

**RECOMMENDED PERMIT CONDITIONS**

**Sulfuryl Fluoride  
Commodity Fumigation**

**TABLE OF CONTENTS**

	Page
SULFURYL FLUORIDE PERMIT CONDITIONS -- DECISION TABLE.....	C-81
RECOMMENDED PERMIT CONDITIONS NON-RESIDENTIAL FACILITIES (<4500 LBS)	
Specific Conditions.....	C-82
RECOMMENDED PERMIT CONDITIONS FOR COMMODITY FUMIGATIONS & NON-RESIDENTIAL FACILITIES (>4500 LBS)	
General Conditions .....	C-83
Specific Conditions.....	C-87
Charts and Tables.....	C-94
FINAL PERMIT CONDITIONS.....	C-99

**RECOMMENDED PERMIT CONDITIONS**

**Sulfuryl Fluoride**

**Commodity Fumigation**

**PERMIT CONDITIONS  
DECISION TABLE**

**SULFURYL FLUORIDE PERMIT CONDITIONS --  
DECISION TABLE**

<b>If the fumigation type is:</b>	<b>And the total amount used will be:</b>	<b>Your permit conditions start on:</b>
Non-Residential Processing & Storage Facilities	<b>&lt; 4500 lbs</b>	Page C-82
Non-Residential Processing & Storage Facilities	<b>&gt; 4500 lbs</b>	The CAC will refer your information to DPR. DPR will prepare a custom site plan for your fumigation.
Commodity	<b>Any amount</b>	Page C-30

## RECOMMENDED PERMIT CONDITIONS

Sulfuryl Fluoride

NON-RESIDENTIAL  
FUMIGATIONS <4500 LBS

Fumigation

### Sulfuryl Fluoride Permit Conditions for Non-Residential (Enclosed Areas), Less than or equal to 4500 lbs

- 1) **General Requirement for Use of ProFume®:** Restricted material permits for the use of ProFume® shall not be issued to a facility operator and/or pest control operator who has not received a Dow AgroSciences certification showing they have attended a ProFume® stewardship training meeting.
- 2) **Restricted Material Permit Conditions for Sulfuryl Fluoride Use in Nonresidential Facilities (Enclosed areas)**
  - a) For fumigations where **less than or equal to 4500 lbs** of sulfuryl fluoride will be applied within a 24 hour period, the following permit conditions apply:
    - i) **Buffer zone requirements:**
      - (1) **Duration:** A buffer zone must be maintained during fumigation and through the completion of aeration.
      - (2) **Distance:** Use Table 1 to determine buffer zone distance based on the target fumigation concentration that will be maintained (oz SF/1000 ft<sup>3</sup>).
      - (3) **Occupation:** The buffer zone extends from the edge of the fumigated building. There may not be any occupied structures within the buffer zone. Only persons supervising and performing fumigation activities are permitted in the buffer zone. Exception: Transit along public thoroughfares is allowed.
    - ii) **Aeration Requirements:**
      - (1) Minimum fumigant release height above ground level: 50 feet.
      - (2) Aeration must be initiated during daylight hours:
        - (a) Not later than one hour prior to sunset, and
        - (b) Not earlier than one hour following sunrise.

**Table 1** – Use table to determine the buffer zone distance from edge of the fumigation facility to the nearest occupied structure.

<i>Targeted Fumigation Conc. (oz/1000ft<sup>3</sup>)</i>	<i>Buffer Zone Distance (ft)</i>
16	30
32	60
48	100
64	140
80	180
96	220
112	260
128	300

**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****GENERAL CONDITIONS**Sulfuryl Fluoride Limits  
Special Site Requirements**1: Maximum  
Application Rate**

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

**2: Total Sulfuryl  
Fluoride**

The total amount of sulfuryl fluoride per work site must not exceed 1000 pounds in a 24-hour period.

**3: Other Types of  
Applications**

This permit condition does not apply to sulfuryl fluoride applications.

**4: Enclosed Area  
and Common  
Walls**

The following types of fumigations are prohibited unless mitigation options are identified in the Work Site Plan:

- those inside an enclosed area with people present
- enclosures which share a common wall with another enclosed area with people present

*Examples: A tarpaulin fumigation inside a warehouse is prohibited. Using a chamber which shares a common wall with an office is prohibited.*

**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****GENERAL CONDITIONS****Fumigation Equipment and  
Introduction****5: Outside  
Introduction**

Application from outside the enclosure through a closed system is required. Releasing fumigant from inside the enclosure is prohibited unless mitigation options are identified in the Work Site Plan.

**6: Gas-tight  
Fumigant Lines**

All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment.

*Examples: When changing sulfuryl fluoride cylinders, the connection between the introduction line and the cylinder must be checked for leaks. The cylinder valve must be checked for leaks after opening.*

**7: Test Equipment  
Seals**

The enclosure must be sealed where instrument sampling lines pass through enclosure walls.

*Example: Fumiscope leads must be placed and the hole at the chamber or enclosure wall sealed prior to the fumigation.*

**8: Test Equipment  
Exhaust**

Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure.

**9: Fumigant Line  
Purge**

When introducing fumigant from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

**10: Control Room  
Ventilation**

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

**11: Control Room  
Storage**

Sulfuryl fluoride cylinders must not be stored inside enclosed control rooms.

## RECOMMENDED PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

<b>GENERAL CONDITIONS</b> Aeration Requirements
--

NOTE: The following conditions pertain to aeration of the fumigation enclosure, not aeration of areas where commodities are stored, except when they are the same.

### 12: Aeration Initiation

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA). Exception: enclosures for which aeration is initiated remotely, such as chambers.

*Examples requiring SCBA: breaking seals on tarpaulin fumigations, opening sea/land container doors*

### 13: Aeration During Daylight

Aeration must be initiated during daylight hours<sup>1</sup>. Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

### 14: Minimum Aeration Times

Enclosures must be aerated for the following minimum duration:

- Four hours if mechanically ventilated using fans, or
- 12 hours if passively ventilated

**Note:** The duration of the aeration period should not be confused with the time the aeration zone is in place. The aeration zone is in place for only the first portion of the aeration: four hours at most.

### 15: Testing Aeration Completeness

The concentration of sulfuryl fluoride in the air spaces between the stacked commodity must be less than 1 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

---

<sup>1</sup> Daylight hours = Not later than one hour prior to sunset and not earlier than one hour following sunrise.

**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****GENERAL CONDITIONS**Storage Requirements  
Documentation Requirements**16: Enclosed  
Storage Areas**

Sulfuryl fluoride concentrations in enclosed areas (i.e., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 1 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.

**Note:** This condition pertains to areas where commodities are stored, not the fumigation enclosure, except when they are the same.

**17: Work Site Plan**

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit. A completed Work Site Plan must be submitted to the CAC for evaluation before a Restricted Materials Permit will be issued.

**18: Test Results  
Documentation**

The enclosure operator must keep records of all test results for two years and make them available to the CAC and workers (pursuant to Labor Code section 6408 and Cal-OSHA regulations Title 8, section 3204) upon request.

## RECOMMENDED PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

SPECIFIC CONDITIONS  
Overview

### Fumigation Enclosure Types

There are specific conditions for each of six different types of fumigation enclosures. The enclosures are classified by the combination of two factors: the amount of fumigant the enclosure retains and the method used to aerate. There are two retention categories: pressure tested and retention tested/untested; and three aeration methods: standard height stack, minimum stack, and no stack. These two retention categories and three aeration categories give the six possible combinations of fumigation enclosures listed below:

A1 - Pressure Tested/Standard Height Stack (e.g., quarantine or vacuum chamber)

A2 - Pressure Tested/Minimum Stack (e.g., quarantine or vacuum chamber)

A3 - Pressure Tested/No Stack (e.g., quarantine chamber without a stack)

B1 - Retention Tested or Untested/Standard Height Stack (e.g., typical chamber)

B2 - Retention Tested or Untested/Minimum Stack (e.g., "Butler" with short stack)

B3 - Retention Tested or Untested/No Stack (e.g., tarp fumigation)

### Buffer Zones

The amount of time a person spends in areas around commodity fumigations must be limited in order to minimize exposure. Exposure is limited by restricting a person's access to or time spent in areas near enclosures being fumigated or aerated. The size of the buffer zones depends on which of the six types of enclosures is being used. For certain types of enclosures, the amount of sulfuryl fluoride used and retained in the enclosure also influences the size of the buffer zone. There are two types of buffer zones: treatment zone and aeration zone. There can be different sizes of treatment zones because of differences in exposure duration. For example, nearby workers would have a smaller treatment zone if they worked for 12 hours, compared to nearby residents who would have a treatment zone based on a 24-hour exposure. A summary of the treatment zones and aeration zones for the various types of fumigations appears in Chart 1.



**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****SPECIFIC CONDITIONS**A1-Pressure Tested/  
Standard Height Stack**Enclosure  
Description**

A pressure tested/standard height enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

*Examples: a quarantine chamber with a tall stack; a vacuum chamber with a tall stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration  
During Daylight**

Does not apply. Aeration may occur at any time.

**RECOMMENDED PERMIT CONDITIONS**

Sulfuryl Fluoride  
Commodity Fumigation

**SPECIFIC CONDITIONS**

A2-Pressure Tested/  
Minimum Stack

**Enclosure  
Description**

A pressure tested/minimum stack enclosure is a vacuum chamber or has passed the USDA pressure test. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.

*Examples: a quarantine chamber with a short stack; a vacuum chamber with a short stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 3, page C-97, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration  
During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****SPECIFIC CONDITIONS**A3-Pressure Tested/  
No Stack**Enclosure  
Description**

A pressure tested/no stack enclosure is a vacuum chamber or has passed the USDA pressure test, and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.

*Example: a quarantine chamber with no stack.*

**19: Treatment Zone**

A treatment zone of 10 feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

**20: Aeration Zone**

An aeration zone as specified in Table 4, page C-98, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

Does not apply.

**22: Aeration  
During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

**RECOMMENDED PERMIT CONDITIONS**Sulfuryl Fluoride  
Commodity Fumigation**SPECIFIC CONDITIONS**B1-Retention Tested or Untested/  
Standard Height Stack**Enclosure  
Description**

A retention tested or untested/standard height stack enclosure may retain a large or small proportion of the Sulfuryl Fluoride and the exhaust stack is at least 10 feet above the enclosure's highest point, at least 10 feet above any building within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

**Note:** The size of the treatment zone may be minimized by measuring how well the enclosure fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical chamber with a tall stack, a "Butler" tank with a tall stack, a building with a tall stack.*

**19: Treatment Zone**

A treatment zone as specified in Table 2, page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

**20: Aeration Zone**

An aeration zone of 10 feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration  
During Daylight**

Does not apply. Aeration may occur at any time.

**RECOMMENDED PERMIT CONDITIONS****Sulfuryl Fluoride  
Commodity Fumigation****SPECIFIC CONDITIONS**B2-Retention Tested or Untested/  
Minimum Stack**Enclosure  
Description**

A retention tested or untested/minimum stack enclosure may retain a large or small proportion of the fumigant. The exhaust stack is at least 15 feet above ground and the exhaust exit velocity is at least 600 feet per minute.

**Note:** The size of the treatment zone may be minimized by measuring how well the enclosure retains fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a chamber with a short stack, a building exhausted through the roof.*

**19: Treatment Zone**

A treatment zone as specified in [Table 2](#), page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

**20: Aeration Zone**

An aeration zone as specified in [Table 3](#), page C-97, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

**22: Aeration  
During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

**RECOMMENDED PERMIT CONDITIONS**Sulfuryl Fluoride  
Commodity Fumigation**SPECIFIC CONDITIONS**B3-Retention Tested or Untested/  
No Stack**Enclosure  
Description**

A retention tested or untested/no stack enclosure may retain a large or small proportion of the fumigant and either has no stack or the exhaust stack is less than 15 feet above ground or the exhaust exit velocity is less than 600 feet per minute.

**Note:** The size of the buffer zones may be minimized by measuring how well the enclosure retains fumigant and determining its loss ratio. This is done by performing a DPR-approved test procedure.

*Examples: a typical sea/land container, a building exhausted through open doors and windows, a typical tarpaulin fumigation.*

**19: Treatment Zone**

A treatment zone as specified in Table 2, page C-96, must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. Exception: Limited transit is allowed if unavoidable.

Different size zones may be calculated based on the duration of exposure and/or duration of the treatment period. For example, a treatment zone may be calculated for nearby workers based on a 12-hour work shift, and a separate treatment zone may be calculated for nearby residents based on 24-hour occupancy.

**20: Aeration Zone**

An aeration zone as specified in Table 4, page C-98, must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. Exception: Transit along public thoroughfares is allowed. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration of sulfuryl fluoride is less than 1 ppm. The aeration period itself may be of longer duration. Testing must be done according to approved procedures.

**21: Vertical Stack  
Exhaust**

Does not apply.

**22: Aeration  
During Daylight**

Aeration must be initiated during daylight hours (see permit condition 13).

## RECOMMENDED PERMIT CONDITIONS

### Sulfuryl Fluoride Commodity Fumigation

<b>CHART 1</b> Summary of Buffer Zone Sizes
--

Retention Category	Aeration Method	Class	Treatment Zone Size	Aeration Zone Size	Aerate Daylight Hours Only
	Standard Height Stack <i>(Table 1 requirements)*</i>	A1	10 feet	10 feet	NO
Pressure Tested <i>(USDA pressure test)</i>	Minimum Stack <i>(stack 15 ft above ground &amp; exit velocity &gt;600 ft/min)</i>	A2	10 feet	Table 3	YES
	No Stack	A3	10 feet	Table 4	YES
	Standard Height Stack <i>(Table 1 requirements)*</i>	B1	Table 2	10 feet	NO
Retention Tested or Untested <i>(DPR-approved test or no test)</i>	Minimum Stack <i>(stack 15 ft above ground &amp; exit velocity &gt;600 ft/min)</i>	B2	Table 2	Table 3	YES
	No Stack	B3	Table 2	Table 4	YES

\* The stack must be at least 10 feet above the enclosure's highest point and at least 10 feet above any major obstruction within 200 feet of the stack and at least as tall as the appropriate value listed in Table 1.

# RECOMMENDED PERMIT CONDITIONS

## Sulfuryl Fluoride Commodity Fumigation

<b>TABLE 1</b> Standard Height Exhaust Stack
---

This table is used to determine the "standard height" (feet) of a stack. A "standard height" exhaust stack is one which is:

1. at least 10 feet above the enclosure's highest point, and
2. at least 10 feet above any major obstruction within 200 feet of the stack, and
3. at least as tall (above ground level) as the appropriate value in the table below

Total Amount of Sulfuryl Fluoride Applied (pounds) at the Work Site in a 24-hour Period - **ROUND UP**

	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
600	21	23	26	28	30	32	34	37	39	41	43	45	48	50	52	54	57	59	61	63
700	19	21	23	25	28	30	32	34	36	39	41	43	45	47	50	52	54	56	58	61
800	16	18	21	23	25	27	30	32	34	36	38	41	43	45	47	49	52	54	56	58
900	15	16	18	20	23	25	27	29	31	34	36	38	40	43	45	47	49	51	54	56
1000	15	15	16	18	20	22	25	27	29	31	33	36	38	40	42	45	47	49	51	53
Exit Velocity (feet per minute)*																				
1100	15	15	15	16	18	20	22	24	27	29	31	33	35	38	40	42	44	46	49	51
1200	15	15	15	15	15	18	20	22	24	26	29	31	33	35	37	40	42	44	46	48
1300	15	15	15	15	15	15	17	19	22	24	26	28	31	33	35	37	39	42	44	46
1400	15	15	15	15	15	15	15	17	19	21	24	26	28	30	32	35	37	39	41	44
1500	15	15	15	15	15	15	15	15	17	19	21	23	26	28	30	32	34	37	39	41
<b>ROUND DOWN</b>																				
1600	15	15	15	15	15	15	15	15	15	17	19	21	23	25	28	30	32	34	36	39
1700	15	15	15	15	15	15	15	15	15	15	16	19	21	23	25	27	30	32	34	36
1800	15	15	15	15	15	15	15	15	15	15	15	16	18	20	23	25	27	29	32	34
1900	15	15	15	15	15	15	15	15	15	15	15	15	16	18	20	22	25	27	29	31
2000	15	15	15	15	15	15	15	15	15	15	15	15	15	16	18	20	22	24	27	29
2100	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	18	20	22	24	26
2200	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	17	20	22	24
2300	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	17	19	21
2400	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	17	19
2500	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	17

Rated Fan Capacity (cubic feet per minute)

\*Exit Velocity =

Stack Cross-Sectional Area (square feet)

area of circle =  $3.14 \times \text{radius}^2$



**RECOMMENDED PERMIT CONDITIONS**  
**Sulfuryl Fluoride**  
**Commodity Fumigation**

**TABLE 2**  
**Treatment Zone Sizes for**  
**Retention Tested and Untested Enclosures**

This table is used to determine the treatment zone size (feet) surrounding enclosures which are retention tested or untested. Consult with the CAC to determine the sizes for multiple fumigations in a 24-hour period.

		Concentration Lost (pounds per 1000 cubic feet)* <b>ROUND UP</b>														
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
	1000	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	2000	30	30	30	30	30	30	30	30	30	35	40	45	50	55	60
	3000	30	30	30	30	30	30	35	40	50	55	60	65	70	75	80
	4000	30	30	30	30	30	40	50	55	65	70	80	85	90	95	100
	6000	30	30	30	35	50	60	70	80	90	95	105	110	120	125	130
	8000	30	30	30	50	65	80	90	100	110	120	125	135	140	150	155
	10000	30	30	45	65	85	100	115	125	135	145	160	165	175	185	195
	15000	30	30	60	80	100	120	130	145	160	170	180	190	200	210	220
	20000	30	40	70	95	115	135	150	170	180	195	205	220	230	240	250
	25000	30	45	80	105	130	150	170	185	200	215	230	240	255	265	275
	30000	30	55	90	120	145	165	185	205	220	235	250	265	280	290	305
	35000	30	60	100	130	160	180	200	225	240	255	275	290	300	315	330
Volume Fumigated in a 24-hour Period (cubic feet)	40000	30	65	110	145	175	200	220	240	260	280	295	310	325	340	355
	45000	30	75	120	155	185	210	235	260	280	295	315	335	350	365	380
	50000	35	80	130	165	200	230	250	275	300	320	340	355	370	390	405
	60000	40	95	145	185	225	255	285	310	335	355	380	400	420	440	455
	70000	45	105	165	210	250	285	315	345	370	395	420	440	460	485	505
<b>ROUND UP</b>	80000	50	115	180	225	270	305	340	375	400	425	455	480	500	525	545
	90000	55	125	190	240	290	330	365	400	430	455	485	510	535	560	585
	100000	60	135	205	260	310	355	390	430	460	490	525	550	575	605	625
	110000	65	145	220	280	335	380	420	460	490	525	560	585	615	645	670
	120000	70	155	235	295	350	400	440	485	520	555	590	620	650	680	705
130000	75	165	245	310	370	420	465	510	545	580	620	650	680	715	740	
140000	80	175	260	325	390	440	485	535	570	610	650	680	715	745	775	
150000	85	180	270	340	405	460	505	555	595	635	675	710	745	780	810	
170000	90	195	295	370	435	495	545	600	640	685	730	765	800	840	870	
190000	95	210	315	390	465	530	580	640	685	730	775	815	850	895	930	
210000	100	225	330	415	490	560	615	675	725	770	820	860	900	945	980	
230000	105	235	350	435	515	585	645	710	760	810	860	905	945	990	1030	
250000	110	250	365	455	540	615	675	740	795	845	900	945	990	1035	1075	

\* The Concentration Lost is calculated from the application rate, exposure duration, and loss ratio (proportion of fumigant leaked from the enclosure), according to the formula below. The exposure duration for workers is 12 hours or the treatment duration, whichever is less. The exposure duration for residents is the duration of treatment (24 hours maximum). The loss ratio is determined from a DPR approved test; for untested enclosures use **0.030**.

$$\text{Concentration Lost} = [\text{Application Rate (pounds per 1000 cubic feet)}] \times [\text{Exposure Duration (hours)}] \times [\text{Loss Ratio}]$$

# RECOMMENDED PERMIT CONDITIONS

**Sulfuryl Fluoride  
Commodity Fumigation**

**TABLE 3**  
Aeration Zone Sizes for Minimum Stacks

This table is used to determine the aeration zone size (feet) required **during the aeration** of enclosures with exhaust stacks having the following characteristics:

1. The top of the exhaust stack is at least 15 feet above ground level, and
2. The exit velocity is at least 600 feet per minute

$$\text{Exit Velocity} = \frac{\text{Rated Fan Capacity (cubic feet per minute)}}{\text{Stack Cross-Sectional Area (square feet)}}$$

Total Retained in a 24-hour Period (pounds)*	Aeration Zone (feet)
50	10
51	220
<b>ROUND UP</b> 100	220
150	360
200	490
250	610
300	720
350	820
400	920
450	1000
500	1090
550	1170
600	1250
650	1320
700	1390
750	1460
800	1530
850	1600
900	1670
950	1730
1000	1790

\* The Total Retained is calculated from the amount of fumigant, treatment duration and loss ratio (proportion of fumigant leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

Proportion Retained\*\* = 1 – [Treatment Duration (hours) × Loss Ratio]

\*\*For untested enclosures, use **0.90** for the Proportion Retained

Total Retained = [Amount of fumigant Applied in a 24 hour Period (pounds)] × [Proportion Retained]

# RECOMMENDED PERMIT CONDITIONS

## Sulfuryl Fluoride Commodity Fumigation

<b>TABLE 4</b> Aeration Zone Sizes for No Stacks
---

This table is used to determine the aeration zone size (feet) of enclosures that have no stack. Consult with the CAC to determine the aeration zone size when aerating multiple enclosures in a 24-hour period.

		Concentration Retained (pounds per 1000 cubic feet)* <b>ROUND UP</b>														
		0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0
Volume Aerated in a 24-hour Period (cubic feet)	1000	30	30	30	30	30	30	40	50	60	70	75	85	90	95	105
	2000	30	30	30	40	60	75	90	100	115	125	135	145	155	160	170
	3000	30	30	45	70	90	110	125	140	155	165	180	190	200	210	220
	4000	30	30	65	95	115	135	155	170	185	200	215	225	240	250	260
	6000	30	55	100	130	160	180	205	225	240	260	275	290	305	320	335
	8000	35	80	125	165	195	220	245	265	290	305	325	345	360	375	390
	10000	50	105	155	195	225	255	285	310	330	350	375	390	410	430	445
	15000	65	140	200	250	290	330	360	395	420	450	475	500	525	545	565
	20000	80	175	240	300	345	390	425	460	495	525	560	585	615	640	665
	25000	95	200	275	340	390	440	480	520	560	595	630	660	695	725	750
	30000	110	225	305	375	430	485	530	575	615	655	695	730	765	795	830
	35000	125	245	335	410	470	525	575	625	670	710	750	790	830	865	900
	40000	135	265	360	440	505	565	620	670	720	765	810	850	890	930	965
	45000	145	285	385	470	540	600	660	715	765	815	860	905	945	990	1030
	50000	160	305	410	495	570	635	700	755	810	860	910	955	1000	1045	1090
60000	180	340	455	550	630	705	770	835	895	950	1005	1060	1110	1155	1205	
<b>ROUND UP</b>	70000	200	370	495	600	685	765	840	910	975	1035	1095	1150	1205	1260	1315
	80000	220	400	535	645	740	830	905	980	1050	1120	1180	1245	1305	1360	1420
	90000	235	430	575	690	795	885	970	1050	1125	1195	1265	1330	1395	1460	1520
	100000	255	460	615	735	845	945	1035	1120	1200	1275	1350	1420	1485	1555	1620
	110000	270	490	650	780	895	1000	1095	1185	1270	1350	1425	1500	1575	1645	1710
	120000	285	515	685	820	945	1050	1155	1245	1335	1420	1505	1580	1660	1730	1805
	130000	300	545	720	865	990	1105	1210	1310	1400	1490	1575	1660	1740	1820	1895
	140000	315	570	750	905	1035	1155	1265	1370	1465	1560	1650	1735	1820	1900	1980
	150000	330	595	785	945	1080	1205	1320	1425	1530	1625	1720	1810	1895	1980	2065
	170000	360	640	845	1015	1160	1295	1420	1535	1640	1745	1845	1940	2035	2125	2215
190000	385	685	905	1080	1240	1380	1510	1630	1745	1855	1960	2065	2165	2260	2355	
210000	410	725	955	1140	1305	1450	1590	1715	1835	1950	2060	2165	2270	2370	2470	
230000	430	760	995	1190	1360	1515	1655	1785	1910	2030	2140	2250	2355	2460	2560	
250000	450	785	1030	1230	1405	1560	1705	1840	1965	2085	2200	2315	2420	2525	2625	

\* The Concentration Retained is calculated from the rate, treatment duration, and loss ratio (proportion of fumigant leaked from the enclosure), according to the formulas below. The loss ratio is determined from a DPR-approved test.

$$\text{Proportion Retained}^{**} = 1 - [\text{Treatment Duration (hours)} \times \text{Loss Ratio}]$$

\*\*For untested enclosures, use **0.90** for the Proportion Retained

$$\text{Concentration Retained} = [\text{Application Rate (pounds per 1000 cubic feet)}] \times [\text{Proportion Retained}]$$

**FINAL PERMIT CONDITIONS**

**Sulfuryl Fluoride  
Commodity Fumigation**

**GENERAL INFORMATION**

**Fumigation Site:** \_\_\_\_\_ **Permit Number:** \_\_\_\_\_

**Address:** \_\_\_\_\_ **City:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

**Contact Person:** \_\_\_\_\_ **Phone:** \_\_\_\_\_  
(Facility Operator, Grower, QAC, QAL, etc.)

**Pest Control Business:** \_\_\_\_\_ **Permit Number:** \_\_\_\_\_

**Address:** \_\_\_\_\_ **City:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

**Contact Person:** \_\_\_\_\_ **Phone:** \_\_\_\_\_  
(QAL with the appropriate category)

I VERIFY THAT THE ATTACHED PERMIT CONDITIONS WILL BE FOLLOWED

**Permit Applicant:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
(Facility Operator)

# FINAL PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

GENERAL INFORMATION

## 1: Maximum Application Rate

A maximum application rate of 8 pounds per 1000 cubic feet or the rate specified by the label may be used, whichever is less.

Work Site Plan B.1

Complies

Does Not Apply

Alternative: \_\_\_\_\_

*See page C-87 for possible additional restrictions to comply with the buffer zones.*

## 2: Total Sulfuryl Fluoride

The total amount of sulfuryl fluoride per work site must not exceed 1000 pounds in a 24-hour period.

Work Site Plan B.2

Complies

Does Not Apply

Alternative: \_\_\_\_\_

*See page C-87 for possible additional restrictions to comply with the buffer zones.*

## 3: Other Types of Applications

This permit condition does not apply to sulfuryl fluoride fumigations.

Work Site Plan B.3

## 4: Enclosed Area and Common Walls

The following types of fumigations are prohibited:

- those inside an enclosed area with people present

- enclosures which share a common wall with another enclosed area with people present

Work Site Plan B.4 & 5

Complies

Does Not Apply

Alternative: \_\_\_\_\_

# FINAL PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

GENERAL INFORMATION
---------------------

## 5: Outside Introduction

Application from outside the enclosure through a closed system is required. Releasing sulfuryl fluoride from inside the enclosure is prohibited.

Work Site Plan B.6

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## 6: Gas-tight Fumigant Lines

All fumigant lines must be gas-tight. Fumigant lines, valves, fittings, etc. which are routinely adjusted or changed must be checked for leaks after each adjustment.

Work Site Plan B.7

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## 7: Test Equipment Seals

The enclosure must be sealed where instrument sampling lines pass through enclosure walls.

Work Site Plan B.8

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## 8: Test Equipment Exhaust

Exhaust from sampling equipment must be vented away from people and to outside air or back into the enclosure.

Work Site Plan B.9

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

# FINAL PERMIT CONDITIONS

**Sulfuryl Fluoride  
Commodity Fumigation**

<b>GENERAL INFORMATION</b>
----------------------------

## **9: Fumigant Line Purge**

When introducing sulfuryl fluoride from an enclosed control room, applicators must use nitrogen gas or compressed air to purge fumigant lines prior to changing cylinders.

Work Site Plan B.10

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## **10: Control Room Ventilation**

Enclosed control rooms must be mechanically ventilated during fumigation if workers are present.

Work Site Plan B.11

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## **11: Control Room Storage**

Sulfuryl fluoride cylinders must not be stored inside enclosed control rooms.

Work Site Plan B.12

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

# FINAL PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

<b>GENERAL INFORMATION</b>
----------------------------

## 12: Aeration Initiation

Work Site Plan B.13

Persons who initiate aeration by manually breaking a seal must wear a self-contained breathing apparatus (SCBA).

Exception: Enclosures for which aeration is initiated remotely, such as chambers.

Complies

Does Not Apply

Alternative: \_\_\_\_\_

## 13: Aeration During Daylight

Work Site Plan D.3

Aeration must be initiated during daylight hours.

Exception: Enclosures which aerate using an exhaust stack meeting the standard height requirements may exhaust at any time.

Complies

Does Not Apply

Alternative: \_\_\_\_\_

## 14: Minimum Aeration Times

Work Site Plan  
B.14 & B.15

Enclosures must be aerated for the following minimum duration:

a. 4 hours if mechanically ventilated using fans, or

b. 12 hours if passively ventilated

Complies

Does Not Apply

Alternative: \_\_\_\_\_

## 15: Testing Aeration Completeness

Work Site Plan B.16

The concentration of sulfuryl fluoride in the air spaces between the stacked commodity must be less than 1 ppm before the commodity can be moved from the enclosure. Testing of this air space must be done according to approved procedures.

Complies

Does Not Apply

Alternative: \_\_\_\_\_



# FINAL PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

GENERAL INFORMATION
---------------------

## 16: Enclosed Storage Areas

Work Site Plan  
B.17 & B.18

Sulfuryl fluoride concentrations in enclosed areas (i.e., buildings, warehouses, silos, etc.) where fumigated commodities are stored must be less than 1 ppm before persons may enter. Testing of the air concentration must be done according to approved procedures. No individual may be inside the enclosed area for more than one hour in a 24-hour period.

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## 17: Work Site Plan

The enclosure operator and/or pest control business must complete or revise a Work Site Plan before receiving a permit.

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

## 18: Test Results Documentation

Work Site Plan B.19

The enclosure operator must keep records of all test results for 2 years and make them available to the County Agricultural Commissioner and workers upon request.

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_

# FINAL PERMIT CONDITIONS

Sulfuryl Fluoride  
Commodity Fumigation

GENERAL INFORMATION

*This part needs to be completed for each enclosure.*

## Enclosure Identification/Description: \_\_\_\_\_

(check one)

- Work Site Plan C.1 - 11
- A1 - Pressure Tested/Standard Height Stack
  - A2 - Pressure Tested/Minimum Stack
  - A3 - Pressure Tested/No Stack
  - B1 - Retention Tested or Untested/Standard Height Stack
  - B2 - Retention Tested or Untested/Minimum Stack
  - B3 - Retention Tested or Untested/No Stack

## Ancillary Buffer Zone Requirements:

Maximum  
Application Rate: \_\_\_\_\_

Maximum  
Fumigated Volume: \_\_\_\_\_

Treatment  
Duration: \_\_\_\_\_

Other Enclosures  
Which May Be  
Used Within 24 hrs: \_\_\_\_\_

### 19: Treatment Zone

Work Site Plan C.12 - 20

A treatment zone of \_\_\_\_\_ feet must be established around the enclosure during the fumigation treatment period. Only persons supervising and performing fumigation activities are permitted in the treatment zone during the treatment period. A separate treatment zone of \_\_\_\_\_ feet for workers may be used.

### 20: Aeration Zone

Work Site Plan C.12 - 20

An aeration zone of \_\_\_\_\_ feet must be maintained around an enclosure during the first portion of the aeration period. Only persons supervising and performing fumigation activities are permitted in the aeration zone. The aeration zone must remain in place for the first four hours of aeration or until the exhaust concentration is less than 1 ppm.

### 21: Vertical Stack Exhaust

Work Site Plan D.1, D.2

The stack must be vented vertically to the outside air. When exhausting, the top of the stack must be free of overhead obstructions.

- Complies
- Does Not Apply
- Alternative: \_\_\_\_\_