December 1, 1975
RESEARCH PRODUCTS COMPANY
Box 1057
Salina, Kansas 67401

DETIA GAS EX-B Instruction Booklet

1 Of 5

Detia

GAS-EX-B

INSTRUCTION BOOKLET

Remove and Unfold For

USE DIRECTIONS

DIRECTIONS – SPECIFIC

ALWAYS OPEN CANS IN OPEN AIR IMMEDIATELY PRIOR TO USE. USE AL BAGS . . . BAGS CANNOT BE SAVED. ALWAYS WORK IN PAIRS, NEVER ALONE. BULK STORED GRAIN: Add bags to grain stream as silos or bins are filled. Filling must be continuous. Determine additions sequence on a bags per-minute-basis to insure even distribution throughout. Keep an accurate count as removal of the bags from the grain is required once the grain is moved or transferred. Removal of bags is accomplished by transfer of the grain over a screen or scalperator. Close bin openings, seal and post warning signs.

COMMODITIES IN SPACE:

(1) Warehouses and Vaults: Place bags on floor in systematic manner. Use total floor space available. Do not toss bags into inaccessible areas.

(2) Box Cars, Bulk Rail Cars, Static Trailer Vans, Shipping Containers: Place and tape bags on rigid perforated cardboard with spacing between bags. Tape across the bag ends only. Place or fix the cardboard, bag-side up, inside the box-car, van or shipping container. In the case of bulk rail cars place the cardboard on the flanges of the hatch openings. This may require cutting the cardboard to size. Close, seal and post warning signs on doors or hatch covers.

When fumigating rail cars in transit it is necessary to provide the [illegible] with bag disposal instructions and first aid procedures. These are available from Research Products Company.

IMPOR

The release of phosphine from Detia Gas Ex-B humidity. Plan fumigations accordingly.

MINIMUM EXPOSUR

Commodity Temperature	
Below 40°F	. . . . .
40°F – 49°F	. . . . .
50°F – 59°F	. . . . .
60°F – 77°F	. . . . .
Above 77°F	. . . . .

NOTE: Aerate all fumigated products for al
Note specific aeration instructions fo

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When fumigating rail cars in-transit it is necessary to provide the receiver with bag disposal instructions and first aid procedures. These are available from Research Products Company.

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December 1, 1975
RESEARCH PRODUCTS COMPANY
Box 1057
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DETIA GAS EX-B Instruction Booklet

DIRECTIONS – GENERAL

DETIA GAS EX–B is effective in providing economic levels of control of:

Granary Weevil, Rice Weevil, Lesser Grain Borer, Saw-Toothed Grain Beetle, Confused Flour Beetle, Cadelle, Angoumois Grain Moth, Khapra Beetle, Indian Meal Moth, Yellow Meal Worm, Red Flour Beetle, Spider Beetle, Hairy Fungus Beetle, Mediterranean Flour Moth, Dried Fruit Moth, Bean Weevil, Cigarette Beetle and Tobacco Moth

Its use is suited for the fumigation of bulk stored grain, and certain commodities in space: Box cars and bulk rail cars (static or in-transit) vaults, warehouses, static trailer vans (Not tarped grain trailers) and shipping containers. A fumigation consists of placing the bags in a specified manner once the facility being fumigated has been prepared. Minimum preparation consists of:

1. Notifying local authorities (Fire, Police, etc.)
2. Sealing area or structure as gas tight as possible.
3. Posting of danger signs.
4. Being certain first aid information and proper respiratory equipment is at the site.
5. Being certain that all adjoining facilities are evacuated.
6. Being certain of the recommended application procedure.
7. Being certain that operators have been trained and have read and understood labeling.

DIRECTIONS – SPECIFIC

ALWAYS OPEN CANS IN OPEN AIR IMMEDIATELY PRIOR TO USE. USE ALL BAGS . . . BAGS CANNOT BE SAVED. ALWAYS WORK IN PAIRS, NEVER ALONE. BULK STORED GRAIN: Add bags to grain stream as silos or bins are filled. Filling must be continuous. Determine additions sequence on a bags per-minute-basis to insure even distribution throughout. Keep an accurate count as removal of the bags from the grain is required once the grain is moved or transferred. Removal of bags is accomplished by transfer of the grain over a screen or scalperator. Close bin openings, seal and post warning signs.

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IMPORTANT

The release of phosphine from Detia Gas Ex-B is dependent on atmospheric temperature and humidity. Plan fumigations accordingly.

MINIMUM EXPOSURE REQUIREMENTS

Commodity Temperature	Minimum Exposure Period
Below 40°F.	Do not fumigate
40°F – 49°F	14 days (336 hours)
50°F – 59°F.	7 days (168 hours)
60°F – 77°F.	4 days (96 hours)
Above 77°F.	3 days (72 hours)

NOTE: Aerate all fumigated products for at least 48 hours before offering to consumer. Note specific aeration instructions for tobacco.

DOSAGE SCHEDULE

ABOUT DOSAGE: Satisfactory results with Detia Gas Ex-B are dependent upon obtaining a tight seal of the structures to be fumigated. The Dosage Schedule reflects a dosage range. The lower level should only be used in tightly sealed structures. The higher level should be used if sealing has been difficult or if other adverse conditions are present, such as high wind. The higher level should also be used if Rice Weevil are present.

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BULK STORED GRAIN

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans

DOSAGE: 6 – 10 Bags per 1000 Bushels

BAGGED GRAIN

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans

DOSAGE: 6 – 6 Bags per 1000 Cubic Feet

BAGGED PACKAGE TREATED SEEDS FOR PLANTING USE ONLY

DOSAGE: 6 – 6 Bags per 100 Cubic Feet

OTHER RA

Cocoa Beans, Coffee Beans (ra
Cashews, Brazil Nuts, Almonds,

DOSAGE: 6 – 6 Bags per 1000 C

Cotton (cloth and unprocessed),
Mos Hair, Raw Wool

DOSAGE: 6 – 6 Bags per 1000 C

BULK STORED GRAIN

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans

DOSAGE: 6 – 10 Bags per 1000 Bushels

BAGGED GRAIN

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans

DOSAGE: 3 – 6 Bags per 1000 Cubic Feet

BAGGED (PACKAGED) TREATED SEEDS FOR PLANTING USE ONLY

DOSAGE: 3 – 6 Bags per 1000 Cubic Feet

OTHER RAW AGRICULTURAL COMMODITIES

Cocoa Beans, Coffee Beans (raw), Dates, Filberts, Pecans, Pistachio Nuts, Walnuts, Cashews, Brazil Nuts, Almonds, Peanuts, Sunflower Seeds, Cotton Seed

DOSAGE: 3 – 6 Bags per 1000 Cubic Feet

ANIMAL FEEDS

[illegible] 6 Bags per 1000 Cubic Feet

NON-FOOD PRODUCTS

Cotton (cloth and unprocessed), Feathers, Human Hair, Rubberized Hair, Vulcanized Hair, Misc Hair, Raw Wool

DOSAGE: 3 – 6 Bags per 1000 Cubic Feet

PROCESSED FOODS

Wheat Bran, Polished Rice, Brewers Rice Grits, Corn Grits, Flour, Macaroni, Spaghetti, Packaged Cereals, Pretzels, Oat Meal, Cake Flour, Spices, Whole Wheat, Bulgar, Brewers Malt, Barley Malt, Wheat Germ, Cream of Wheat, Wheat Chorts, Processed Coffee, Tea (roasted-dried), Prepared Cocoa, Dried Processed Milk-Fluid Cheese, Seasoning, Condiments (ground), Cookies, Crackers, Snack Foods, Herbs, Dried Fruits [redacted] Eggs Sugars-Candy Bars (Candy, Pastry Mixes (Dried Powdered Milk, Nuts-Processed

DOSAGE [illegible] Bags per 1000 Cubic Feet

TOBACCO

Tobacco Temperature ABOVE 60°F		
Temperature	Dosage: Bags/1000 cubic feet	Minimum Exposure
Above 68°F.	2	4 days
60° – 68°F.	2	6 days
Post Fumigation Aeration:	Hogsheads	3 days minimum
	Other	2 days minimum

Tobacco Temperature: 40° – 59°F.		
For Kill of Cigarette Beetle Larvae		
Temperature	Dosage: Bags/1000 cubic feet	Minimum Exposure
40° – 59°F.	2	See Below

Best results are achieved when tobacco is fumigated at temperatures above 60°F. However, where it is not possible to achieve those temperatures, fumigation at temperatures in the 40°–59°F. range have provided satisfactory controls of the cigarette beetle larvae. Eggs and pupae of the cigarette beetle may survive a fumigation at those lower temperatures. The appropriate exposure periods for fumigation of tobacco are:

59°F. . . . . 168 hours
40°F. . . . . 336 hours

NOTE: Warehouses and containers must be tightly sealed.
Post fumigation aeration time is a minimum of 4 days.

December 1, 1975
RESEARCH PRODUCTS COMPANY
Box 1057
Salina, Kansas 67401

DETIA GAS EX-B Instruction Booklet

Minimum Exposure 4 days 6 days 3 days minimum 2 days minimum

Minimum Exposure See Below nperatures above 60°F. ures, fumigation at tem- controls of the cigarette survive a fumigation at for fumigation of to- ours ours

NOTE TO USER: For technical assistance or additional information contact:

RESEARCH PRODUCTS COMPANY
P.O. Box 1057
1635 East North Street
Salina, Kansas 67401

Telephone: (913) 827-3665

December 1, 1975
RESEARCH PRODUCTS COMPANY
Box 1057
Salina, Kansas 67401

DETIA GAS EX-B, EPA Reg. no. 2548-59

EPA REG. NO. 2548-59
EPA EST. NO. 33983WG01

PAT. NO. 3,372,088

Detia®

GAS-EX-B

ACTIVE INGREDIENT:	**Aluminum Phosphide**	57%
INERT INGREDIENTS:		43%
		100%

POISON

DANGER:

KEEP OUT OF THE REACH OF CHILDREN

See side panels for antidote and additional precautionary statements.

CONTENTS	NET WT. EACH	TOTAL NET WT.
6 Active Bags (Normal Size)	34 grams	204 grams (7.2 oz)
2 Inactive Degassing Bags	30 grams	60 grams

MANUFACTURED BY:

DR. WERNER FREYDERG · CHEMISCHE FABRIK
694 WEINHEIM/BERGSTRASSE (WESTERN GERMANY)

DISTRIBUTED BY 75021

Research Products Company

TELEPHONE (913) 827-5565 P.O. BOX 1057 1825 EAST NORTH ST. SALINA, KANSAS 67401

INTRODUCTION

Detia Gas Ex-B is an aluminum phosphide preparation pre-packed into special paper sachets (bags) which liberate poisonous phosphine gas (PH_3---Hydrogen Phosphide) once removed from the can and exposed to atmospheric air and moisture. Detia Gas Ex-B is effective in providing economic levels of control of certain insects injurious to grain, other raw agricultural commodities, specified processed foods, animal feeds, seed grain and tobacco. See Instruction Booklet attached to can for details.

DANGER

PHOSPHINE IS POISONOUS WITH AN ODOR ASSOCIATED WITH COMMERCIAL CARBIDE

DO NOT BREATHE DUST OR FUMES! DO NOT GET CONTENTS OF BAGS IN EYES, ON SKIN, OR ON CLOTHING! POISONOUS IF SWALLOWED! DO NOT EAT, SMOKE OR DRINK WHILE HANDLING! WASH HANDS THOROUGHLY WITH SOAP AND WATER AFTER HANDLING! DO NOT ENTER ANY AREA UNDER FUMIGATION! ALWAYS WORK IN PAIRS OR MULTIPLES THEREOF WITH GAS MASKS READILY AVAILABLE AT ALL TIMES. THE RECOMMENDED GAS MASK IS A "FULL FACED" ALL SERVICE TYPE, FITTED WITH A CANISTER DESIGNED FOR PHOSPHINE GAS ONLY, APPROVED BY U.S. DEPT. OF INTERIOR, BUREAU OF MINES, FOR PHOSPHINE PROTECTION.

CAUTION

SPONTANEOUS IGNITION MAY RESULT IF BAGS COME INTO CONTACT WITH WATER OR OTHER LIQUIDS. DO NOT USE BAGS THAT HAVE BEEN OR ARE WET! DO NOT USE BAGS THAT HAVE BEEN DAMAGED! DO NOT WRAP, COVER OR CONFINE BAGS. DO NOT LET BAGS CONTACT EACH OTHER DURING USE! DO NOT ATTEMPT TO SAVE BAGS ONCE REMOVED FROM CAN. DO NOT TEAR BAGS OPEN FOR ANY REASON DURING APPLICATION. AERATE ALL FUMIGATED PRODUCTS FOR AT LEAST 48 HOURS BEFORE OFFERING TO CONSUMERS.

NOTE: PHOSPHINE REACTS CORROSIVELY WITH COPPER, BRASS [illegible] OTHER PRECIOUS METALS.

Classified by Underwriters Laboratories [illegible] directed in the instructions on the container. [illegible] Fumigant Powder [illegible] table itself, but [illegible] Spontaneous ignition [illegible] chemicals [illegible]

STORE ONLY IN COOL, D
FROM MOISTURE. OPEN F
NEVER STORE NEAR HOME
FOR ANY PURPOSE. DISP

Sensation of Cold
Diarrhea
Vomiting
Dizziness

Any of the above may be taken
appearance that someone has be
DIATELY AND CALL A DOCT
blankets. Supply patient with p
until the Doctor arrives. In the e
remove victim to open air, remo
of salt in a glass of warm water.

DIS

IMPORTANT: The release of phos
atmosphere and humidity. [illegible]
attempting disposal.

MINIM

Below 40° F
40° F – 49°F
50° F – 59°F
60° F – 79°F
Above 79° F

METHOD ONE: [illegible] aluminum
Collect bags and arrange for their
pesticide incinerator for burning.
METHOD TWO: For use when mail
[illegible] exposure
[illegible]

[illegible] protection equipment
respiratory [illegible]
[illegible]

[illegible] dilute [illegible]
and [illegible] contrary to label

PAT. NO. 3,372,088

sphide 57%
. . . . . 43%
100%

HILDREN
ionary statements.

TOTAL NET WT.
204 grams (7.2 oz)
60 grams

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cto Company

ST., SALINA, KANSAS 67401

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NOTE: PHOSPHINE REACTS CORROSIVELY WITH COPPER, BRASS, GOLD OTHER PRECIOUS METALS.

Classified by Underwriters Laboratories Inc. as fire hazard only when used specifically as directed in the instructions on this container. Powder [illegible] readily [illegible] table itself, but conducive to moist air or water releases flammable and toxic phosphine gas. Spontaneous ignition may result if contacted by water, acids or chemicals. See U.L. Classified Products Index, 1957.

STORE ONLY IN COOL, DRY, LOCKED, VENTILATED ROOM. PROTECT FROM MOISTURE, OPEN FLAMES, HEAT, ACIDS AND OTHER CHEMICALS. NEVER STORE NEAR HOMES OR LIVING QUARTERS. DO NOT RE-USE CANS FOR ANY PURPOSE. DISPOSE OF BY CRUSHING FOLLOWED BY BURIAL.

ANTIDOTE-FIRST AID

Symptoms of Phosphine Poisoning

Sensation of Cold	Dry Cough	Gastric Pains
Diarrhea	Loss of Appetite	Enlarged Pupils
Vomiting	Intense Thirst	Choking Attacks
Dizziness	Acute Indigestion	Reeling

Any of the above may be taken as symptoms of phosphine poisoning. At first warning or appearance that someone has been affected by phosphine, take them to FRESH AIR IMMEDIATELY AND CALL A DOCTOR! The patient should be laid down and kept warm with blankets. Supply patient with pure oxygen and maintain respiration artificially if required, until the Doctor arrives. In the event of ingestion of the dust-like preparation inside the bag, remove victim to open air, remove contaminated clothing, induce vomiting with teaspoonfuls of salt in a glass of warm water. Repeat until vomit fluid is clear. Call Doctor immediately.

DISPOSAL INSTRUCTIONS

IMPORTANT: The release of phosphine from Detia Gas Ex-B is dependent on the [illegible] temperature and humidity. Do certain minimum temperature requirements [illegible] before attempting a special.

MINIMUM EXPOSURE REQUIREMENTS

Below 40° F	[illegible]
40° F – 49° F	14 days (336 hours)
50° F – 59° F	7 days (168 hours)
60° F – 77° F	4 days (96 hours)
Above 77° F	3 days (72 hours)

METHOD: [illegible] minimum exposure [illegible] existing conditions [illegible] Collect bags and arrange for their direct [illegible] to an approved burial site [illegible] protected [illegible]

Method [illegible] remove [illegible] bags [illegible] exposed [illegible] bags [illegible] Recovery.

Collect bags and [illegible] canister for protection [illegible] inspection [illegible] volume [illegible]

Some [illegible] directed on the label. Buyer [illegible] and or handling is contrary to these instructions.

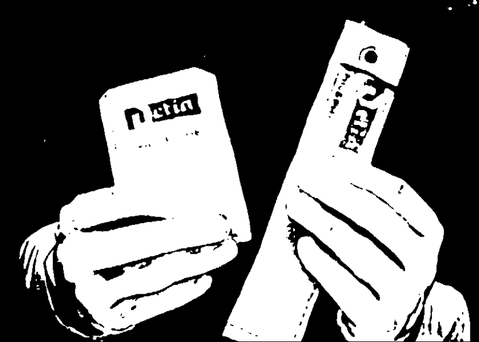
PROPER HANDLING, FIRST AID AND DISPOSAL OF

Detia

GAS EX-B

A PHOSPHINE FUMIGANT

comments



TABLL OF CONTENTS

INTRODUCTION

This bulletin has been prepared by Research Products Company, exclusive for Detia Gas Ex-B, in the interest of fumigating users with respect to the proper handling of Detia Gas Ex-B as well as providing specific technical information.

The history of Detia Gas Ex-B is one dating back to the mid 1930's. Only recently has it been introduced into the U.S.A. and Canada. The manufacturer of the product, Dr. Werner Freyberg, Chemische Fabrik Weinheim, West Germany, invented the Detia Gas Ex-B concept.

Needless to say, Detia Gas Ex-B is a pesticide fumigant. It cannot be used properly or effectively unless the proper handling techniques are designed to accomplish specific objectives when used in a prescribed manner. And, it can be misused which could lead to situations that might be potentially harmful to man.

It is the intent of Research Products Company to provide information via this bulletin which will be beneficial in the thorough training of users. All potential users should read this bulletin and consult with other literature and instruction provided by Research Products Company.

WHAT IS DETIA GAS EX-B

It is a fumigant utilizing a packaging concept that permits the easy, safe handling of a solid form of a gas fumigant for the purpose of killing insect pests. The packaging concept is important to users as it affords a method of fumigation whereby the likelihood of product contamination is minimized. Additionally, the concept affords the user a labor-saving convenience during application as well as during disposal.

The active ingredient in Detia Gas Ex-B is aluminum phosphide. When carefully and exactly combined with other chemical compounds, the preparation will, upon exposure to atmospheric moisture, release *hydrogen phosphide*. Hydrogen phosphide is commonly known as phosphine — a widely used and effective fumigant.

The Detia Gas Ex-B concept is one that permits the packaging of the aluminum phosphide preparation into paper bags which becomes an integral part of the concept. Therefore, the bags should never be torn open during fumigation. Once the bags are removed from the original shipping container, a hermetically sealed metal can, they will begin to release hydrogen phosphide in quantity after approximately 30 minutes. The release is dependent on atmospheric temperature and relative humidity. The greater the temperature and humidity, the faster the release.

WHAT IS HYDROGEN PHOSPHIDE

Hydrogen phosphide, more commonly known and referred to as phosphine, is a colorless toxic gas possessing an odor like that of decaying fish, garlic or commercial carbide. It is a very active gas with a very high vapor pressure. The penetrating capability of phosphine is great. And, even though heavier than air, it acts very much like a gas in a vacuum. The combination of high molecular activity, vapor pressure and toxicity to insects accounts for its world-wide acceptance as a fumigant. Actually, phosphine does not present the residue problems inherent with other commercial, liquid fumigants. Residual tolerances have been established [illegible] for various specific commodities [illegible]

PHYSICAL CONSTANTS

Chemical Formula	PH_3
Molecular Weight	34.04
Vapor Pressure 70 deg F	[illegible]
Specific Volume	
70 deg F 1 atm	[illegible]
Boiling Point 1 atm	124.9 deg F
Freezing Point 1 atm	[illegible] deg F
Density 32 deg	1.529 g
Density Liquid 194 deg F	
90 deg C	[illegible] g/m
Specific Gravity Gas 68 deg F	
20 deg C air 1	1.183
Critical Temperature	124.3 deg F
	51.3 deg C
Critical Pressure	948 P.S.I.A.
	64.5 atm
*Lower Explosion Limit	1.79-1.89
	by volume
	26.15-
	27.6 g/m
	17,000 [illegible]
	18,900 PPM*
Threshhold Limit Values	
Maximum Allowable Concentration	
8 hr. working day	0.3 PPM

Reference: International Critical Tables - Pages 3, 4, 8, 22, 23, 116, 180, 109, 213, 228, 229, 246, 259, 260

*[illegible]

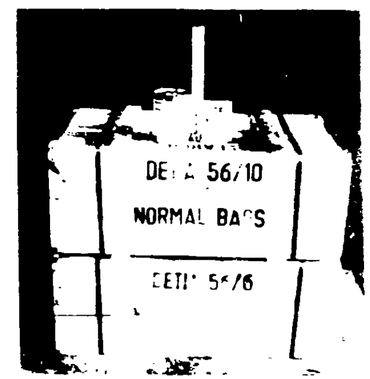
ABOUT THE BAG

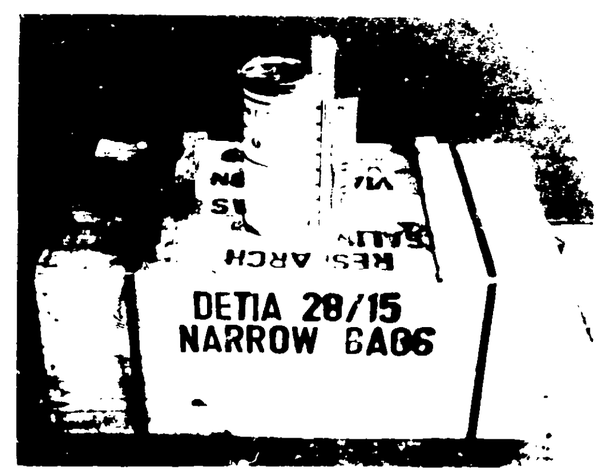
[illegible] vessel for a skillfully prepared aluminum phosphide preparation. The bag in combination with the preparation permits the controlled release of phosphine. The tough expandable permeable paper used is an integral part of the overall concept.

There are two (2) basic bags. One is referred to as normal size and the other as long narrow. Both contain exactly the same quantity of preparation.

44 Grams	57% Aluminum Phosphide
	43% Inert Ingredients

Both release 11 grams of phosphine when exposed to moist air. The Long Narrow is particularly adaptable to flat stored grain. The Normal bag is particularly adapted to commodity fumigation in space. However the Long Narrow is often used for space as well.





WHERE CAN DETIA GAS EX-B BE USED

[illegible] commodities [illegible] bulk rail cars, vaults [illegible] commodities under tarp [illegible] buildings [illegible] gas tight.

[illegible] Detia Gas Ex-B bags are particularly [illegible] for stored bulk grain. An eyelet in the [illegible] insertion into grain by means of [illegible]. Normal bags may be added directly [illegible] as bins or silos are filled. In either case it [illegible] necessary to provide for the removal of the bags after fumigation is complete.

All pesticides must be registered with the Environmental Protection Agency, Pesticide Registration Division, of the U.S.A. Government and similar agencies in other countries. Detia Gas EX-B is registered for use on specified processed foods, specified raw agricultural commodities, stored grain, animal feeds and tobacco.

A complete listing of commodities is shown on the [illegible]. A partial list is shown below:

Rice	Polished Rice	Oat Meal
Wheat	Brewers Rice Grits	Cake Flour
Barley	Corn Grits	Spices
Corn	Flour	Whole Wheat
Oats	Tobacco	Bulgar
Sorghum	Macaroni	Brewers Malt
Millet	Spaghetti	Wheat Germ
Rye	Packaged Cereals	Cream of Wheat
Wheat Bran	Pretzels	Animal Feeds

The registered use of Detia Gas Ex-B is in a [illegible] process of expansion as research and [illegible] proceeds. From time to time the [illegible] expanded to include other foods [illegible].

Detia Gas Ex-B is used for the control [illegible] registered pests:

[illegible] *Stored Stores* [illegible]
[illegible] *Stophilus oryzae* [illegible]
[illegible] *Rhyzopertha dominica* [illegible]
[illegible] *Tribolium castaneum*
[illegible] *Plodia interpunctella*
[illegible] *Warehouse Indian meal moth*
[illegible] *Trogoderma granarium* [illegible]
[illegible] *Ptinus*
[illegible] *Lyctus brunneus*
[illegible] *American Spider beetle*
[illegible] *Acanthoscelides obtectus* Sal.
[illegible] Beetle *Caryedon serratus*
[illegible] Moth *Depha [illegible] Phaseolus*
[illegible] Grain Moth *Sitotroga cerealella*
[illegible] *Indianmeal, maidenmeal*
[illegible] Beetle *Trogoderma granarium*

HOW IS DETIA GAS EX-B USED

The Detia Gas Ex-B concept suggests convenience of use. However, there are specific procedures to be followed which insure effective results. Recommended methods of application are described separately from this bulletin.

A Detia Gas Ex-B fumigation consists of placing the bags in a specified manner within a structure that can be sealed virtually gas tight. After a building, rail car, warehouse, etc., has been fully prepared and sealed it is simply a matter of determining the correct dosage, opening the cans and placing the bags in the prescribed manner.

CAN DETIA GAS EX-B BE MIS-USED

All fumigants can be mis-used. A mis-use is any use that contributes to ineffective results or is likely to result in a situation that is potentially dangerous.

1. The dosage recommendations for Detia Gas Ex-B have been carefully calculated. Users should never exceed label recommendations. Nor should they under-dose. Generally a dosage of 3 bags/1000 cubic feet is adequate provided the exposure period is at least 72 hours with constant temperature above 77° F and relative humidity in excess of 60%. *A shortened exposure period cannot be compensated for with increased dosage.* While it is possible to use Detia Gas Ex-B at temperatures as low as 40° F, to do so necessarily increases the exposure period to possibly impractical limits.

2. Phosphine is a very active gas with a high vapor pressure. Even though extremely toxic to insects, it is absolutely necessary that any structure being fumigated be sealed as gas tight as possible. To miss sealing any single large opening, such as a vent or small window, will ruin a fumigation. To miss sealing only a few very small openings or cracks will materially affect results.

3. Detia Gas Ex-B bags [illegible] allow the build-up of gas above [illegible] fumigation will reach the [illegible] level of 179 [illegible]. Since the [illegible] dosage [illegible] that [illegible] reach the [illegible]

[illegible] with water or other liquids causes [illegible] Spontaneous fumigation [illegible] unless the following are [illegible]: Do not use bags that have been exposed to water or other liquids in any way. Do not use bags when they are liable to come [illegible] contact with water or other liquids. Do not use bags that have been damaged in any way. Do not wrap copper or copper tubing used in [illegible] bags. Do not have bags contact each other.

4. The release of phosphine from Detia Gas Ex-B is controlled by design. The release begins slowly after 30 minutes or so, gradually building up to peak levels after 20 hours. *The release cannot be speeded up.* To attempt to do so is potentially dangerous.

5. Phosphine is capable of penetration through a wide variety of dense and or seemingly gas tight materials. Hadite block walls, for example, will be penetrated quickly. The end result will be an ineffective kill and the endangerment of life in adjoining rooms. The same would be true of poorly constructed wooden buildings. Leakage from stationary structures can be off-set somewhat, but not entirely, by increasing the dosage to the highest recommended level.

6. Phosphine reacts corrosively with copper, brass, gold and other precious metals. Thus, switch gear, communication devices, small electric motors, etc., should be protected or removed from the area to be under gas. Protection can be afforded with vaseline on contact points or totally wrapping devices with heavy polyethylene film.

STORAGE AND HANDLING PRECAUTIONS

Hermetically sealed cans of Detia Gas Ex-B are shipped in heavy wooden crates. As long as crates and or cans are not opened, the shelf life is practically unlimited. Cans and crates should be stored in cool, dry, locked rooms.

1. Protect cans and crates from moisture, open flame, heat, acids, and other chemicals.
2. Never store near homes or living quarters.
3. Never store in areas prone to vandalism.

In addition to instructions [illegible] on the label, be certain to:

Study the [illegible]

Notify [illegible]

[illegible] Detia Gas Ex-B [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Always open cans in open air.

Never smoke or eat while handling the bags.

Always wash hands after handling the bags.

Never attempt to seize bags. IT CANNOT BE DONE!

DISPOSAL OF DETIA GAS EX-B

IMPORTANT: The release of phosphine from Detia Gas Ex-B is dependent on atmospheric temperature and humidity. Be certain minimum temperature requirements have been met before attempting disposal.

MINIMUM EXPOSURE REQUIREMENTS

Below 40° F	Do not fumigate
40°-49° F	14 days, 336 hours
50°-59° F	7 days, 168 hours
60°-77° F	4 days, 96 hours
Above 77° F	3 days, 72 hours

METHOD ONE: Use only if minimum exposure requirements for existing conditions are known and met.

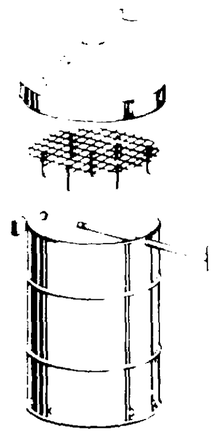
Collect bags and arrange for their direct transportation to an approved burial site or to an approved pesticide incinerator for burning.

METHOD TWO: For use when minimum exposure requirements for existing conditions have *not been met*, or if exposure details are *unknown*.

Collect bags and transport them to an isolated open area. Wear a full faced gas mask fitted with a canister for protection against phosphine. Cut or tear open each bag and dump the contents into a receptacle (bucket, barrel, etc.) containing a mixture of water and a non-ionic surfactant (2% by volume). Stir until all dust has settled. Transport the resulting slurry to an approved site for burial.

Method One is only applicable when it is known that minimum exposure requirements have been met. Whenever possible, such spent bags should be transported directly and immediately to an approved burial site or to an approved pesticide incinerator for burning. THE SPENT BAGS SHOULD NEVER BE PLACED IN ORDINARY TRASH RECEPTACLE OR DUMPSTERS, NOR SHOULD THEY EVER BE TRANSPORTED TO THE DISPOSAL SITE BY ANYONE OTHER THAN THE ACTUAL USER. In lieu of immediate disposal, it may be more practical, particularly in the case of smaller users, to collect spent bags and place them into an especially designed 55 gallon drum as illustrated on next page.

Note the cone shaped [illegible] expanded metal false floor, the [illegible] diameter hole evenly spaced around the [illegible] the 5x1 diameter holes in the bottom [illegible] and the locking device. The purpose of the drum is to provide a central, known collection point for bag



the drum can be transported directly to an approved disposal site WITHOUT EXCEPTION THE TRANSPORTATION MUST BE PERFORMED BY THE USER BEING CERTAIN THAT WHEN THE DRUM IS EMPTIED THAT THE BAGS ARE IMMEDIATELY BURIED OR BURNED IN THE CASE OF AN APPROVED PESTICIDE INCINERATOR

The drum should be located in an open secured area known to all and marked as the collection center for spent Detia Gas Ex-B

METHOD TWO Detia Gas Ex-B is often used for the fumigation of rail cars intransit BECAUSE THERE IS A CHANCE THAT INTRANSIT TIME HAS BEEN TOO SHORT TO PERMIT COMPLETE GAS RELEASE RECEIVERS OF FUMIGATED CARS MUST BE PREPARED TO DEAL WITH PARTIALLY SPENT BAGS Thus receivers must determine the following before attempting disposal

1. The number of days [illegible] the car has been under fumigation [illegible]
2. The approximate temperature the bags have been exposed [illegible] during the [illegible] of the fumigation

IF IT IS DETERMINED OR EVEN SUSPECTED THAT THE MINIMUM EXPOSURE REQUIREMENTS HAVE NOT BEEN MET *METHOD TWO MUST BE* [illegible]

A [illegible] with certain [illegible] determining exposure [illegible] Next [illegible] that contains [illegible] card showing the shipper [illegible] temperature [illegible] and card providing [illegible]

NOTE DO NOT TAKE CHANCES WITH DETIA GAS EX-B IF THERE IS ANY QUESTION THAT BAGS HAVE NOT MET THE MINIMUM EXPOSURE REQUIREMENTS SUCH BAGS MUST BE [illegible]

FIRST AID

SYMPTOMS OF HYDROGEN PHOSPHIDE (PHOSPHINE – PH3) POISONING

Sensation of cold
Pulling pains in the tongue [illegible] numbness
Diarrhea
Vomiting
Vertigo dizziness
Tinnitus
Anxiety state
Sensation of oppression in chest
Dry cough
Furred tongue coating on the tongue
Loss of appetite
Intense thirst
Dyspepsia acute indigestion
Gastric pains
Reeling – accompanied by [illegible]
Pains in limbs
Enlarged pupils
Choking attacks
Rapid onset of stupor

Any of the above may be taken as symptoms of phosphine poisoning At first warning or appearance that someone has been affected by phosphine *they must be taken to fresh air immediately call a doctor immediately* The patient should be laid down and kept warm with blankets Supply patient with pure oxygen and maintain respiration artificially if required Some symptoms may not appear for 24 hours

When the doctor arrives [illegible] the patient's actions nausea [illegible] Supply the doctor with proper first aid instructions [illegible] him in contact with nearest [illegible]

NOTE TO PHYSICIAN

Complete rest for patient [illegible] keep patient warm Intravenous [illegible] is normal practice if patient [illegible] and vomiting If [illegible] sugar solution [illegible] salt or Ringer's [illegible]

Inhalation of [illegible] tall [illegible] Stimulants [illegible]

In extremely serious cases of poisoning [illegible] transfusions are recommended *In the [illegible] cases must an antiacid use be [illegible] of [illegible] castor oil butter or milk*

Phosphine PH3 poisoning [illegible] phosphine action is to [illegible] disappearing [illegible]

GAS MASKS

[illegible] the pers[illegible] face[illegible] gas [illegible] designed for phosphine [illegible] approved by the U.S. Dept. of Interior [illegible] phosphine protection.

[illegible] B[illegible] garlic decayed fish or com[illegible] When a [redacted] odor is [illegible] gas masks immediately and [illegible] proper test [illegible]

After a [illegible] has been placed in the premises [illegible] has been reached [illegible] has been accomplished. Be[illegible] for presence of gas

[illegible] must be manufactured [illegible] used together. The [illegible] indicated their gas [illegible] the Bureau [illegible]

A[illegible] Equipment Co
[illegible] 084PHOV-R
B[illegible] Mines 14-F-[illegible]

[illegible] Appliance Co
[illegible] GMC-SS-1
B[illegible] Mines 14-F-61

Wilson Products Div. Ra[illegible]
[illegible] EGI
[illegible] Mines 14-F-68 [illegible] 14-F-69

GAS DETECTION EQUIPMENT

[illegible]

[illegible] Mines [illegible]

Research Products Company
1835 East North St., Salina, Kansas 67401
(913) 827-3665

RPC Bulletin No. 174

STOP

DO NOT ATTEMPT DISPOSAL OF DETTA GAS EX-B BAGS WITHOUT FIRST READING THE ENCLOSED INFORMATION.

NOTE TO USER OF DETIA GAS EX-B

This "STOP" envelope must accompany railcars, if they are being fumigated with Detia Gas Ex-B while in-Transit. It contains:

1. Disposal Instructions
2. First Aid Information
3. A General Information Card

The General Information Card provides the receiver with vital information! Be certain to provide all information requested in the "USER PORTION". Retain the original for your records.

RESEARCH PRODUCTS COMPANY
BOX 1057
SALINA, KANSAS 67401

(913) 827-3665

GENERAL INFORMATION CARD

USER PORTION

[illegible] shipping container [illegible]
[illegible] Delta Gas Ex-B as follows

Date _____ 19 ___, Time _____ AM _____ PM
With _____ Bags.

Temperature at time of bag placement _____ degrees F

Car Number _____

Shipper (User) _____

City _____ State _____

Certified Operator _____

RECEIVER PORTION -- FILL IN THE FOLLOWING BLANKS

Number of Delta Gas Ex-B Bags Removed

Date _____ 19 ___ Time _____ AM _____ PM

Temperature at time of removal _____ degrees F

BEFORE SELECTING DISPOSAL METHOD READ "DISPOSAL INSTRUCTIONS". BE CERTAIN MINIMUM EXPOSURE REQUIREMENTS HAVE BEEN DETERMINED FOR EXISTING CONDITIONS AND PROCEED ACCORDINGLY.

This is disposed of by Method One ( )
Method Two ( )

FOR FURTHER INFORMATION CONTACT:

[illegible]

ORIGINAL: FOR USER COPY: FOR RECEIVER