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Determine the Spray Time for 10% d-phenothrin with a labeled application rate of 8 grams per 1000 cu. ft. and nozzle dispersion rate of 5 grams per second

**TABLE 5-5-1: Airbus Industries**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/1,000 ft <sup>3</sup>	Spray Time in Seconds
A300	Cabin	27,100	27.1	8	43.5
	Pit-#1	3,722	3.7	8	6.0
	Pit-#2	1,265	1.3	8	2.0
	Pit-#3	565	.6	8	1.0
A300-600R (passenger) (long-range)	Cabin	?			?
	Forward	1,134	1.1	8	2.0
	Aft	1,134	1.1	8	2.0
	Bulk	400	.4	8	0.5
A300-600 (freighter)	Main	9,950	10.0	8	16.0
	Pit-Fwd	1,900	1.9	8	3.0
	Pit-Aft	2,250	2.2	8	3.5
A300-600 (FEDEX)	Main	19,069	19.1	8	30.5
	Pit-Fwd	2,684	2.7	8	4.5
	Pit-Aft	2,154	2.2	8	3.5
	Pit-Back	742	.7	8	1.0
A300 (convertible)	Main	11,943	11.9	8	19.0
A300B4 (freighter)	Main	9,950	10.0	8	16.0
	Pit-Fwd	1,900	1.9	8	3.0
	Pit-Aft	1,850	1.9	8	3.0
A310 (freighter)	Main	7,950	8.0	8	13.0
	Pit-Fwd	1,260	1.3	8	2.0
	Pit-Aft	1,550	1.6	8	2.5
A310 (FEDEX)	Main	14,650	14.7	8	23.5
	Pit-Fwd	1,942	1.9	8	3.0
	Pit-Aft	1,271	1.3	8	2.0
	Pit-Back	742	.7	8	1.0
A320-200 (passenger)	N/A	982	.9	8	1.5

**TABLE 5-5-2: Antonov**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/1,000 ft <sup>3</sup>	Spray Time in Seconds
AN 124 and 126	N/A	26,485	26.5	8	42.5

**TABLE 5-5-3: ATR**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
ATR 42 (CTO) (Container Transport Option)	Bulk	890	.9	8	1.5
ATR 72 (CTO)	Bulk	1,285	1.3	8	2.0

**TABLE 5-5-4: BAC (British Aircraft Corp)**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
111-200, 300, and 400	Cabin	4,056	4.1	8	6.5
	Pit-Fwd	380	.4	8	0.5
	Pit-Aft	154	.2	8	0.5
111-500	Cabin	5,094	5.1	8	8.0
	Pit-Fwd	451	.5	8	1.0
	Pit-Aft	260	.3	8	0.5
VC 10	Cabin	6,750	6.8	8	11.0
	Pit-Fwd	744	.7	8	1.0
	Pit-Aft	820	.8	8	1.5
Super VC 10	Cabin	7,850	7.9	8	12.5
	Pit-Fwd	744	.7	8	1.0
	Pit-Aft	820	.8	8	1.5

**TABLE 5-5-5: BAC (Aerospatiale)**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Concorde	Cabin	5,100	5.1	8	8.0
	Pit-Fwd	241	.2	8	0.5
	Pit-Aft	468	.5	8	1.0

**TABLE 5-5-6: Boeing**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
707-120, 120B, and 220	Cabin	7,484	7.5	8	12.0
	Pit-Fwd	755	.8	8	1.5
	Pit-Aft	910	.9	8	1.5
	Fl.Deck	451	.5	8	1.0
707-320C	Bulk	7,548	7.5	8	12.0

TABLE 5-5-6: Boeing (continued)

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
707-320, 420	Cabin	8,074	8.0	8	13.0
	Pit-Fwd	870	.9	8	1.5
	Pit-Aft	905	.9	8	1.5
	Fl. Deck	451	.5	8	1.0
720	Cabin	6,860	6.9	8	11.0
	Pit-Fwd	688	.7	8	1.0
	Pit-Aft	690	.7	8	1.0
	Fl. Deck	451	.5	8	1.0
727-100C	Bulk	4,168	4.2	8	7.0
727-100 (passenger)	Cabin	4,560	4.6	8	7.5
	Pit-Fwd	900	.9	8	1.5
	Pit-Aft	425	.4	8	0.5
	Fl. Deck	451	.5	8	1.0
727-200C	Bulk	8,032	8.0	8	13.0
727-200 (passenger)	Cabin	6,561	6.6	8	10.5
	Pit-Fwd	690	.7	8	1.0
	Pit-Aft	760	.8	8	1.5
	Fl. Deck	451	.5	8	1.0
737-100	Cabin	4,636	4.6	8	7.5
	Pit-Fwd	280	.3	8	0.5
	Pit-Aft	406	.4	8	0.5
737-200 (passenger)	Cabin	4,636	4.6	8	7.5
	Pit-Fwd	370	.4	8	0.5
	Pit-Aft	505	.5	8	1.0
737-200C	Bulk	3,602	3.6	8	6.0
737-300	Cabin	5,600	5.6	8	8.0
	Pit-Fwd	600	.6	8	1.0
	Pit-Aft	770	.8	8	1.0
	Fl. Deck	225	.2	8	0.5
737-400	Cabin	4,900	4.9	8	9.0
	Pit-Fwd	425	0.4	8	1.0
	Pit-Aft	650	0.7	8	1.5
	Fl. Deck	225	0.3	8	0.5
737-500	Cabin	4,340	4.3	8	7.0
	Pit-Fwd	290	.3	8	0.5
	Pit-Aft	535	.5	8	1.0
	Fl. Deck	255	.3	8	0.5
747 Combi	—	6,886	6.9	8	11.0
747F	—	22,952	23.0	8	37.0
747-100, 200	Cabin	27,650	27.7	8	44.5
	Pit-Fwd	3,485	3.5	8	6.0
	Pit-Aft	3,015	3.0	8	5.0
	Fl. Deck	920	.9	8	1.5
	U. Deck	1,370	1.4	8	2.0
	Belly	1,000	1.0	8	1.5

TABLE 5-5-6: Boeing (continued)

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
747-300,400	Cabin	27,650	27.7	8	44.5
	Pit-Fwd	3,485	3.5	8	5.5
	Pit-Aft	3,015	3.0	8	5.0
	Fl. Deck	920	.9	8	1.5
	U. Deck	2,800	2.8	8	4.5
	Belly	1,000	1.0	8	1.5
757-200 (passenger)	Pit-Fwd	652	.6	8	1.0
	Pit-Aft	1,086	1.1	8	2.0
757-200PF	Bulk	8,405	8.4	8	13.5
767-200	Main	14,255	14.3	8	23.0
	Pit-Fwd	1,470	1.5	8	2.5
	Pit-Aft	1,470	1.5	8	2.5
767-300 (passenger)	Cabin	10,497	10.5	8	17.0
	Pit-Fwd	1,920	1.9	8	3.0
	Pit-Aft	1,680	1.7	8	2.5
	Aft+Bulk	430	.4	8	0.5
777-200	Cabin	20,700	20.7	8	33.0
	Pit-Fwd	280	.3	8	0.5
	Pit-Aft	4,630	4.6	8	7.5
	Aft+Bulk	4,220	4.2	8	6.5

TABLE 5-5-7: Canadair

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
CL-44	Bulk	6,235	6.2	8	10.0
CL-440	Bulk	13,798	13.8	8	22.0

TABLE 5-5-8: Casa

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
C-212	N/A	777	.8	8	1.5
ATR 72 (CTO)	N/A	1,528	1.5	8	2.5

TABLE 5-5-9: Cessna

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Caravan	N/A	452	.5	8	1.0

**TABLE 5-5-10: Convair**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
240	Cabin	1,650	1.7	8	2.5
	Pit-Fwd	193	.2	8	0.5
	Belly	88	.1	8	... <sup>1</sup>
340 & 44-	Cabin	1,816	1.8	8	3.0
	Pit-Fwd	158	.2	8	0.5
	Pit-Aft	193	.2	8	0.5
	Belly	78	.1	8	... <sup>1</sup>
880 & 800M	Cabin	5,802	5.8	8	9.5
	Pit-Fwd	415	.4	8	0.5
	Pit-Aft	488	.5	8	1.0
990	Cabin	6,336	6.3	8	10.0
	Pit-Fwd	488	.5	8	1.0
	Pit-Aft	497	.5	8	1.0

1 In these small volume spaces, use the extender and calculate the application time using a rate of 2.5 grams per second. At a rate of 2.5 grams per second, the following table will give the spray time:

<u>1,000 ft<sup>3</sup> Units</u>	<u>Spray Time in Seconds</u>
0.1	0.5
0.2	0.5
0.3	1.0
0.4	1.5

TABLE 5-5-11: de Havilland

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Dash 7, Series 100 (all cargo)	N/A	240	.2	8	0.5
DHC-6 Twin Otter, Series 300 (cargo version)	Fwd	38	.1	8	... <sup>1</sup>
	Aft	88	.1	8	... <sup>1</sup>
	Bulk	384	.4	8	0.5
Dash 7, Series 100, Combi (50 passengers)	N/A	240	.2	8	0.5
Dash 7, Series 100, Combi (18 passengers)	N/A	240	.2	8	0.5
Dash 8, Series 300, Combi (49 passengers)	N/A	400	.4	8	0.5
Dash 8, Series 100, Combi (37 passengers)	N/A	300	.3	8	0.5
Dash 8, Series 100, Combi (20 passengers)	N/A	775	.8	8	1.5

1 In these small volume spaces, use the extender and calculate the application time using a rate of 2.5 grams per second. At a rate of 2.5 grams per second, the following table will give the spray time:

1,000 ft <sup>3</sup> Units	Spray Time in Seconds
0.1	0.5
0.2	0.5
0.3	1.0
0.4	1.5

TABLE 5-5-12: Dornier

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
228-212	N/A	642	.6	8	1.0

**TABLE 5-5-13: Embraer**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
EMB-120 Brasilia	N/A	1,193	1.2	8	2.0
EMB-110 Brasilia	N/A	523	.5	8	1.0

**TABLE 5-5-14: Fairchild**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Expediter	NA	580	.6	8	1.0
Metro II & IIA	NA	580	.6	8	1.0
F27	Cabin	2,900	2.9	8	4.5
	Pit	192	.2	8	0.5
FH11227	Cabin	3,200	3.2	8	5.0
	Pit	192	.2	8	0.5

**TABLE 5-5-15: Fokker**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
F27	N/A	198	.2	8	0.5
F28	N/A	290	.3	8	0.5
F100C	Bulk	2,070	2.0	8	3.0

**TABLE 5-5-16: Lockheed**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Electra	Cabin	5,160	5.2	8	8.5
	Pit-Fwd	254	.3	8	0.5
	Pit-Aft	274	.3	8	0.5
L1011 (100) (200) (250)	Cabin	23,100	23.1	8	37.0
	Pit-Fwd	1,600	1.6	8	2.5
	Pit-Ctr	1,600	1.6	8	2.5
	Pit-Aft	700	.7	8	1.0
	Galley	1,380	1.4	8	2.0
L-1011-1	Cargo Holds	3,900	3.9	8	6.0
L-100-30	N/A	6,057	6.1	8	10.0

TABLE 5-5-17: McDonnell-Douglas

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
DC-3	Bulk	1,300	1.3	8	2.0
DC-6 (cargo)	Bulk	3,354	3.4	8	5.5
DC-6 (passengers)	Cabin	4,332	1.3	8	7.0
	Pit-Fwd	200	.2	8	0.5
	Pit-Aft	173	.2	8	0.5
DC-6A	Cabin	4,375	4.4	8	7.0
	Pit-Fwd	267	.3	8	0.5
	Pit-Aft	300	.3	8	0.5
DC-6B	Cabin	4,375	4.4	8	7.0
	Pit-Fwd	276	.3	8	0.5
	Pit-Aft	242	.2	8	0.5
DC-7B	Cabin	4,612	4.6	8	7.0
	Pit-Fwd	267	.3	8	0.5
	Pit-Aft	364	.4	8	0.5
DC-7C	Cabin	4,778	4.8	8	7.5
	Pit-Fwd	312	.3	8	0.5
	Pit-Aft	339	.3	8	0.5
DC-8-50	Cabin	12,911	12.9	8	20.5
	Pit-Fwd	690	.7	8	1.0
	Pit-Aft	700	.7	8	1.0
DC-8-54F	Main	5,984	6.0	8	9.5
	Pit-Fwd	690	.7	8	1.0
	Pit-Aft	700	.7	8	1.0
DC-8-55F	Main	5,878	5.9	8	9.5
	Pit-Fwd	690	.7	8	1.0
	Pit-Aft	700	.7	8	1.0
DC-8-61 & 63	Cabin	15,955	16.0	8	25.5
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,210	1.2	8	2.0
DC-8-62	Cabin	13,739	13.7	8	22.0
	Pit-Fwd	799	.8	8	1.5
	Pit-Aft	816	.8	8	1.5
DC-8-62CF	Main	6,442	6.4	8	10.0
	Pit-Fwd	800	.8	8	1.5
	Pit-Aft	815	.8	8	1.5
DC-8-63F and DC-8-73F	Main	10,350	10.4	8	16.5
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,210	1.2	8	2.0
DC-8-71CF	Main	8,148	8.1	8	13.0
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,210	1.2	8	2.0
DC-8-61CF & 71CF	Main	15,472	15.5	8	25.0
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,210	1.2	8	2.0

**TABLE 5-5-17: McDonnell-Douglas (continued)**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
DC-9-10	Cabin	4,056	4.1	8	6.5
	Pit-Fwd	1,000	1.0	8	1.5
	Pit-Aft	619	0.6	8	1.0
DC-9-10AF	Main	2,386	2.4	8	4.0
	Pit-Fwd	373	.4	8	0.5
	Pit-Aft	327	.3	8	0.5
DC-9-30	Cabin	5,094	5.1	8	8.0
	Pit-Fwd	1,386	1.4	8	2.0
	Pit-Aft	832	.8	8	1.5
DC-9-32AF	Main	3,300	3.3	8	5.5
	Pit-Fwd	562	.6	8	1.0
	Pit-Aft	333	.3	8	0.5
DC-9-33CF	Main	2,944	2.9	8	4.5
	Pit-Fwd	562	.6	8	1.0
	Pit-Aft	333	.3	8	0.5
DC-40	Cabin	5,535	5.5	8	9.0
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,040	1.0	8	1.5
DC-10-10CF & 10F, also DC-10-30CF & 30F	Main	12,236	12.2	8	19.5
	Pit-Fwd	3,020	3.0	8	5.0
	Pit-Ctr	1,935	1.9	8	3.0
	Pit-Aft	510	.5	8	1.0
	Fl. Deck	400	.4	8	0.5
MD 8-61/63	Main	11,173	11.2	8	18.0
	Pit-Fwd	1,290	1.3	8	2.0
	Pit-Aft	1,210	1.2	8	2.0
MD8-62	Main	8,862	8.9	8	14.0
	Pit-Fwd	800	.8	8	1.5
	Pit-Aft	815	.8	8	1.5
MD9-10	Main	3,582	3.6	8	6.0
	Pit-Fwd	393	.4	8	0.5
	Pit-Aft	254	.3	8	0.5
MD9-30	Main	4,525	4.5	8	7.0
	Pit-Fwd	562	.6	8	1.0
	Pit-Aft	333	.3	8	0.5
MD9-40	Main	4,926	4.9	8	8.0
	Pit-Fwd	618	.6	8	1.0
	Pit-Aft	350	.4	8	0.5
MD-11F	Main Deck	15,530	15.5	8	25.0
	Lower Deck	4,976	5.0	8	8.0
MD-11 Combi	Main	5,822	5.8	8	9.5
	Pit-Fwd	3,655	3.7	8	6.0
	Pit-Ctr	2,685	2.7	8	4.5
	Pit-Aft	510	.5	8	1.0

TABLE 5-5-17: McDonnell-Douglas (continued)

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
MD-80 JT8D-217	Lower Hold	1,253	1.3	8	2.0
MD-80 JT8D-219	Lower Hold	1,013	1.0	8	1.5
MD 81 & 82	Cargo	1,253	1.3	8	2.0
MD-83	Cargo	1,013	1.0	8	1.5
MD-87	Cargo	938	.9	8	1.5
		or 697	.7	8	1.0
MD-88	Cargo	1,013	1.0	8	1.5
		or 1,253	1.3	8	2.0

TABLE 5-5-18: SAAB

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
340 B/QC	N/A	1,303	1.3	8	2.0

TABLE 5-5-19: Shorts

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
330	N/A	1,230	1.2	8	2.0
360 and 360-F	N/A	1,450	1.5	8	2.5

TABLE 5-5-20: Sidely

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Carvelle	Cabin	5,600	5.6	8	9.0
	Pit-Fwd	258	.3	8	0.5
	Pit-Aft	116	.1	8	... <sup>1</sup>

1 In these small volume spaces, use the extender and calculate the application time using a rate of 2.5 grams per second. At a rate of 2.5 grams per second, the following table will give the spray time:

1,000 ft <sup>3</sup> Units	Spray Time in Seconds
0.1	0.5
0.2	0.5
0.3	1.0
0.4	1.5

**TABLE 5-5-21: Tupolev**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
TU-154	Bulk	5,000	5.0	8	8.0

**TABLE 5-5-22: Vickers**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
Merchantman	Bulk	5,040	5.0	8	8.0
Viscount	Bulk	3,000	3.0	8	5.0

**TABLE 5-5-23: Military Aircraft**

Aircraft, model, and series	Area	Volume ft <sup>3</sup>	Aerosol Calculations		
			1,000 ft <sup>3</sup> Units	Grams/ 1,000 ft <sup>3</sup>	Spray Time in Seconds
C-5A	Main	46,651	46.7	8	74.5
	U. Deck	6,147	6.1	8	10.0
	Fwd. & Fl. Deck	5,147	5.1	8	8.0
	U. Floor	6,294	6.3	8	10.0
C-17	Main	20,875	20.9	8	33.5
C-26	Cabin	500	.5	8	1.0
	Pit	198	.2	8	0.5
C-130	Main	8,340	8.3	8	13.5
C-130 LG382		4,737	4.7	8	7.5
C-130 LG385-G		6,057	6.1	8	10.0
C-135	Cabin	6,000	6.0	8	9.5
C-141	Main	12,000	12.0	8	19.0
C-141B	Main	13,701	13.7	8	22.0
KC-10	Cabin	4,056	4.1	8	6.5
	Pit-Fwd	1,000	1.0	8	1.5
	Pit-Aft	619	.6	8	1.0

## T410—Tick Infestations

### Nonplant articles (i.e., bat guano, fence posts, etc.)

Pest: Ticks

Treatment: use T310 schedules, Tick infested materials (non-food)

## T411—Ant Infestations—Nonplant Products

T411 Pest: Ants

Treatment: T411 MB at NAP

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Minimum Concentration Readings (ounces) At:				
		0.5 hr	2.5 hrs	3 hrs	3.5 hrs	4 hrs
90-96°F	2 lbs	24	16	—	—	—
80-89°F	2.5 lbs	30	24	—	—	—
70-79°F	3 lbs	36	24	—	—	—
60-69°F	3 lbs	36	—	24	—	—
50-59°F	3 lbs	36	—	—	24	—
40-49°F	3 lbs	36	—	—	—	24

## T412—Noxious Weed Seeds (Devitalization Treatment)

### T412-a Noxious Weed Seeds (Devitalization Treatment)

Pest: Weed seeds of the following genera:  
*Asphodelius fistulosus* (onion weed)  
*Digitaria* sp. (includes couchgrass)  
*Guizotia abyssinica* (niger)  
*Oryza* sp. (red rice)  
*Paspalum scrobiculatum* (kodo millet)  
*Prosopis* sp. (includes mesquites)  
*Solanum viarum* (tropical soda apple)  
*Striga* sp. (witchweed)  
*Urochloa panicoides* (liver-seed grass)

Treatment: T412-a Heat Treatment at 248°F (120°C) for 15 minutes



Important

For *Guizotia abyssinica* (niger seed) use (T412-a). Do not start counting time until the entire mass reaches the required temperature.

### T412-b-1 Noxious Weed Seeds (Devitalization Treatment)

Pest: *Cuscuta* spp.

Two alternative treatments

Treatment: T412-b-1 Dry heat—commodity heated to 212°F (100°C) for 15 minutes

### T412-b-2 Noxious Weed Seeds (Devitalization Treatment)

Pest: *Cuscuta* spp.

Treatment: T412-b-2 Steam heat—commodity heated to 212°F (100°C) for 15 minutes

### T412-b-3 Noxious Weed Seeds (Devitalization Treatment)

Pest: Weed seeds of the following genera:  
*Asphodelus fistulosus* (onionweed)  
*Rottboellia cochinchinensis* (itchgrass)  
*Orobanche aegyptiaca* (branched broomrape)  
*Orobanche crenata* (crenate broomrape)  
*Orobanche cernua* (broomrape)  
*Striga asiatica* (witchweed)  
*Cuscuta* sp. (dodder)  
*Oryza* sp. (red rice)

Treatment: T412-b-3- Irradiation treatment for spices contaminated with noxious weed seeds.

A minimum dosage of 15 kilograys. Irradiation dosage shall not exceed 30 kilogray limit imposed by Food and Drug Administration for spices.



T412-b-3 is **not** authorized by APHIS for use until it is published in the Federal Register as a "Final Rule." This note will be removed when the "Final Rule" is published.

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## T413—Brassware from Bombay (Mumbai), India

### T413-a Brassware from Bombay (Mumbai), India

Two alternative treatments

Pest: ***Trogoderma granarium*** (khapra beetle)

Treatment: T413-a MB at NAP—tarpaulin or chamber

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Minimum Concentration Readings (ounces) At:		
		0.5 hr	2 hrs	12 hrs
90°F or above	2.5 lbs	30	20	15
80-89°F	3.5 lbs	42	30	20
70-79°F	4.5 lbs	54	40	25
60-69°F <sup>1</sup>	6 lbs	72	50	30
50-59°F	7.5 lbs	90	60	35
40-49°F <sup>2</sup>	9 lbs	108	70	40

- 1 Use MB 100 gas at 60°F or above
- 2 Use MB "Q" gas at 40°F or above



When both woodborers and khapra beetles are involved, use schedule T404-d.

## T413-b

### Brassware from Bombay (Mumbai), India

Treatment: T413-b MB in 26" vacuum

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Exposure Period
60°F or above <sup>1</sup>	8 lbs	3 hrs
40-59°F <sup>2</sup>	9 lbs	3 hrs

- 1 Use MB 100 gas at 60°F or above
- 2 Use MB "Q" gas at 40°F or above

Load limit is 75 percent of chamber volume.

## T414—Inanimate, Nonfood Articles with Gypsy Moth Egg Masses

### T414 Inanimate, Nonfood Articles with Gypsy Moth Egg Masses

Pest: Gypsy Moth egg masses

Treatment: T414 MB at NAP—tarpaulin or chamber

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Minimum Concentration Readings (ounces) At:				
		0.5 hr	4 hrs	8 hrs	12 hrs	16 hrs
50°F or above	3.5 lbs	42	28	—	—	—
	2.5 lbs	30	20	14	—	—
	2 lbs	24	16	12	12	10
40-49°F	4.5 lbs	54	36	—	—	—
	3.25 lbs	38	26	18	—	—
	2.25 lbs	30	20	14	14	12



For *Lymantria dispar* (gypsy moth) egg masses on such items as outdoor household articles, quarry products, lumber, logs, and timber products.

## T415— Garbage (Two Alternative Treatments)

### T415-a Garbage

Pest: Insect Pest and Pathogens

Treatment: T415-a Heat Treatment- Incinerate to ash.



Caterers under compliance agreement using an incinerator for garbage must comply with the following conditions:

- Incinerator must be capable of reducing garbage to ash
- Incinerator must be maintained adequately to assure continued operation

### T415-b Garbage

Pest: Insect Pest and Pathogens

Treatment: T415-b Dry heat or Steam- commonly heated to internal temperature of 212°F (100°C) for 30 minutes followed by burial in a landfill.



Caterers under compliance agreement using a sterilizer must comply with the following conditions:

-The sterilizer must be capable of heating garbage to an internal temperature of 212° F and maintaining it at that temperature for a minimum of 30 minutes.

-Re-evaluate and adjust the sterilization cycle twice a year using a thermocouple to recalibrate the temperature recording device. Adjusting the sterilization cycle semiannually will assure that all garbage processed is heated to a minimum internal temperature of 212° F for at least 30 minutes, and that the temperature recording device accurately reflects the internal temperature of the sterilizer.



Observe all reevaluations and adjustments.

-The operator is to date and initial time/temperature records for each batch of garbage sterilized. The supervisor is to review and sign each time/temperature record. The facility must retain records for 6 months for review by PPQ.

-Clean the drain in the bottom of the sterilizer between each cycle to assure proper heat circulation

## T415-C

### Garbage

Pest: Insect Pest and Pathogens

Treatment: T415-c Grinding and discharge into an approved sewage system



Grinding and discharging is allowed into an approved sewage system. An approved sewage system means a sewage system approved by the Administrator of APHIS upon his determination that the system is designed and operated in such a way as to preclude the discharge of sewage effluents onto land surfaces or into lagoons or other stationary waters, and otherwise is adequate to prevent the dissemination of plant pests and livestock or poultry diseases, and that it is certified by an appropriate government official as currently complying with the applicable laws for environmental protection.

## T416—Goatskins, lambskins, sheepskins (skins and hides) (three alternative treatments)."

### T416-a-1 Goatskins, lambskins, sheepskins (skins and hides)

Pest *Trogoderma granarium* (Khapra beetle)

Treatment MB ("Q" gas only) at NAP--tarpaulin

Temperature	Dosage Rate (lb/ 1,000 ft <sup>3</sup> )	Minimum Concentration Readings (ounces) At:		
		0.5 hr	2 hrs	12 hrs
90°F or above	2.5 lbs	30	20	15
80-89°F	3.5 lbs	42	30	20
70-79°F	4.5 lbs	54	40	25
60-69°F	6 lbs	72	50	30
50-59°F	7.5 lbs	90	60	35
40-49°F	9 lbs	108	70	40

The sorptive rates of commodities vary. When a commodity is known or suspected to be sorptive (see [T307-a](#)), take more T/C readings than normal. Additional fumigant is added as prescribed on [page-2-4-22](#).



Items known to be sorptive or items whose sorptive properties are unknown are not to be fumigated in chambers at NAP unless T/C readings are taken.



Fur, horsehair articles, and leather goods (skins and hides), may cause off-odors that may be unacceptable when exposed to methyl bromide (MB).

When both woodborers and khapra beetles are involved, use schedule [T404-d](#).

### T416-a-2 Goatskins, lambskins, sheepskins (skins and hides)



Load limit is 75 percent of chamber volume.

Pest *Trogoderma granarium* (Khapra beetle)

Treatment MB ("Q" label gas) in 26" vacuum

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Exposure Period
60°F or above	8 lbs	3 hrs
40-59°F	9 lbs	3 hrs



Important

Fur, horsehair articles, and leather goods (skins and hides), may cause off-odors that may be unacceptable when exposed to methyl bromide (MB).

### T416-a-3

### Goatskins, lambskins, sheepskins (skins and hides) (three alternative treatments).

Pest *Trogoderma granarium* (Khapra beetle)

Treatment MB ("Q" gas only) in 26" vacuum--chamber

Temperature	Dosage Rate (lb/1,000 ft <sup>3</sup> )	Exposure Period
90-96°F	2.5 lbs	12 hrs
80-89°F	3.5 lbs	12 hrs
70-79°F	4.5 lbs	12 hrs
60-69°F	6 lbs	12 hrs
50-59°F	10 lbs	12 hrs
40-49°F	12 lbs	12 hrs

The sorptive rates of commodities vary. When a commodity is known or suspected to be sorptive (see **T307-a**), take more T/C readings than normal. Additional fumigant is added as prescribed on page 2.2.34.



Important

Items known to be sorptive or items whose sorptive properties are unknown are not to be fumigated in chambers at NAP unless T/C readings are taken.



Important

Fur, horsehair articles, and leather goods (skins and hides), may cause off-odors that may be unacceptable when exposed to methyl bromide (MB).

When both woodborers and khapra beetles are involved, use schedule **T406-c**.

## Amount of Phosphine Liberated by Various Products

Calculate amount of product needed by using the amount of phosphine released as shown in the right column.

**TABLE 5-5-24: Amount of Phosphine Liberated by Various Products**

Product	Type	Unit and weight in grams	Grams of phosphine*
Degesch Fumi-Cel®	MP	1 plate; 117.0	33.0
Degesch Fumi-Strip®	MP	16 plates; 1872.0	528.0
Degesch Phostoxin®	AP	1 tablet; 3.0	1.0
Degesch Phostoxin® Tablet Prepac Rope	AP	1 prepac; 99.0 (strip or rope of 33 tablets)	33.0
Detia	AP	1 tablet; 3.0	1.0
Detia Rotox AP	AP	1 pellet; 0.6	0.2
Detia Gas EX-B	AP	1 bag or sachet; 34.0	11.4
Fumiphos tablets	AP	1 tablet; 3.0	1.0
Fumiphos pellets	AP	1 pellet; 0.6	0.2
Fumiphos bags	AP	1 bag; 34.0	11.0
Fumitoxin	AP	1 tablet; 3.0	1.0
Fumitoxin	AP	1 pellet; 0.6	0.2
Fumitoxin	AP	1 bag; 34.0	11.0
Gastoxin	AP	1 tablet; 3.0	1.0
Gastoxin	AP	1 pellet; 0.6	0.2
"L" Fume	AP	1 pellet; 0.5	0.18
	AP	1 pellet; 0.6	0.22
Phos-Kill	AP	1 tablet; 3.0	1.1
Phos-Kill	AP	1 pellet; 0.6	0.22
Phos-Kill	AP	1 bag; 34.0	12.0

\* Reacts with moisture in the air to yield grams of phosphine.