ACCEPTED

NOV 2 1981

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2548-59

EPA-PR

10-15-81

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS: DANGER

PHOSPHINE IS POISONOUS WITH AN ODOR ASSOCIATED WITH COMMERCIAL CARBIDE DO NOT BREATHE DUST OR FUMES• DO NOT USE 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 OR SIGNED FOR PHOSPHINE GAS APPROVED BY MESA/NIOSH OR THE U.S. BUREAU OF MINES FOR PHOSPHINE PROTECTION

ENVIRONMENTAL HAZARDS:

THIS PRODUCT IS TOXIC TO FISH. KEEP OUT OF LAKES, STREAMS AND OTHER AQUATIC ENVIRONMENTS. DO NOT CONTAMINATE WATER BY CLEANING EQUIPMENT OR DISPOSAL OF WASTES

PHYSICAL OR CHEMICAL HAZARDS:

DELTA GAS EX-B FUMIGANT POWDER IS NONCOMBUSTIBLE ITSELF, BUT EXPOSURE TO MOIST AIR OR WATER RELEASES FLAMMABLE AND TOXIC PHOSPHINE GAS SPONTANEOUS IGNITION MAY RESULT IF THE BAGS ARE CONTACTED BY WATER, ACIDS, OR OTHER CHEMICALS. 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 FEED BAGS OPEN TO ANIMALS. DURING APPLICATION AERATE ALL FUMIGATED PRODUCTS FOR AT LEAST 48 HOURS BEFORE OFFERING TO CONSUMERS

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

SYMPTOMS OF PHOSPHINE POISONING:

Vomiting, Dry Cough, Gastric Pain, Intense Thirst, Chesting Attacks, Sensation of Cold, Diarrhea, Dizziness, Loss of Appetite, Enlarged Pupils, Acute Indigestion, Fainting

Seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Delta Gas Ex-B is a aluminum phosphide preparation pre-packaged with special paper sachets (bags) which liberate poisonous phosphine gas (PH3) Hydrogen Phosphide once removed from the can and exposed to atmosphere and moisture. Delta Gas Ex-B is effective in preventing economic losses of certain insects infesting stored commodities.

The booklets "Instructions for Intransit Fumigation of Shipholds with Delta Gas Ex-B, Delta Pellets, and Delta Tablets", "Proper Handling, First Aid and Diagnosis of Delta Gas Ex-B, a Phosphine Fumigant", and "Delta Gas Ex-B Instruction Booklet" are a part of labeling. They contain specific use instructions concerning the fumigation of Listed Raw Agricultural Commodities, Animal Feeds, Stored Tobacco, Processed Foods, and Non-Food Products, information concerning dosage and exposure, and other information necessary to properly use Delta Gas Ex-B.

RESTRICTED USE PESTICIDE

For Retail Sale To And Use Only By Certified Applicators Or Persons Under Their Direct Supervision And Only For Those Uses Covered By The Certified Applicator's Certification

Delta GAS EX-B

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

KEEP OUT OF REACH OF CHILDREN

DANGER - POISON

STATEMENT OF PRACTICAL TREATMENT

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. IF SWALLOWED, CALL A PHYSICIAN OR POISON CONTROL CENTER. DRINK 1 OR 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING BACK OF THROAT WITH FINGER, OR, IF AVAILABLE, BY ADMINISTERING SYRUP OF IPECAC. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

See side panel for symptoms and additional precautionary statements.

CONTENTS	NET WT. EACH	TOTAL NET WT.
100 Active Bags (Normal Size)	34 grams	3400 grams (7.50 lbs.)
Gas protectant		300 grams

Manufactured by: Delta Freyberg, GMBH, P.O. Box 9 6945 Laudenbach, F.R. of Germany

Distributed by: Research Products Company, Box 1057 Salina, Kansas 67401

EPA REG. NO. 2548-59
EPA Est. No. 33962WG01

PAT. NO. 3 372,088

STORAGE AND DISPOSAL

STORAGE:

STORE OUT IN DRY, LOCKED, VENTILATED ROOM. PROTECT FROM MOISTURE, OPEN FLAMES, HEAT, ACIDS AND OTHER CHEMICALS. NEVER STORE NEAR HOMES OR LIVING QUARTERS. DO NOT REUSE CANS FOR ANY PURPOSE

PESTICIDE DISPOSAL

Pesticide or rinsate that cannot be used according to label instructions must be disposed of according to federal, state, or local procedures under the Resource Conservation and Recovery Act

DISPOSAL OF CANS: Dispose in a sanitary landfill or by other approved state or local procedures

DISPOSAL OF BAGS:

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

MINIMUM EXPOSURE REQUIREMENTS	
Below 40°F	Do not fumigate
40°F - 49°F	10 days (240 hours)
50°F - 59°F	5 days (120 hours)
60°F - 70°F	4 days (96 hours)
Above 70°	3 days (72 hours)

METHOD ONE: Collect bags and arrange for their transportation to a burial site or to a pesticide incinerator for burning.

METHOD TWO: Collect bags and transport them to an isolated 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 detergent or preferably a non ionic surfactant (2% by volume). Stir until all dust has settled. Arrange for transportation of the resulting slurry to a burial site.

Fumigated areas must be posted on all entrances with a sign containing at least the signal word DANGER and the "Skull & Crossbones" and the words "Area under fumigation, do not enter until completely aerated," the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

Certified Applicators Or Persons Under Their Direct Supervision And Only For Those Uses Covered By the Certified Applicator's Certification

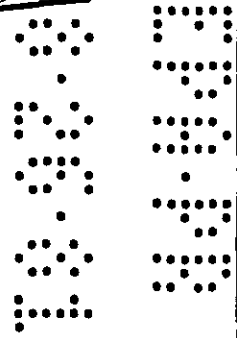
Detia®

GAS-EX B
INSTRUCTION BOOKLET

ACCEPTED

SEP 1 1 1981

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2548-59



EPA Registration No. 2548-59
EPA Establishment No. 33982WG01

RPC 8/81

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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 intransit) vaults, warehouses, static trailer vans (Not tarped grain trailers) barges, (static or intransit), ships (bulk carriers and tankers), shipping containers, and other sealable enclosures. Do not move trucks, vans, or trailers during fumigation. They must be completely aerated before movement is allowed. A fumigation consists of placing the bags in a specified manner once the facility being fumigated has been prepared. Minimum preparations consist of:

1. Sealing area or structure as gas tight as possible.
2. Posting of danger signs.
3. Being certain first aid information and proper respiratory equipment is at the site.
4. Being certain of the recommended application procedure.
5. 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:

(1) Add bags to grain stream as silos or bins are filled. Filling must be continuous. Determine addition 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.

(2) Bulk stored grain can sometimes be treated with a surface application of Detia Gas EX-B.

If a "yes" answer can be given to the following questions it may be feasible to use this technique.

(a) Can the fumigation be continued long enough to allow the gas to penetrate throughout the commodity?

(b) Can the storage structure be effectively sealed?

Consult Research Products Company for more information concerning these application procedures.

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 Container: Place and tape bags on rigid perforated cardboard with spacing between bags. Tape across the bag ends only. Specially designed discs or boards are available for this purpose from Research Products Company. If these devices are used taping is not necessary.

Place or fix the cardboard, bag-side up, inside the boxcar, 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 receiver with bag disposal instructions and first aid procedures. These are available from Research Products Company.

The booklets "Instructions for Intransit Fumigation of Shipholds with Detia Gas EX-B, Detia Pellets, and Detia Tablets", and "Proper Handling, First Aid and Disposal of Detia Gas EX-B, A Phosphine Fumigant" are a part of labeling. They contain specific use instructions concerning the fumigation of listed Raw Agricultural Commodities, Animal Feeds, Stored Tobacco, Processed Foods, and Non-Food Products; information concerning dosage and exposure, and other information necessary to properly use Detia Gas EX-B.

DANGER SIGNS

Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the Skull & Crossbones and the words "Area under fumigation, do not enter until completely aerated," the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

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 basic dosage is 3 bags per 1000 cubic feet.

DOSAGE RANGE: 2-6 Bags Per 1000 Cubic Feet

RAW AGRICULTURAL COMMODITIES

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans, Cocoa Beans, Coffee Beans (raw), Filberts, Pecans, Pistachio Nuts, Walnuts, Cashews, Brazil Nuts, Almonds, Peanuts, Sunflower Seed, Cotton Seed, Safflower Seed, Seed and Pod Vegetables (Adzuki Red Beans, Blackeye Peas, Garbanzos Beans, Great Northern Beans, Green Split Peas, Lentils Peas, Lima Beans, Michigan Navy Beans, Moth Beans, Mung Beans, Pinto Beans, Split Urds), Sesame Seed, Grass Seed, Flower Seed, Vegetable Seed, Dates.

PROCESSED FOODS

Cereal Flours and Milled Fractions, Soybean Flour and Milled Fractions, Polished Rice, Brewers Rice Grits, Macaroni, Spaghetti, Noodles, Paste, Malt (processed grains), Bakery Mixes, Packaged Cereals, Pretzels, Oat Meal, Spices, Whole Wheat, Cream of Wheat, Processed Coffee/Tea (roasted-dried), Prepared Cocoa, Dried/Processed Meat-Fish-Cheese, Seasoning, Condiments (ground), Cookies, Crackers, Snack Foods, Herbs, Sugars-Candy Bars-Candy, Nondairy Creamers, Dried Powdered Milk, Nuts-Processed, Dehydrated Potato Products, Dried Fruits, Dried Spinach, Dried Carrots, Dried Eggs, Apricot Kernels, Primary Yeast, Dates, Figs, Prunes, Raisins, Saltanas, Dried Peas, Dried Beans, Dried Lentils.

Animal Feed or Feed Ingredients

NON-FOOD PRODUCTS

Cotton, (cloth and unprocessed) Feathers, Human Hair, Rubberized Hair, Vulcanized Hair, Moe Hair, Wool, Tobacco, Wood and Bamboo Products.

TOBACCO:

Tobacco Temperature ABOVE 60°F

Temperature	Dosage: Bags/1000 Cubic Feet	Minimum Exposure
Above 68°F	2	4 days
60°F-68°F	2	6 days
Post Fumigation Aeration:	Hogsheads	3 days minimum
	Other	2 days minimum

Tobacco Temperature: 40°F-59°F

For Kill of Cigarette Beetle Larvae

Temperature	Dosage: Bags/1000 Cubic Feet	Minimum Exposure
40°F-59°F	2	See page 4

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Best results are achieved when tobacco is fumigated at temperatures above 60°F. However, where it is not possible to achieve these temperatures, fumigation 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 these lower temperatures. The appropriate exposure periods for fumigation of tobacco are:

50°F-59°F.....168 hours
40°F-49°F.....336 hours

NOTE: Warehouses and containers must be tightly sealed.

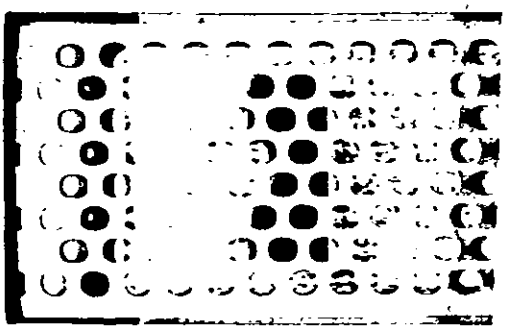
Post fumigation aeration time is a minimum of 4 days.

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

RESEARCH PRODUCTS COMPANY
P.O. Box 1057
1835 East North Street
Salina, Kansas 67401

Telephone: (913) 825-2181

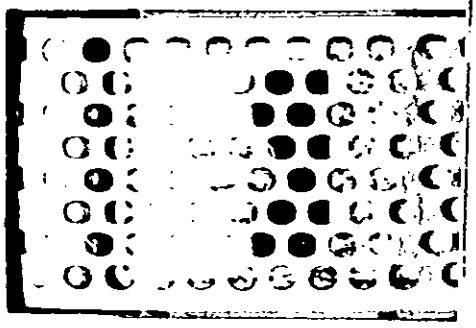
6115

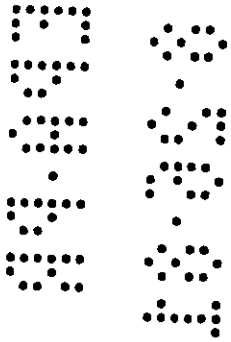


ACCEPTED

SEP 1 1 1981

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2596-59





2548-59
PM-3

PROPER HANDLING, FIRST AID AND DISPOSAL OF

Detia GAS EX-B A PHOSPHINE FUMIGANT

RESTRICTED USE PESTICIDE

For Retail Sale To And Use Only By Certified Applicators Or Persons Under Their Direct Supervision And Only For Those Uses Covered By The Certified Applicator's Certification

EPA REGISTRATION NO. 2548-59

EPA ESTABLISHMENT NO. 33982WG01

ACCEPTED

SEP 1 1 1981

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INTRODUCTION

This bulletin has been prepared by Research Produ
Company, distributor for Detia Gas Ex-B, in the inter
of educating users with respect to the proper handl
of Detia Gas Ex-B as well as providing specific techni
information.

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

Needless to say, Detia Gas Ex-B is a poisono
fumigant. When used properly, it is effective to o
degree or another. It is designed to accomplish speci
objectives when used in a prescribed manner. And,
can be mis-used which could lead to situations th
might be potentially harmful to man.

It is the intent of Research Products Company to p
vide information via this bulletin which will be benefic
in the thorough training of users. All potential use
should read this bulletin in combination with oth
literature and instruction provided by Research P
ducts Company.

WHAT IS DETIA GAS EX-B

It is a fumigant utilizing a packaging concept that permits the easy use of aluminum phosphide on a wide range of commodities for the control of certain insect pests. The packaging concept is important to users as it allows 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 releasing 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 vacuum. The combination of high molecular activity,vapor pressure and toxicity to insects accounts for its world-wide acceptance as a fumigant. Additionally, phosphine does not present the residue problems inherent with other commercially used fumigants. Residual tolerances have been established at 0.1 ppm for raw agricultural commodities and 0.01 ppm for specified processed foods.

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PHYSICAL CONSTANTS

Chemical Formula	PH_3
Molecular Weight	34.04
Vapor Pressure 70 deg. F	545 PSIG
Specific Volume 70 deg. F., 1 atm	10.5 cu. ft./lb.
Boiling Point 1 atm	-124.9 deg. F.
Freezing Point 1 atm	-207.4 deg. F.
Density 32 deg	1.529 g/l
Density, Liquid (194 deg. F., 90 deg. C)	0.746 g/ml
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/m³) 17,000 to 18,900 PPM

Threshold Limit Values
Maximum Allowable Concentration (8 hr. working day) = 0.3 PPM

Reference: International Critical Tables – Pages 3, 4, 8, 22, 29, 116, 180, 189, 213, 228, 229, 248, 259, 260

*Pure hydrogen phosphide can undergo spontaneous heating and ignition if confined to the point that a rather heavy concentration in air is reached. The lower limit has been established at 1.79% be volume in air, or, 17,900 ppm. The highest recommended use levels of Detia Gas Ex-B are as below the lower limit.

ABOUT THE BAG

It is more than a 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 total 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:

34 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.

An aluminum phosphide preparation, such as found with Detia Gas Ex-B, expands during the process of absorbing atmospheric moisture (to release phosphine). The crepe design of the bag permits this expansion

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without, fear of rupture. Additionally the bags are carefully sewn to prevent leakage at the seams. The expandability feature, along with the closing technique, prevents the contamination of the product.

Normal bags are packed either 6, 10, or 100 to a can and Long Narrows, 15. The basic dosage for Detia Gas Ex-B is 3 bags per 1000 cubic feet. Thus, the packaging differential permits a wide combination of useful selection. The metal cans are hermetically sealed and are easily opened with a common strip key. Each can contains a secured gas-absorbing pouch that serves to absorb any loose hydrogen phosphide liberated between filling and packing.

WHERE CAN DETIA GAS EX-B BE USED

It is especially suited, but not limited, to commodity fumigation in space: box cars, bulk rail cars, vaults, warehouses, trailer vans, commodities under tarp, bulk commodity bins, barges, shipholds, buildings or any structure that can be sealed gas tight.

Do not move trucks, vans or trailers during fumigation. They must be completely aerated before movement is allowed.

The Long Narrow bags and the Normal bags – 100 per can – are particularly well adapted to flat stored bulk grain. An eyelet in the LN bag permits easy insertion into grain by means of a special probe. The 100 normal bags are prepackaged in a long fabric strip allowing it to be rolled out on grain or other surface and easily removed. Normal bags may be added directly to grain as bins or silos are filled. In either case it would be 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, tobacco, and non food commodities.

A list of approved commodities is shown below.

Raw Agricultural Commodities

Rice	Pistachio Nuts	Vegetables:
Wheat	Walnuts	Adzuki Red Beans
Barley	Cashews	Blackeye Peas
Corn	Brazil Nuts	Garbanzos Beans
Oats	Almonds	Great Northern Beans
Sorghum	Peanuts	Green Split Peas
Millet	Dates	Lentils Peas
Rye	Grass Seed	Lima Beans
Popcorn	Flower Seed	Michigan Navy Beans
Soybeans	Vegetable Seed	Moth Beans
Cocoa Beans	Sunflower Seed	Mung Beans
Coffee Beans (raw)	Cotton Seed	Pinto Beans
Filberts	Safflower Seed	Split Urds
Pecans	Seed and Pod	Sesame Seed

Processed Foods

Cereal Flours and Milled Fractions	Cream of Wheat	Nondairy Creamers
Soybean Flour and Milled Fractions	Processed Coffee/Tea (roasted-dried)	Dried Powdered Milk
Polished Rice	Prepared Cocoa	Nuts-Processed
Brewers Rice Grits	Dried/Processed Meat-Fish-Cheese	Dehydrated Potato Products
Macaroni	Seasoning	Dried Fruits
Spaghetti	Condiments (ground)	Dried Spinach
Noodles	Cookies	Dried Carrots
Pasta	Crackers	Dried Eggs
Malt (processed grains)	Snack Foods	Apricot Kernels
Bakery Mixes	Dried Peas	Primary Yeast
Packaged Cereals	Dried Beans	Dates
Pretzels	Dried Lentils	Figs
Oat Meal	Herbs	Prunes
Spices	Sugars-Candy	Raisins
Whole Wheat	Bars-Candy	Saltanas
		Animal Feed or Feed Ingredients

Non-Food Products

Cotton (cloth and unprocessed)	Rubberized Hair	Tobacco
Feathers	Vulcanized Hair	Wood and Bamboo Products
Human Hair	Moe Hair	
	Wool	

The registered use of Detia Gas Ex-B is in a continual process of expansion as research and development proceeds. From time to time the above list will be expanded to include other goods and commodities.

Detia Gas Ex-B is used for the control of certain insect pests listed below:

Granary Weevil *Sitophilus granarius (L.)*
Rice Weevil *Sitophilus oryzae (L.)*
Lesser Grain Borer *Rhizopertha dominica (F.)*
Saw-toothed Grain Beetle *Oryzaephilus surinamensis*
Confused Flour Beetle *Tribolium confusum (Duv.)*
Indian Meal Moth *Plodia interpunctella*
Yellow Meal Worm *Tenebrio molitor (L.)*
Red Flour Beetle *Tribolium castaneum (Herbst)*
Spider Beetles *Ptinidae*
Hairy Fungus Beetle *Typhaea stercorea (L.)*
Mediterranean Flour Moth *Anagasta (Ephestia) kuehniella*
Bean Weevil *Acanthoscelides obtectus (Say)*
Cigarette Beetle *Lasioderma serricorne (F.)*
Tobacco Moth *Dephestia elutella (Hubner)*
Angoumois Grain Moth *Sitotroga cerealella (Oliv)*
Cadelle *Tenebroides mauritanicus (L.)*
Khapra Beetle *Trogoderma granarium (Ev.)*

HOW IS DETIA GAS EX-B USED

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

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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 underdose. 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 should never be used in such a manner as to allow the build-up of gas whereby the concentration would reach the lower ignition level of 1.79% by volume. Recommended dosage levels are far below that required to reach the limit.

Contact with water or other liquids causes spontaneous heating and spontaneous ignition of the evolved gas unless the following are observed. Do not use bags that have been exposed to water or other liquids in any way. Do not use bags where they are liable to come in contact with water or other liquids. Do not use bags that have been damaged in any way. Do not wrap, cover or confine used or unused bags in air tight materials. Do not have bags contact each other—use bags individually with spacing in between.

4. The release of phosphine from Detia Gas Ex-B is controlled by design. The release begins slowly and will gradually build 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 vaselin on contact points or totally wrapping devices with heavy polyethylene film.

STORAGE AND HANDLING PRECAUTIONS

Detia Gas Ex-B is packaged in hermetically sealed cans. As long as cans are not opened, the shelf life is practically unlimited. Detia Gas Ex-B should be stored in 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 and precautions found on the label, be certain to:

Study the recommended application procedure.

Notify local authorities where applicable.

Only personnel properly trained in the use of Detia Gas Ex-B should conduct fumigations.

First aid equipment and information should be readily available.

Proper respiratory equipment should be readily available for each operator.

The area to be fumigated should be adequately posted with danger signs.

In most cases adjoining facilities should be evacuated and properly posted with danger signs.

Always work in pairs, never alone.

It is advisable to open cans in open air.

Never smoke or eat while handling the bags.

Always wash hands after handling the bags.

Never attempt to save 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.

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MINIMUM EXPOSURE REQUIREMENTS

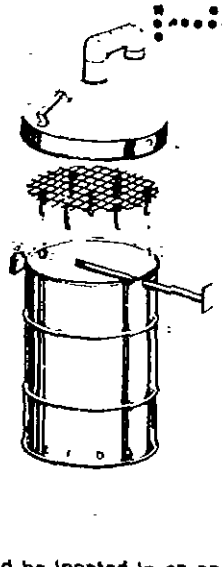
Below 40° F ..... Do not fumigate
40°-49° F ..... 14 days (336 hours)
50°-59° F ..... 7 days (168 hours)
60°-77° F ..... 4 days (96 hours)
Above 77° F ..... 3 days (72 hours)

METHOD ONE: Collect bags and arrange for their transportation to a burial site or to a pesticide incinerator for burning.

METHOD TWO: Collect bags and transport them to an isolated 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, carrel, etc.) containing a mixture of water and detergent of preferably a non-ionic surfactant (2% by volume). Stir until all dust has settled. Arrange for transportation of the resulting slurry to a burial site.

In lieu of immediate method one 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.

Note the cone shape, vented lid as well as the expanded metal false floor, the 10x1" diameter hole evenly spaced around the bottom, the 5x1" diameter holes in the bottom (not shown) and the locking device. The purpose of the drum is to provide a central, known collection point for bags. When full or at regular intervals the spent bags can be transported directly to an approved disposal site.



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.

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 or hours the car has been under fumigation, and –

2. The approximate temperature the bags have been exposed to during the duration of the fumigation.

IF IT IS DETERMINED OR EVEN SUSPICIONED THAT THE MINIMUM EXPOSURE REQUIREMENTS HAVE NOT BEEN MET METHOD TWO CAN BE USED OR THE BAGS CAN BE PLACED IN A DISPOSAL DRUM WHICH IS LOCATED IN A SECURE PLACE AWAY FROM BUILDINGS.

As an aid to receivers, users have been provided with certain aids to use that assist receivers in determining exposure history. Namely a brochure that contains disposal instructions and first aid information.

FIRST AID

SYMPTOMS OF HYDROGEN PHOSPHIDE (PHOSPHINE – PH_3) POISONING:

Sensation of cold
Pulling pains in the region of the diaphragm and 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 vomiting
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 do not appear for 24 hours.

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When the doctor arrives, advise him as to the patient's actions – nausea or vomiting, etc. Supply the doctor with proper first aid instructions or put him in contact with nearest poison control center.

If swallowed call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of ipecac. Do not induce vomiting or give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN

Complete rest for patient: 1-2- days – no activity – keep patient warm. Intravenous glucose injections (as normal practice) if patient suffers from nausea and vomiting. If, however, an increase in the bloodsugar is found, isotonic salt solutions (physiological salt – or Ringer's solution *without glucose*)must be injected instead.

Inhalation of oxygen or oxygen/carbon dioxide is usually successful. Use of cardiac and circulatory stimulants normally advisable.

In extremely serious cases of poisoning, blood transfusions are recommended. *In no circumstances must an antidotal use be made of fats, oils (castor oil), butter or milk.*

Phosphine (PH$_3$) poisoning is not chronic; phosphine action is reversible and symptoms will disappear by themselves.

GAS MASKS

It is normally not necessary to actually wear a gas mask when fumigating with Detia Gas Ex-B. However, always have on the person a "full faced" gas mask, fitted with a canister designed for phosphine gas only, approved by MESA/NIOSH or the U.S. Bureau of Mines, for phosphine protection.

Detia Gas Ex-B has a garlic, decayed fish or commercial carbide odor. When a strong odor is detected, put on gas masks immediately and determine the concentrations with proper test equipment before proceeding.

After all bags have been placed and the premises have been locked and sealed, do not re-enter until the required exposure period has been reached and complete aeration has been accomplished. Be certain to test the atmosphere for presence of gas.

Gas masks and canisters must be manufactured by the same company and used together. The following manufacturers have indicated their gas masks and canisters are approved by the Bureau of Mines for phosphine protection up to .5% by volume in the area.

Acme Protection Equipment Co.
Canister 084PHOV-R
Bureau of Mines 14-F-70

Mine Safety Appliance Co.
Canister #77713 GMC-SS-1
Bureau of Mines 14-F-61

Wilson Products Div. Ray-O-Vac Co.
Canister LG10
Bureau of Mines 14-F-68 or 14-F-69