tubes at 20 strokes have a detection range of 50 – 1000 ppm.

Use this information to avoid methylene chloride exposures above the PELs. At this time supplied air respiratory protection required for methylene chloride exposure is not available to OSHI's. If it is determined that respiratory protection is required before the OSHI can conduct the inspection, selection and use of appropriate respiratory protection shall be in accordance with Chapter 4 of the Field Safety and Health Manual and approved by the Respirator Program Coordinator or the OMT Director/Supervisor. In many cases you may need to conduct remote sampling of employee exposures to methylene chloride in order to avoid overexposure and the need for a respirator.

3M recommends ½ mask respirator with gas & vapor 6051 cartridges for "low level" or "nuisance level" methylene chloride. This is not adequate for levels over the PEL.

When you need to monitor your methylene chloride exposure for your protection, keep a record of the time spent in various air concentrations of methylene chloride for calculating your 8-hour TWA and short-term exposures.

3. Remote sampling.

- a. Remote sampling may be used to document violations if the problems associated with this approach will not be significant or can be resolved in the case at hand.
- b. In a case where you cannot find a location to observe the work processes or the employees at their work:

1. Be on guard against events such as the following going unnoticed:
 - i. Tampering with the sampling device such as turning the pump off or placing the sampler nearer or farther away from the point that would best indicate an employee's exposure.
 - ii. Pump failure or malfunction.
 - iii. An employee failing to return at the appropriate time for changing the sampling media.
2. There may be complications in determining whether the employer has instituted all feasible work practices and engineering controls.
- c. If you can set up an employee with sampling equipment, place yourself far enough away from an operation to avoid overexposure, but close enough to observe the operation, then remote sampling may not present any problems. However, this would only be the case if you can watch the sampling process well enough to ensure the validity of the samples, and you can examine the work processes and equipment well enough to evaluate the work practices and engineering controls. In a situation where you want to get a closer look at the sampling device, work process, or plant equipment, it may be possible to approach them for a brief time and still avoid overexposure. If this is too risky, it might be possible for you to get a better look through the zoom lens of your camera.

4. Additional Inspection Guidance.

Appendix B contains additional information you may find helpful in evaluating the employer's compliance with the Methylene Chloride Standard.

C. Specific Provisions of 29 CFR 1910.1052.

Guidelines and clarifications relating to specific provisions of the standard are provided in Appendix A, "Questions and Answers," and Appendix B, "Evaluating Methylene Chloride Hazards and the Effectiveness of the Protective Measures Used."

D. Guidelines for Classifying and Grouping Violations.

In general, follow the procedures in Field Compliance Manual. If deviations appear appropriate, discuss and coordinate them with your OMT Director/Supervisor.

E. Required Training and Experience for OSHIs.

OSHIs who conduct methylene chloride inspections are expected to know the following:

1. The potential hazards which you may encounter at the site, including the potential hazards of methylene chloride.
2. The contents of the Methylene Chloride standard, including the appendices.
3. The contents of this instruction.
4. The appropriate protective equipment you must wear. Each OSHI who uses protective equipment must be trained in the proper care, use, and limitations of the equipment as well as the appropriate emergency procedures.

James Krueger, Director MNOSHA Compliance
For the MNOSHA Management Team

Distribution: OSHA Compliance and WSC Director

Attachments: Appendix A – Questions and Answers
Appendix B – Evaluating the Methylene Chloride Hazards and the Effectiveness of the Protective Measures Used

NOTICE: Minnesota OSHA Directives are used exclusively by MNOSHA personnel to assist in the administration of the OSHA program and in the proper interpretation and application of occupational safety and health statutes, regulations, and standards. They are not legally binding declarations and they are subject to revision or deletion at any time without notice.

APPENDIX A: Questions and Answers

BACKGROUND INFORMATION

Q. What are the adverse health effects associated with exposure to methylene chloride?

A. The effects include cancer, cardiac and central nervous system disturbances, and skin or eye irritation.

Q. Why does the standard contain a short-term exposure limit (STEL) of 125 ppm, measured over a 15-minute period?

A. The STEL protects employees from the acute toxicity of methylene chloride, the carcinogenic metabolites of methylene chloride, and complements the protection from methylene chloride's carcinogenic effects provided by compliance with the 8-hour time-weighted average (TWA) exposure limit of 25 ppm.

Q. How does the STEL protect employees from the carcinogenic metabolites of methylene chloride?

A. Metabolic evidence suggests that the mixed function oxidase system (MFO) pathway (the metabolic pathway not believed to be a major contributor to carcinogenesis) begins to be saturated at approximately 100 ppm and metabolism by the glutathione-S-transferase (GST) pathway (the putative carcinogenic pathway) becomes more important quantitatively at that level. Compliance with the STEL limits metabolism by the GST pathway and protects the employee from excessive exposure to potentially carcinogenic metabolites of methylene chloride.

Q. What are the acute toxic effects of methylene chloride?

A. Acute toxicity of methylene chloride is characterized by central nervous system (CNS) disturbances, such as decreased alertness and coordination, headaches, and dizziness, which may ultimately lead to accidents and further exposure to methylene chloride. Methylene chloride also increases carboxyhemoglobin levels. Carboxyhemoglobin can interfere with the oxygen carrying capacity of blood and is a particular problem for pregnant women, smokers, those whose blood has limited oxygen carrying capacity, and individuals with asymptomatic or undiagnosed cardiac disease. The eyes and skin are also irritated by contact with liquid methylene chloride.

Q. How does exposure to methylene chloride occur?

A. Employee exposure can occur through inhalation or skin absorption.

Q. What are common uses for methylene chloride?

A. It is frequently used as a process solvent, a degreasing agent, a cleaning solvent, a component of paint strippers, in propellant mixtures in containers for spraying aerosols such as adhesives, and as an auxiliary blowing agent in polyurethane foam manufacturing.

Q. What types of work operations are sources of overexposure to methylene chloride?

A. Many different kinds of work operations, such as methylene chloride manufacturing, furniture paint stripping, metal cleaning, foam blowing, and pharmaceutical manufacturing may overexpose employees to methylene chloride.

REGULATORY TEXT INFORMATION

Scope and Application

Q. How is the extent of the standard's coverage of an employer determined?

A. The extent of coverage depends on the level of employee exposure to methylene chloride. The highest level of coverage occurs when employees are exposed above both the 8-hour TWA PEL and the STEL and could contact liquid methylene chloride. In that case all the requirements of the standard apply. The lowest level of coverage occurs when employees are exposed below both the action level (AL) and the STEL and are not subject to skin contact with liquid methylene chloride. In that case, employers are only required to document that the exposures are that low and to provide employee information and training.

Q. What workplaces are covered by the standard?

A. The standard applies to all workplaces covered by OSHA in general industry, construction, and shipyards, where methylene chloride is produced, released, stored, handled, used, or transported. It applies to workplaces in the marine terminal and longshoring industries only where the industry-specific standards do not address hazards to which employees are exposed. The standard does not apply to the agriculture industry. (See page 1572 of Federal Register, Volume 62, Number 7, January 10, 1997.)

Exposure Monitoring

Q. Which employers in the covered industry sectors must make an initial determination of their employees' exposures to methylene chloride?

A. All employers in the covered industry sectors with workplaces where methylene chloride is known to be present must make an initial determination of employee exposure.

Q. When is exposure monitoring not required in order to make initial determinations of employee exposure to methylene chloride?

A. Initial exposure monitoring is not required where:

- The employer has objective data which demonstrate that employees cannot be exposed at or above the action level or the STEL for methylene chloride; or
- The employer has performed exposure monitoring which meets the requirements of this section within the year prior to the effective date of the final rule. The monitoring must have been of workplace conditions that are similar to conditions existing at the time the rule becomes effective.

Q. When is it not necessary to monitor employee exposure to methylene chloride with the accuracy specified in the standard?

A. The accuracy of monitoring requirement of the standard does not apply when the workplace or work operation is transient and employees are exposed on fewer than 30 days a year. In this situation, employers are permitted to use direct reading instruments, such as detector tubes, to estimate exposure and determine what protective measures to provide. While these simple measurement tools are often not as accurate as other types of monitoring methods, they have the advantage of immediate results and no delay in the provision of protection. Since some short-term jobs, such as construction projects, may not last long enough for analytical results to be returned from conventional monitoring methods, these direct reading instruments provide an effective compromise that will nevertheless ensure protection for employees in these types of operations.

Q. What conditions must objective data satisfy in order to exempt an employer from the requirement to perform initial monitoring of employee exposure to methylene chloride?

A. The objective data must establish the highest methylene chloride exposures likely to occur in the workplace under reasonably foreseeable conditions of processing, use, or handling. The employer

must document the data and subsequent analysis that leads to the conclusion that employees cannot be exposed at or above the action level or the STEL for methylene chloride.

Q. What would be an example of when objective data might be used to provide an exemption from the initial employee exposure monitoring requirement?

- A. In a number of products made from, containing, or treated with methylene chloride, it is likely that an insignificant amount of methylene chloride will be present and that there will be minimal exposure. Where this is the case, the exemption provides fabricators or users of the products a means to avoid the burdens of compliance with the standard. The determination that airborne concentrations of methylene chloride will not exceed the action level or the STEL need not be based on data generated by the employer but may, for example, be based upon information provided by the manufacturer of the product in question.

Q. What are the minimum conditions for when a personal breathing zone air sample taken for one employee can be considered representative of another employee's 8-hour time-weighted average (TWA) exposure to methylene chloride?

- A. A personal breathing zone air sample may be considered to be representative of another employee's 8-hour TWA exposure when the employer has taken one or more personal breathing zone air samples throughout the duration of exposure for at least one employee who is expected to have the highest methylene chloride exposures in the same job classification in the same work area during every work shift. As long as the employees in the same job classification have similar exposures, the employer may use the result from the employee who was selected for exposure sampling to represent the exposure of the group of employees.

Q. May an employer also use one or more employees to represent the maximum 15-minute exposure to methylene chloride of all of the employees in each job classification in a work area during every work shift?

- A. Yes. The personal breathing zone air samples taken must indicate the highest likely 15-minute exposures that would occur to employees in that job classification during the work shift.

Q. May an employer use representative monitoring to comply with a requirement to perform initial monitoring of employee exposures to methylene chloride?

- A. Yes, although the **best** way to characterize employee exposure is to measure each individual employee's exposure.

Q. In accordance with 29 CFR 1910.1052(d)(4)(i), the employer must perform exposure monitoring when a change in workplace conditions indicates that employee exposure may have increased. Is this additional monitoring required after every change in production, process, etc.?

A. Additional monitoring is not required after those changes in production, process, etc., for which the employer has another sound basis for concluding that the changes have not resulted in a significant increase in employee exposures.

Q. What is a significant increase in employee exposures?

A. OSHA interprets a significant increase in employee exposures to be an instance where at least :

- one previously unexposed employee is exposed at or above the action level for methylene chloride;
- one employee's exposure increases from below the action level to at or above the action level;
- one employee's exposure increases from below one or both of the PELs to above one or both of the PELs;
- one employee's exposure increases to a level where the employee needs to switch to a respirator assigned a higher protection factor; or
- one employee exposed at or above the action level or above the STEL incurs a 50 percent or greater increase in exposure.

Q. According to 29 CFR 1910.1052(d)(6)(i), the employer must provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to methylene chloride conducted in accordance with the standard. May employers choose who will be provided the opportunity to observe the monitoring?

A. No. The affected employees choose who will observe the monitoring.

Regulated Areas

Q. Must every employee entering the regulated area wear a respirator?

A. Where a reliable estimate of the air concentration of methylene chloride and the time to be spent by the employee in the regulated area shows that there is no potential for overexposure, the employee is not required to wear a respirator while in the regulated area.

Q. Must the regulated area consist of a fixed location or locations within the plant?

- A. No, the extent of a regulated area may vary depending on the work activity involved. For example, an area in which employee methylene chloride exposures are not normally over the 8 hour TWA or STEL, because the methylene chloride is contained inside sealed equipment, may need to be designated as a regulated area during work which requires opening the equipment.

Q. Must an employee who is exposed over the 8 hour TWA limit wear a respirator at all times while in the regulated area?

- A. Yes. However, as explained in the preceding answer, the extent of the regulated area may vary during the work shift. If an employee's work station is only within a regulated area during a portion of the work shift, the employee need only use a respirator during that period.

Q. If the location or boundaries of the regulated area change(s) during the work day, how must the regulated area be demarcated?

- A. The employer must demarcate the regulated area in any manner that adequately establishes and alerts employees to the boundaries. Movable signs, temporary barriers, or a system of warning lights are among the methods employers could use to demarcate a regulated area that changes in size during the work day.

Q. What factors must employers consider in determining how to demarcate regulated areas?

- A. Employers must consider such factors as the configuration of the area, whether the regulated area is permanent, the airborne methylene chloride concentration, the number of employees in adjacent areas, and the period of time the area is expected to have exposure levels above either PEL.

Q. What employee activities must the employer prohibit in regulated areas?

- A. The employer must ensure that within a regulated area employees do not engage in non-work activities which may increase dermal or oral exposure to methylene chloride. For example, the employer must ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.

Methods of Compliance

Q. Does the methylene chloride standard require written compliance plans?

- A. No. In 1991 OSHA proposed a requirement that employers establish and implement a written compliance plan which would describe how employee overexposures to airborne methylene

chloride would be reduced or brought below the PELs. However, the Agency removed this provision from the final rule in order to reduce employer paperwork. Regardless of size, employers are not required to produce written compliance plans. [**Note:** According to 29 CFR 1910.1052(d)(5), within 15 working days after an employer receives monitoring results, it must notify the employee in writing of these results, and if the results indicate an overexposure, the employer must describe in the written notification the corrective action being taken to reduce employee exposure to or below the 8-hour TWA PEL or STEL and the schedule for completion of this action.]

Respiratory Protection

Q. When does the standard require employers to use supplied-air respirators to protect employees overexposed or subject to overexposure to methylene chloride?

A. The standard requires that for all circumstances except during emergency escape, the employer must use supplied-air respirators to protect employees overexposed or subject to overexposure to methylene chloride.

Q. Why does the standard require employers to use supplied air respirators?

A. The standard requires supplied air respirators because methylene chloride breaks through the chemical cartridges and canisters used on air purifying respirators in too short a time for these respirators to provide reliable protection. Moreover, methylene chloride provides inadequate warning of when it breaks through chemical cartridges and canisters because the odor threshold concentration level is higher than the PEL values.

Q. May employers use the controlled negative pressure (CNP) method or the ambient aerosol method for quantitative fit testing of respirators?

A. These instruments are permitted for quantitative fit testing. Protocols for their use are contained in Appendix A of the revised respiratory protection standard (29 CFR 1910.134) that was published in the Federal Register on January 8, 1998.

Medical Surveillance

Q. What action must employers take to comply with 29 CFR 1910.1052(j)(1)(iii), which requires employers to make medical surveillance available to employees who may be exposed to methylene chloride during an emergency?

- A. Employers who have identified operations where a potential for an emergency involving methylene chloride exists must take the necessary action to ensure that, in the event of an emergency, facilities will be available and medical assistance will be rendered to exposure victims promptly by physicians or other licensed health care professionals knowledgeable about the toxic effects of methylene chloride.

Hazard Communication

Q. Does the Methylene Chloride Standard contain requirements for labeling and for preparing safety data sheets (SDSs)?

- A. Employers who have already met the requirements of the Hazard Communication Standard (29 CFR 1910.1200) will have no additional duties with regard to labels and SDSs under the Methylene Chloride Standard. The Methylene Chloride Standard simply indicates what specific hazard information must be provided on labels and safety data sheets.

Employee Information and Training

Q. How does the employer determine when employee information and training must be updated?

- A. The standard does not provide a specific time period for updating the training and information. Instead, it requires that information and training be updated as necessary to ensure that each employee exposed above the action level or the STEL maintains a good understanding of the principles of safe use and handling of methylene chloride in the workplace. Employers can assess exposed employees' understanding in various ways, such as observing their actions in the workplace. For example, a pattern of not using appropriate protective equipment or following safe work practices may be an indication that additional information and training is required.

This is a performance-oriented requirement that allows each employer to determine how much additional training and information to provide and how often to provide it. The employer must also update the training as necessary whenever there are workplace changes, such as modifications of tasks or procedures or the institution of new tasks or procedures, which increase employee exposure, and where those exposures exceed or can reasonably be expected to exceed the action level.

Recordkeeping

Q. Does the methylene chloride standard permit electronic retention and transmission of records?

A. Electronic retention and transmission of records is acceptable provided the confidentiality of medical records is retained and there is compliance with all relevant provisions of the standard.

Q. How does the required exposure monitoring record for employers with fewer than 20 employees differ from the required exposure monitoring record for employers with 20 or more employees?

A. Employers with fewer than 20 employees may provide and maintain less information. These employers may exclude the following information from the record:

- The operation involving exposure to methylene chloride which is being monitored;
- Sampling and analytical methods used and evidence of their accuracy; and
- Type of personal protective equipment, such as respiratory protective devices, worn, if any.

In OSHA's view, an employer with fewer than 20 employees is very likely to know intimately the operations of the business, including information about exposure monitoring and the use of personal protective equipment. Therefore, the information can be excluded from the employee's records without compromising employee safety and health.

Q. Are laboratory test results obtained for the purpose of medical surveillance of employees exposed to methylene chloride included in the written medical opinion provided to the employer?

A. The written medical opinion provided the employer must not include **any** laboratory test results.

Q. Must the employer ensure the preservation, retention, and accessibility of laboratory test results obtained for the purpose of medical surveillance of employees exposed to methylene chloride?

A. The Methylene Chloride Standard does not list laboratory test results among the items that must be included in the medical surveillance record. However, the laboratory test results are employee medical records that must be retained, preserved, and made accessible in accordance with 29 CFR 1910.1020, "Access to Employee Exposure and Medical Records."

APPENDIX B: Evaluating the Methylene Chloride Hazards and the Effectiveness of the Protective Measures Used

Air Sampling

- A. If the air concentrations of methylene chloride measured in the work area with detector tubes or other direct reading instruments are below the 12.5 ppm action level, then you should use professional judgment to determine what additional sampling to perform. Because concentrations of methylene chloride in air can vary dramatically, and because direct monitoring and detector tube sensitivities have limited accuracy at low levels, in some cases you will find it appropriate to conduct personal sampling of the workers to establish whether the action level has been exceeded.
- B. Two types of sampling tubes are available for personal sampling. For STEL sampling, you may use a Carbosieve S-III synthetic charcoal sampling tube (OSHA method #80). For 8-hour TWA sampling, this sample tube must be changed hourly based upon the recommended flow rate of 0.05 L/min, or a two hour sample can be obtained with this sample tube using a 0.025 L/min sampling rate.
- C. An alternative sampling tube for both STEL and for 8-hour TWA monitoring is the large three-section sample tube containing conventional coconut shell charcoal (OSHA method #59). You can use this sample tube to sample for 3.3 hours at 0.05 L/min; you can also use it at a lower flow rate (0.025 L/min) to provide a 6.6 hour sampling time. At this reduced sampling rate, you can change the sampling tube at the lunch break, thus using two sample tubes to monitor each worker over an eight-hour work day.
- D. Area air sampling may be required to establish whether the boundary of the regulated area complies with 29 CFR 1910.1052(e). You can use the large OSHA method #59 sample tubes at a sampling rate of 0.025 L/min to obtain an area sample in a location suspected of exceeding either the 25 ppm 8-hour TWA or the 125 ppm STEL. Alternatively, you can use OSHA method #80 tubes and follow the sampling rates and time periods presented above for personal sampling. Also, you may find that direct reading measurements obtained with detector tubes or a photo ionization detector (PID) are useful for determining the location for conducting area monitoring.
- E. You can also collect gas bag samples as a means of obtaining air samples. You can then "analyze" these samples on site using a detector tube or a PID to determine if the air concentration is in excess of the 8-hour TWA PEL or the STEL. This method may be most appropriate in a situation where direct reading PIDs are not available to frequently monitor the methylene chloride concentration in the area over time, and you want to obtain a better picture of the exposure over time than is available from a single detector tube "grab sample" of the air.

Airflow Evaluation

- A. You can use smoke tubes to examine the performance of local exhaust ventilation controls by observing the ability of the local exhaust system to capture discharged smoke.
- B. You can also use smoke tubes to determine whether air flows from methylene chloride work or regulated areas to non-regulated areas.

Spill Evaluation

- A. Whereas (f)(3)(ii) requires that incidental spills be promptly cleaned by employees who use the appropriate personal protective equipment and are trained in proper methods of cleanup, you should exercise caution in determining the size of a spill which can be classified as incidental. Methylene chloride is a very volatile solvent and has a high vapor pressure (440 mm Hg at 25 C). Thus, a large pool of methylene chloride spilled on the floor in an enclosed room with no ventilation could produce an air concentration in excess of 500,000 ppm. At this extremely high concentration, an oxygen deficient environment would exist; in addition to producing a narcotic effect it would cause a rapid loss of consciousness and subsequent death.
- B. Another useful example to illustrate the potential hazards created by methylene chloride spills would be a scenario in which a worker spills a quart of methylene chloride in an enclosed room with dimensions of 15' length by 15' width by 10' ceiling. Because methylene chloride evaporates rapidly (70% as fast as ethyl ether), it can be expected that the entire volume will be rapidly dispersed into the air in the room, resulting in an air concentration of over 5,700 ppm, which exceeds the 2,300 ppm IDLH level reported in the NIOSH 1997 pocket guide. (1990 NIOSH Pocket Guides lists IDLH as 5,000 ppm).

Under this scenario, the spill would not be classified as an incidental spill under OSHA's interpretation of 1910.120; consequently evacuation would be the only appropriate response. Efforts to mitigate the consequences of this spill would require that the employer implement an emergency response as described in 1910.120.

- C. Direct reading PID air monitors can be useful in determining sources of leaks and spills.

Protective Clothing and Equipment Evaluation

- A. NIOSH studies indicate that skin absorption can be a significant route of exposure. It appears that dermal exposure to methylene chloride can occur without producing irritation. Color-indicating patches are available for evaluating the effectiveness of PPE against methylene chloride. OSHA's Salt Lake City Technical Center can provide recommendations on how to use these patches.

Supplied Air Systems Evaluation

- A. The breathing air for supplied air systems must meet the air quality requirements of Grade D or better as specified in CGA specification G-7.1-1989.
- B. Compressed air supplied by oil lubricated compressors must be monitored frequently for carbon monoxide if the compressors are not equipped with continuous carbon monoxide monitors.
- C. Entry of contaminants into the supplied air system must be prevented either by locating the compressor air intake in an uncontaminated area or by in-line purification. Proper location will probably be the only practical means of preventing contamination of the breathing air with methylene chloride because of the inability to effectively filter it from air.
- D. Air-line couplings must be incompatible with outlets of other gas services.
- E. NIOSH-approved respirators must be used. This approval process also applies to the air-line hose and the length of hose. See 42 CFR Part 84.
- F. NIOSH-approved respirators must only be repaired with approved replacement parts.