Methyl Bromide - Structural Fumigations

Questions and Answers

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Approval

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Referrals If you have any questions pertaining to this document, please contact your Senior Pesticide Use Specialist liaison.

Background Methyl bromide is a gaseous fumigant that kills insects, mites, rodents, nematodes, termites, weeds, and organisms that cause plant diseases. Because it is a colorless, odorless gas, methyl bromide is normally mixed with chloropicrin, a tear gas with a noticeable odor.

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Structural fumigations

Fumigation is used when structures suffer from extensive infestations of wood-destroying insects, including termites and powder post beetles. Infestations are often found during home inspections prior to their sale. More California fumigations occur in the populous south state because there are more dwellings, and because wood-destroying insects flourish in warmer temperatures.

There are two chemicals used to fumigate homes: methyl bromide and sulfuryl fluoride (trade name, Vikane). The majority of the structural fumigations in California are done with sulfuryl fluoride. Methyl bromide usage for termite eradication in homes and other structures in California amounted to less than 3 percent for structural fumigations in 1998.

Attachments

The following documents are attached:

TEXT OF FINAL REGULATIONS

TITLE 3. CALIFORNIA CODE OF REGULATIONS
DIVISION 6. PESTICIDES AND PEST CONTROL OPERATIONS
CHAPTER 1. PESTICIDE REGULATORY PROGRAM

SUBCHAPTER 1. DEFINITION OF TERMS
ARTICLE 1. DEFINITIONS FOR DIVISION 6

6000. Definitions

AFumiscope **7** @ is a monitoring instrument that measures the concentration of methyl bromide inside a structure in ounces per 1,000 cubic feet. (The analytical detection limit of a Fumiscope **7** is 250 parts per million [ppm]).

NOTE: Authority cited: Sections 11502, 12111, 12781, 12976, 12981, and 14005, Food and Agricultural Code.
Reference: Sections 11408, 11410, 11498, 11501, 11701, 11702(b), 11704, 11708(a), 12042(f), 12103, 12971, 12972, 12973, 12980, 12981, 13145, 13146, and 14006, Food and Agricultural Code. (Approved 8/15/00; Effective 9/14/00)

SUBCHAPTER 4. RESTRICTED MATERIALS
ARTICLE 4. USE REQUIREMENTS

Section 6454. Chloropicrin and Methyl Bromide--Structural Fumigation.

This section supplements the methyl bromide fumigation requirements found in the Business and Professions Code and Title 16 of the California Code of Regulations, as well as directions for use given on methyl bromide product labeling.

(a) When fumigating a structure, the fumigator shall ensure that the distance between the fumigated structure and its property line shall meet the following criteria and that no person, other than the fumigation crew, enters the area prescribed in either (1), (2), or (3) below during the treatment period:

(1) For fumigations utilizing 50 pounds of methyl bromide or less, a distance of at least five (5) feet must exist; or

(2) For fumigations utilizing more than 50 pounds, but less than 80 pounds, a distance in feet calculated using the following formula must exist: five (5) times the total poundage of methyl bromide minus 240 feet; or

(3) For fumigations utilizing 80 pounds or more, a distance in feet equal to two (2) times the total poundage of methyl bromide applied must exist.

(b) Structures shall be covered with the required tarpaulins or sealed prior to fumigation. The Aacceptable@ tarpaulin used in fumigations shall be vinyl coated with a minimum weight of seven (7) ounces per square yard (or having a fumigant retention capability equal to or greater than that provided by the seven-ounce weight tarpaulin). The vinyl coating shall not be worn, cracked, abraded, or similarly damaged to the extent that any of the underlying fabric shows through the vinyl coating.

(c) All cuts, tears, holes, or similar damage to tarpaulins shall be repaired prior to introduction of the fumigant. Temporary repairs to damaged tarpaulins shall be made with vinyl coated self-adhesive tape, or the damaged area of the tarpaulin may be rolled and clipped so the tarpaulin=s fumigant gas retention capability is maintained.

(d) Fumigators shall use the fumigant retention method specified in the table below for the application rate and poundage combinations utilized in the fumigation:

Methyl Bromide Application Rate Per 1,000 Cubic Feet of Structure	**Total Pounds of Methyl Bromide Applied in a 24-hour Period**	**Fumigant Retention Method**
Up to 0.5 pounds	Not more than 20 pounds ---------- More than 20 pounds, but less than 1,000 pounds	Aacceptable@ tarpaulin[1] ---------- Aacceptable@ tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape
More than 0.5 pounds Up to 1.5 pounds	Not more than 50 pounds ---------- More than 50 pounds, but less than 1,000 pounds	Aacceptable@ tarpaulin and a side drape of either: (1) an Aacceptable@ tarpaulin or (2) an unused 4-mil disposable polyethylene sheet [2] ---------- Aacceptable@ tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape
More than 1.5 pounds Up to 3.0 pounds	Not more than 50 pounds ---------- More than 50 pounds, but less than 1,000 pounds	Aacceptable@ tarpaulin and a side drape of one unused 4-mil disposable polyethylene sheet [2] ---------- Aacceptable@ tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape

(e) When tarpaulins are used, all sides of the structure shall be draped to the ground. Sand snakes, water snakes, or similar weights shall be used to seal the base of the tarpaulins to the ground. Prior to the placement of these snakes or weights, the soil adjacent to the structure foundation shall be thoroughly watered.

(f) Chloropicrin shall be used as a warning agent when fumigating a structure unless specifically prohibited by regulations or product labeling.

(g) A fan shall be used to disperse chloropicrin and methyl bromide within the structure. Chloropicrin shall be released into the airstream of the fan when it is introduced (either by itself or in combination with methyl bromide).

(h) Aeration of the fumigated structure shall not begin earlier than one hour after sunrise or later than one hour before sunset. The sunrise and sunset times published in the local newspaper shall be used to establish aeration timing.

(i) Following treatment, the fumigated structure shall be aerated through convection tubing or ducting. Except as provided in subsection (j), the convection tubing or ducting outlet shall be located above the highest point of the roof as follows:

(1) Six (6) feet for fumigations utilizing 50 pounds of methyl bromide or less; or
(2) Ten (10) feet for fumigations utilizing more than 50 pounds of methyl bromide.

(j) If any nearby structure is taller than the fumigated structure and the distance between the structures is equal to or less than the distance indicated in the following table, the convection tubing or ducting outlet shall be located as high as the top of the roof of the tallest structure.

Total Pounds of Methyl Bromide Applied	Convective Tubing or Ducting Outlet Must Be As High As the Tallest Structure Within:
1 - 14	50 ft.
15 - 24	75 ft.
25 - 32	100 ft.
33 - 40	125 ft.
41 - 50	150 ft.
51 - 60	175 ft.
61 - 99	200 ft.
100 - 1,000	A distance in footage equal to 2 times the pounds of methyl bromide used

(k) When aerating a fumigated structure**,** a licensed Branch 1 operator or field representative shall ensure, from the initiation of the aeration procedure to completion of the steps described in (n) of this section, that persons not involved in the aeration process do not come within:

(1) Ten (10) feet of the fumigated structure, for fumigations utilizing 50 pounds of methyl bromide or less; or

(2) For fumigations utilizing more than 50 pounds but less than 80 pounds, a distance in feet calculated using the following formula must exist:

Five (5) times the total poundage of methyl bromide minus 240 feet; or

(3) The number of feet equaling two (2) times the pounds of methyl bromide used for fumigations utilizing more than 80 pounds.

(l) Exhaust fans and convection tubing or ducting may be installed prior to aeration or when covering the structure with tarpaulins in preparation for fumigation. The exhaust fans, convection tubing, and installation of the fans and tubing shall meet the following requirements:

(1) Each exhaust fan shall have a capacity of at least 5,000 cubic feet per minute (cfm).

(2) Convection tubing or ducting shall be large enough to fit over the exhaust fan housing and shall be securely attached to the housing prior to aeration.

(3) Exhaust fans and convection tubing shall be installed in a manner which does not present a hazard to workers and the public.

(m) If exhaust fans and convection tubing or ducting are installed after the fumigation has begun, the installer shall wear self-contained breathing apparatus (SCBA) respiratory protection.

(n) The methyl bromide concentration shall be measured at the approximate center of the structure with a **A**Fumiscope**7**, or similar instrument, that shall be located outside of the fumigated structure. (An instrument similar to a Fumiscope**7** may be used provided it can measure methyl bromide concentrations at the one ounce per 1,000 cubic feet [250 ppm] level.) Without entering the structure, the fumigator shall collect the methyl bromide sample for measurement through the use of tubing or ducting placed inside the structure and connected to the analytical instrument prior to the initiation of fumigation. The structure shall be aerated until the methyl bromide concentration has been reduced to 250 ppm or less (250 ppm is about one ounce per thousand cubic feet) while following the requirements listed below:

(1) If the fumigated structure's windows were left open during the fumigation, the structure shall be aerated through convection tubing or ducting until the methyl bromide concentration is 250 ppm or less with the tarpaulins left in place; or

(2) If the fumigated structure's windows were closed during the fumigation:

(A) The space between the fumigated structure and the tarpaulin shall be aerated prior to tarpaulin removal through convection tubing or ducting.

(B) After the tarpaulins are removed, the fumigated structure shall be aerated through convection tubing or ducting until the methyl bromide concentration is 250 ppm or less.

Note: Authority cited: Sections 11456, 12976, 12981, 14005, and 14102, Food and Agricultural Code.
Reference: Sections 11501, 12981, 14006, and 14102, Food and Agricultural Code.
(Approved 8/15/00; Effective 9/14/00)

Methyl Bromide – Structural Fumigations

Regulation Changes

Question: Is there a document that compares the old regulations with the new regulations?

Answer: A comparison is not useful because existing requirements were moved and new regulations added. Here is a summary of the *key* provisions:

- A "buffer zone" is required during treatment and aeration.
- The method of tarping depends upon the application rate and the total amount of methyl bromide.
- Aeration must be started during daylight hours.
- The top of the convection tubing used to aerate the structure must be located either six (6) or 10 feet above the roof, depending on the amount of methyl bromide.
- The top of the convection tubing must be higher than surrounding structures.
- Interior concentration must be measured with a Fumiscope®; aeration continues until there is a reading of 1 oz./1,000 cubic feet or less.

Fumigator

Question: What are some of the responsibilities of the fumigator prior to fumigating a structure with methyl bromide?

Answer: The fumigator shall ensure that the distance between the fumigated structure and its property line meet the criteria below. No person, other than the fumigation crew, shall enter the area below during the treatment period.

1. For fumigations utilizing 50 pounds of methyl bromide or less, a distance of at least five feet must exist; or

2. For fumigations utilizing more than 50 pounds of methyl bromide, but less than 80 pounds, a distance in feet using the following formula must exist:
    - Five times the total poundage of methyl bromide minus 240 feet; or

3. For fumigations utilizing 80 pounds or more, a distance in feet equal to two times the total poundage of methyl bromide applied must exist.

Question: What procedures should the fumigator take to measure methyl bromide?

Answer: The methyl bromide concentration shall be measured:

1. At the approximate center of the structure with a "Fumiscope®", or similar instrument, that shall be located outside of the fumigated structure. (An instrument similar to a Fumiscope® may be used provided it can measure methyl bromide concentrations at the one ounce per 1,000 cubic feet [250 ppm] level).

2. Without entering the structure, the fumigator shall collect the methyl bromide sample for measurement through the use of tubing or ducting placed inside the structure and connected to the analytical instrument prior to the initiation of fumigation.

Tarpaulins

Question: What is the acceptable tarpulin used in fumigation?

Answer: The acceptable tarpaulin used in fumigations shall be:

1. Vinyl coated with a minimum weight of seven (7) ounces per square yard (or having a fumigant retention capability equal to or greater than that provided by the seven-ounce weight tarpaulin).

2. The vinyl coating shall not be worn, cracked, abraded, or similarly damaged to the extent that any of the underlying fabric shows through the vinyl coating.

3. All cuts, tears, holes, or similar damage to tarpaulins shall be repaired prior to introduction of the fumigant.

4. Temporary repairs to damaged tarpaulins shall be made with vinyl coated self-adhesive tape, or the damaged area of the tarpaulin may be rolled and clipped so the tarpaulin's fumigant gas retention capability is maintained.

Question: When tarpaulins are used, all sides of the structure shall be draped. What is a "drape"? What is used to seal the base of the tarpaulins?

Answer: A drape is the second tarpaulin placed from the structure's eaves to the ground. Weights such as sand snakes, water snakes, or similar weights shall be used to seal the base of the tarpaulins to the ground. Prior to the placement of these snakes or weights, the soil adjacent to the structure foundation shall be thoroughly watered.

Application

Question: How do I determine which retention method to use during the fumigation?

Answer: The fumigation retention method used is related to the amount of methyl bromide used and is determined by the chart in 3 CCR section 6454(d).

Methyl Bromide Application Rate Per 1,000 Cubic Feet of Structure	**Total Pounds of Methyl Bromide Applied in a 24-hour Period**	**Fumigant Retention Method**
Up to 0.5 pounds	Not more than 20 pounds	" Acceptable" tarpaulin
	More than 20 pounds, but less than 1,000 pounds	" Acceptable" tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape
More than 0.5 pounds Up to 1.5 pounds	Not more than 50 pounds	" Acceptable" tarpaulin and a side drape of either (1) an "acceptable" tarpaulin or (2) an unused 4-mil disposable polyethylene sheet.
	More than 50 pounds, but less than 1,000 pounds	" Acceptable" tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape
More than 1.5 pounds Up to 3.0 pounds	Not more than 50 pounds	" Acceptable" tarpaulin and a side drape of one unused 4-mil disposable polyethylene sheet
	More than 50 pounds, but less than 1,000 pounds	" Acceptable" tarpaulin, or if the structure is a concrete tilt-up, seal with vinyl coated self-adhesive tape

Question: What product uses the tarping method for 0.5 lbs/1,000 cubic feet of structure?

Answer: The tarping method for 0.5 lbs/1,000 cubic feet is the most common for products containing methyl bromide and carbon dioxide, such as MAKR. However, other products may also use this application rate. It may also be possible to use a higher application rate when using these types of products, so the tarping method for 0.5 pounds may not be appropriate for all applications.

Convection Tubing or Ducting

Question: If any nearby structure is taller than the fumigated structure and the distance between the structures is equal to or less than the distance indicated in the table below, the convection tubing or ducting outlet shall be located as high as the top of the roof of the tallest nearby structure. For example, if between 41-50 pounds of methyl bromide is applied, convective tubing or ducting outlet must be as high as the tallest structure within how many feet?

Answer: 150 feet

Total Pounds of Methyl Bromide Applied	Convective Tubing or Ducting Outlet Must Be As High As the Tallest Structure Within:
1-14	50 ft.
15-24	75 ft.
25-32	100 ft.
33-40	125 ft.
41-50	150 ft.
51-60	175 ft.
61-99	200 ft
100-1,000	A distance in footage equal to 2 times the pounds of methyl bromide used.

In addition to meeting the requirements of the table above, the outlet (top) of the convection tubing should be either:

1. Six (6) feet above the top of the roof of the actual structure being fumigated, for fumigations utilizing 50 pounds of methyl bromide or less; or

2. 10 feet above the top of the roof of the actual structure being fumigated, for fumigations utilizing more than 50 pounds of methyl bromide.

To summarize, the top of the tube must be the taller of either criteria, one based on the nearby building, and the other based on the structure being fumigated.

Question: What are the requirements for exhaust fans and convection tubing or ducting, and their installation?

Answer: The requirements for the exhaust fans and convection tubing or ducting, and their installation are:

1. Each exhaust fan shall have a capacity of at least 5,000 cubic feet per minute (cfm).

2. Convection tubing or ducting shall be large enough to fit over the exhaust fan housing and shall be securely attached to the housing prior to aeration.

3. Exhaust fans and convection tubing shall be installed in a manner, which does not present a hazard to workers and the public.

Aeration

Question: When can aeration of the fumigated structure begin?

Answer: Aeration of the fumigated structure shall not begin earlier than one hour after sunrise or later than one hour before sunset. Sunrise and sunset times published in a local newspaper shall be used. The tarp must remain in place for the length of time specified by the label.

Question: Exhaust fans and convection tubing or ducting may be installed when preparing to cover the structure with tarpaulins prior to fumigation or *prior to aeration*. What equipment shall the installer wear *prior to aeration*?

Answer: If exhaust fans and convection tubing or ducting are installed *after* fumigation has begun, the installer shall wear self-contained breathing apparatus (SCBA) respiratory protection.

Question: What requirements must be followed when a structure is being aerated?

Answer: When a structure is being aerated, the requirements are as follows:

1. If the fumigated structure's windows were left open during the fumigation, the structure shall be aerated through convection tubing or ducting until the methyl bromide concentration is 250 ppm or less with the tarpaulins left in place; or

2. If the fumigated structure's windows were closed during the fumigation:

    A. The space between the fumigated structure and the tarpaulin shall be aerated prior to tarpaulin removal through convection tubing or ducting.

After the tarpaulins are removed, the fumigated structure shall be aerated through convection tubing or ducting until the methyl bromide concentration is 250 ppm or less.

Question: How long must the structure be aerated?

Answer: The structure shall be aerated until the methyl bromide concentration has been reduced to 250 ppm or less (250 ppm is about one ounce per thousand cubic feet).