

**RESTRICTED USE PESTICIDE DUE TO INHALATION TOXICITY**

For 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.



# ZYTHOR

05/10/13

Use to control existing infestations of all life stages of listed pests such as drywood termites, beetles (old house borer, powderpost, deathwatch), bedbugs, clothes moths, German cockroaches and rodents (rats, mice). Use to control existing infestations of non-egg life stages only of insects such as dermestid beetles (furniture carpet, carpet) and cockroaches (oriental, American, brown-banded). Use to control existing infestations of above ground Formosan termites.

For use in disinfecting structures such as dwellings, buildings, warehouses, mobile homes. For use in disinfecting vehicles such as automobiles, buses, recreational vehicles, surface ships, shipping containers, rail cars, (except aircraft). For use in disinfecting materials (construction) and furnishings (household effects).

When using, observe local, state and federal rules and regulations concerning the use of warning agents, detection devices, respiratory protection, protective clothing, security requirements and posting of warning signs.

**ACTIVE INGREDIENT**

Sulfuryl fluoride..... 99.3%

**OTHER INGREDIENTS**..... 0.7%

**TOTAL**..... 100.0%

**KEEP OUT OF REACH OF CHILDREN**

**DANGER**  **POISON**  
**PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)  
In case of emergency endangering health or the environment involving ZYTHOR, call 1-800-369-4352.

**Manufactured for: Ensysstex II, Inc.**  
**2175 Village Drive, Fayetteville, NC 28304 USA**

**FIRST AID**

In all cases of overexposure, when symptoms such as nausea, difficulty in breathing, abdominal pain, slowing of movements and speech or numbness in extremities are exhibited, get medical attention immediately. Take affected person to a doctor or emergency treatment facility.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**If liquid is on skin or on clothing:** Immediately apply water to contaminated area of clothing before removing. Once area has thawed, remove contaminated clothing, shoes and other items covering skin. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If liquid is in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Liquid fumigant in the eye may cause damage due to refrigeration or freezing. Call a poison control center or doctor for treatment advice.

**HOT LINE NUMBER**

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. You may also call 1-800-424-9300 for emergency medical treatment information.

**NOTE TO PHYSICIAN**

ZYTHOR is a gas that has no warning properties such as odor, color or eye irritation. (Chloropicrin, which is used as a warning agent in conjunction with ZYTHOR, is the active ingredient in tear gas and will cause tearing.) Early symptoms of exposure to ZYTHOR are respiratory irritation and central nervous system depression. Excitation may follow. Slowed movement, reduced awareness and slow or garbled speech may be noted. Prolonged exposure can produce lung irritation, pulmonary edema, nausea and abdominal pain. Repeated exposure to high concentrations can result in significant lung and kidney damage. Single exposures at high concentrations have resulted in death. Treat symptomatically.

**READ THIS ENTIRE LABEL BEFORE USING THIS PRODUCT. ALL PARTS OF THIS LABEL ARE EQUALLY IMPORTANT FOR SAFE AND EFFECTIVE USE OF THIS PRODUCT. AS NECESSARY, CONSULT WITH THE LEAD STATE PESTICIDE REGULATORY AGENCY TO DETERMINE OR REMAIN INFORMED OF THE CURRENT REGULATORY STATUS, REQUIREMENTS AND RESTRICTIONS CONCERNING THE USE OF THIS PRODUCT FOR FUMIGATION IN THE STATE OF INTENDED USE. CALL ENSYSTEX II, INC. (PHONE 1-866-367-8467) IF YOU HAVE ANY QUESTIONS OR DO NOT UNDERSTAND ANY PART OF THIS LABEL.**

**APPLICATION PERSONNEL MUST PARTICIPATE IN ENSYSTEX II'S ZYTHOR TRAINING AND STEWARDSHIP PLAN**

**THE ZYTHOR APPLICATOR'S MANUAL IS PART OF THE LABELING FOR ZYTHOR.**

**Notice:** Before buying or using this product, read "Terms and Conditions of Use", "Warranty Disclaimer", "Inherent Risks of Use" and "Limitation of Remedies" sections of this label. If terms are unacceptable, return at once unopened.

**EPA Reg. No. 81824-1**

**NET CONTENTS: See container**

Zythor is a registered trademark of Ensysstex II, Inc.

## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

**DANGER**  
**PELIGRO**



**POISON**

**Extremely Hazardous Liquid And Vapor Under Pressure • Fatal If Inhaled • May be Fatal if Swallowed • Causes Irreversible Eye Damage • Contact with Liquid Causes Freeze Burns Of Exposed Skin**

**Do not get in eyes, on skin or on clothing. ZYTHOR is odorless and colorless. Exposure to toxic levels may occur without warning or detection by the user or exposed persons.**

#### Protective Clothing

Wear splash resistant goggles or full face shield for eye protection during introduction of fumigant or when working around any lines containing fumigant under pressure. Do not wear gloves or rubber boots. Do not reuse clothing or shoes that have become contaminated with liquid fumigant until they have been thoroughly aerated and cleaned. Splash resistant goggles are defined as goggles designed and made of material that allows no measurable movement of the liquid pesticide being used to pass through them during use.

#### Respiratory Protection

Use of an approved Respiratory Protection Device (see *Respiratory Protection Devices*) is required to enter or remain within a fumigated space anytime the concentration of ZYTHOR within the breathing zone of that space is known to exceed 1 ppm or is unknown, such as at the start of the aeration process. Breathing zones are defined as areas within the fumigated structure where individuals typically stand, sit or lie down.

If the concentration of ZYTHOR within the breathing zone of the fumigated space, as measured by an approved and properly calibrated Low Fumigant Level Detection Device (see *Low Fumigant Level Detection Devices*), does not exceed 1 ppm, no respiratory protection is required to enter or remain within the fumigated space. Because the approved detection devices give immediate readings of the levels of fumigant present, respiratory protection is not required when these devices are in use after the initial 1 hour aeration procedure is completed. However, whenever a fumigant level reading exceeding 1 ppm is obtained within the breathing zone of a fumigated space, anyone within the fumigated space not using an approved Respiratory Protection Device must immediately leave the fumigated space and remain outside the fumigated space until fumigant level readings of 1 ppm or greater are no longer obtained within the breathing zone of the fumigated space. The fumigated space must remain posted until cleared for re-occupancy. Refer to the Zythor Applicator's Manual for further details.

#### Respiratory Protection Devices

Use a NIOSH or MSHA approved positive pressure Self-Contained Breathing Apparatus (SCBA, not SCUBA) or combination air supplied/SCBA respirator, such as those manufactured by Ranger, Survivair, Scott, or MSA, when respiratory protection is required (see *Respiratory Protection*). Required Respiratory Protection Devices must be on site and operational before an application of ZYTHOR begins.

Before using any make or brand of Respiratory Protection Device, learn how to use it correctly. Determine that it is in good working order, that it has an air supply sufficient to supply air for the period of time the device will be in use, that it fits properly and that it provides an adequate seal around the face.

#### Low Fumigant Level Detection Devices

As part of the aeration/clearance process or cylinder leak procedure, an approved Low Fumigant Level Detection Device capable of confirming a concentration of ZYTHOR of 1 ppm or less, such as the SPECTROS SF-ExplorIR, INTERSCAN or MIRAN gas analyzers, should be used to sample the air within the breathing zone of the fumigated space to confirm the level of fumigant, if any, that is still present. The INTERSCAN gas analyzer must be calibrated within one month prior to its use as a Low Fumigant Level Detection Device. All other approved Low Fumigant Level Detection Devices must be calibrated according to their manufacturer's recommendations.

## ENVIRONMENTAL HAZARDS

Sulfuryl fluoride is highly toxic to fish and wildlife. Avoid exposure to non-target organisms.

## PHYSICAL AND CHEMICAL HAZARDS

Sulfuryl fluoride is a colorless, odorless, non-irritating toxic gas. ZYTHOR cylinders are under pressure and must not be stored near heat or open flame. Exposure of the cylinder(s) to temperatures above 158°F will cause a fusible plug in the valve body to melt and the contents to be released into the atmosphere. Under high heat conditions (temperatures above 752°F), ZYTHOR can decompose into sulfur dioxide (SO<sub>2</sub>), hydrofluoric acid (HF) and other decomposition products. Hydrofluoric acid is highly reactive and can corrode or damage many materials including metals, glass, ceramic finishes, fabrics, etc.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Do not ship or store with food, feed, drugs or clothing.

**Pesticide Storage:** Store in a dry, cool, well ventilated area under lock and key. Post as a pesticide storage area. Store cylinders upright, secured to a rack or wall to prevent tipping. Storage of ZYTHOR in occupied buildings and spaces is prohibited unless storage area(s) is equipped with either 1) a permanently mounted and properly maintained and functioning sulfuryl fluoride monitoring device designed to alert occupants of the building to the presence of sulfuryl fluoride in the air of the storage area at a level greater than 1 ppm or 2) a continuously operating forced air ventilation system that meets all applicable ordinances pertaining to the storage of hazardous materials.

**Cylinder Return:** Refillable container. When cylinder is empty, close valve, screw safety cap onto valve outlet and replace protection bonnet. Follow registrant's instructions for return of empty or partially empty cylinders. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Always follow the proper cylinder handling directions.

**Pesticide Disposal:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide is a violation of Federal law. If the wastes cannot be disposed of by use according to label instructions, consult your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Carefully read and follow all Directions For Use. **The Zythor Applicator's Manual is part of the labeling for Zythor.**

ZYTHOR is a highly hazardous material and must be used only by individuals trained in its proper use and knowledgeable of its possible hazards. All local, state and federal rules and regulations regarding security requirements, reentry, aeration, clearance, posting of warning signs and use of detection devices, warning agents and respiratory protection equipment must be observed when fumigating with ZYTHOR.

Do not apply this product without first computing the dose to be applied with the Fumicalc software program. The Fumicalc program, which is available from Ensystex II, Inc., is part of the labeling for this product and must be used to calculate any dose of ZYTHOR.

Two persons trained in the use of ZYTHOR, at least one of whom is an applicator licensed/certified to perform fumigations by the state in which the application is being performed, must be present on site during any release of ZYTHOR, during any reentry into the fumigated space within the exposure period and during initiation of the initial aeration procedure. Two persons, however, need not be present if monitoring is conducted remotely (outside the area being fumigated) and no one enters the fumigated space.

If fumigating for insect pests, do not apply ZYTHOR when the lowest temperature at a site of pest activity within the fumigated space is below 40°F. Generally, the lowest temperature in a slab structure is found at the slab foundation and the lowest temperature in a crawl space structure is found just below the surface of the crawl space soil. No temperature restriction applies when fumigating for rodents.

Remove, food, feed, drugs (including tobacco products) and medicinals from the structure before the fumigation if they cannot be protected against exposure to ZYTHOR (see *Preparation for Fumigation*). Chloropicrin must be used to warn of the presence of fumigant within the fumigated space (see *Warning Agent*).

#### Handling and Transportation of Cylinders

Cylinders must not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging or sliding. Do not use rope, slings, hooks, tongs or similar devices to unload or move cylinders. Transport cylinders using a hand truck or fork truck to which the cylinder can be firmly secured. Do not transport any cylinders in closed vehicles where they occupy the same common airspace as personnel. Transport cylinders securely and only in an upright position. ZYTHOR cylinders should never be transported by aircraft under any circumstances.

Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap and valve protection bonnet as soon as practical after use.

The cylinder valve is designed to retain a small amount of fumigant within the cylinder when the pressure within the cylinder falls below a certain pressure. This feature prevents the introduction of unauthorized substances into the cylinder when it is empty. This is facilitated by a spring loaded residual pressure feature incorporated into the valve that cuts off gas flow when the pressure of the remaining gas falls below a certain low level. Do not attempt to defeat this mechanism as serious injury could result.

#### Cylinder Leak Procedure

Evacuate immediate area of leak. Use an approved Respiratory Protection Device (see *Respiratory Protection Devices*) for entry into affected areas to correct the problem. Move leaking or damaged cylinder outdoors or to an isolated location, observing strict safety precautions. Work upwind from the cylinder if possible. Entry into the affected area by persons not using approved Respiratory Protection Devices is not permitted until the concentration of ZYTHOR in the breathing zone of the affected area is determined to be 1 ppm or less, as determined by an approved Low Fumigant Level Detection Device (see *Low Level Fumigant Detection Devices*). Refer to the Zythor Applicator's Manual for further details.

#### Compressed Gas Hazards

The release of fumigant under high pressure can be forceful, creating a potential for personal injury.

A fog-out can occur if ZYTHOR is released too rapidly. The chances of this condition occurring may be decreased by following the instructions contained in this label (see *ZYTHOR Release Preparation*).

The rapid discharge of ZYTHOR through introduction equipment will result in the cooling of parts of the equipment and the cylinders. Contact with the cooled equipment can cause frostbite.

## PREPARATION FOR FUMIGATION

### Structure Occupant Fact Sheet

Prior to the application of ZYTHOR to a structure, the ZYTHOR Fact Sheet must be provided to an adult occupant of the structure to be fumigated. In the case of a multi-unit or connected structure (see below), the ZYTHOR fact sheet must be provided to an adult occupant of each currently occupied individual living unit within these structures.

### Fumigating Part(s) of a Structure (including Portions of a Multi-unit Structure)

When fumigating unit(s)/room(s) that are a part of or are within a larger structure (such as one or more units of a town house, apartment or condominium building/complex) the space within all units/rooms of the entire structure must be considered to be fumigated space with respect to all requirements concerning structure entrance security, posting, evacuation, reentry, aeration and clearance. Chloropicrin needs to be used only within the fumigated units/rooms of the structure. If during clearance the concentration of Zythor in the breathing zone of a unit/room is discovered to be greater than 1 ppm, ventilate the unit/room by opening operable doors and windows and continue to measure the concentration of Zythor in the breathing zone until it is 1ppm or less. Structure may be reoccupied when concentrations of Zythor in the breathing zones of all units/rooms in the structure is 1 ppm or less. Breathing zones are defined as areas within the units/rooms where individuals typically stand, sit or lie down.

### Fumigating Connected Structures

A connected structure or area is defined as any structure or area connected to or having in common with the space to be fumigated any construction elements (e.g. pipes, conduits, ducts, cavities, voids, etc.) which could possibly allow the passage of fumigant out of the fumigated space into the connected structure(s) or area(s).

If state rules and regulations do not permit the continued occupancy of a structure or area connected to a structure that is being fumigated during the fumigation process, the space within the entire connected structure(s) or area(s) must be considered to be a fumigated space with respect to all requirements concerning structure entrance security, posting, evacuation, reentry, aeration and clearance. If the continued occupancy of connected structures is permitted during fumigations by state rules and regulations and continued occupancy of connected structures will occur during the fumigation process, adhere to the procedures contained within the state rules and regulations for isolating the connected structure(s) from the fumigated space before allowing for such occupancy to occur. Chloropicrin needs to be used only within the fumigated space. Concentration levels of Zythor must be measured in the breathing zones in any connected structure(s) or area(s) to confirm concentrations are 1 ppm or less before the structure(s)/area(s) can be reoccupied.

### What to Remove from the Fumigated Space

Remove all persons, domestic animals, pets and desirable growing plants from the space to be fumigated. Remove mattresses (except waterbeds) and pillows completely enveloped in waterproof covers or alternately remove or unseal / unzip covers.

Food, feed, drugs (including tobacco products) and medicinals (including those items in refrigerators and freezers) can remain within the fumigated space if they are contained within plastic, glass or metal containers with the original manufacturer's air-tight seal intact.

Remove fish tanks containing live fish, or remove the fish, or develop a plan for preparing the tank for fumigation. If necessary, exclude water in the tank and biological filters, if present, from the fumigated space by sealing with gas resistant tarps or sheeting. If water aeration is required during the fumigation, provide fresh air from outside the fumigated space for the tank aerator.

### Protective Bagging of Open Food, Feed and Drugs

Food, feed, drugs (including tobacco products) and medicinals (including those items in refrigerators and freezers) not in plastic, glass or metal containers with the original manufacturer's air-tight seal intact must be removed from the fumigated space or protected against exposure to ZYTHOR if they are left within the fumigated space.

Items can be protected against exposure to ZYTHOR by double bagging them in Fumiguard, Nylofume® or Master Fume® bags. Fumiguard bags, which are available from Ensystex II (and Nylofume and Master Fume bags) are made of a material highly resistant to permeation from gases such as sulfuranyl fluoride. Double bag in Fumiguard, Nylofume or Master Fume bags all items that must be protected against exposure to ZYTHOR that will be left within the fumigated space. Double bagging is performed by placing an item in a Fumiguard, Nylofume or Master Fume bag, twisting the top of the bag closed tightly and then securing the twisted part of the bag in its closed position. The closed bag is then double bagged by placing the closed bag inside another bag which is secured closed in the same manner as the inner bag.

### Extinguishing Flames and Disconnecting Heat Sources

Extinguish all flames, including pilot lights of furnaces, water heaters, dryers, gas refrigerators, gas logs, ranges, ovens, broilers, open flames, etc. Turn off or unplug all electrical heating elements such as those in heaters, dryers, pianos, organs, etc. Shut off automatic switch controls for appliances and lighting systems that will be contained within the fumigated space. Contact your local gas company to determine what procedures should be followed in your area for shutting off natural gas or propane service. Gas service must be shut off at the main service valve. Sulfuryl fluoride can react with strong bases such as some photo developing solutions.

### Doors and Openings to Closed Spaces

Open and leave open all operable internal doors. Open and leave open all operable openings to rooms, attics, sub-areas, storage rooms and closets. Open and leave open operable doors, covers or lids of any space within which fumigant could accumulate and linger during aeration including storage cabinets, drawers, storage chests and appliances (such as washers, dishwashers, dryers, microwave ovens, conventional ovens, refrigerators, freezers, etc.).

### Appliances

Turn off and/or disconnect appliances as appropriate to the circumstances. Alternately leave refrigerators and freezers operating and their doors closed if the choice is made to leave properly sealed items inside of them. If the choice is made to leave sealed items in closed refrigerators and freezers during the exposure period, the appliance's doors must be opened and left open at some point during aeration and clearance of the fumigated space until the concentration of ZYTHOR within their interior is 1 ppm or less as measured by an approved and properly calibrated Low Fumigant Level Detection Device.

### Air Circulation

Based on the circumstances, it may be necessary to actively circulate the air in all or part of the fumigated space with properly positioned fans after the release of ZYTHOR to assure its rapid dispersion within all of the fumigated space. Parts of the structure that

may warrant consideration for active air circulation may include basements, dead air spaces and areas located long distances from a point of ZYTHOR introduction into the fumigated space. If possible, position and aim fans in such a manner that air closer to the point(s) of ZYTHOR release is circulated towards points farther from the point(s) of ZYTHOR release.

### Fumigant Confinement

The methods and materials used to confine the fumigant to a space to be fumigated can vary depending on the nature of the space (e.g., structure, vehicle, chamber, vessel) and the inherent resistance of the surfaces that form the space to the movement of the fumigant out of it (e.g., masonry walls vs. wood walls). The more gas tight the fumigated space inherently is or can be rendered to be, the higher the level of fumigant confinement that can be attained. Consider a monitored application of ZYTHOR (see *Monitored Vs. Un-Monitored Application*) to any fumigated space where there is uncertainty as to whether or not an adequate level of ZYTHOR can be confined to that space for the intended duration of the exposure period.

### Structure Fumigation Using A Tarpaulin

When and to the extent needed, use tarpaulin(s) made of a material that effectively confines and is sufficiently impermeable to the passage of the fumigant through it such as vinyl coated nylon or polyethylene sheeting of at least 4 mil thickness to cover the structure or portion of the structure containing the space to be fumigated. Seal all seams between adjacent tarpaulins. Seal all edges of the tarpaulin that touch the ground or ground level surface to that surface with, for example, soil, sand or weighted snakes resting on the edge of the tarp. After tarping, make sure that all operable windows and interior doors of the fumigated space are open. Leave windows closed if required by local and/or state regulations.

Fumigant can be lost (and damage to plants outside the fumigated space around the exterior of a fumigated structure can occur) when it is able to penetrate the soil surface within the fumigated space adjacent to where the tarpaulins rest against the ground and move outward. This movement is retarded when the soil between the foundation of the structure and the outermost edge of the tarpaulin around the perimeter of the structure contains a high level of moisture. If soil around the foundation of the structure is not sufficiently moist to act as a barrier to fumigant movement, wet all soil between the foundation of the structure and the outermost edge of the tarpaulin around the perimeter of the structure and around the root zone of plants that may be potentially affected.

### Structure Fumigation Without Using a Tarpaulin

For fumigated spaces or structures that can be adequately sealed against the excess movement of fumigant out of them without the use of a tarpaulin, seal adequately around exterior doors, windows, vents, fireplaces and other openings of the fumigated space. Use sealing materials and techniques proven to adequately retard the movement of fumigant out of a fumigated space such as tape and polyethylene sheeting. To minimize escape of fumigant through the soil and to avoid injury to nearby plants, wet soil (if not sufficiently moist) around the structure to act as a barrier to fumigant movement.

### Chamber Fumigation

Fumigations with ZYTHOR may be conducted in permanent fumigation chambers enclosed within, or connected to, a larger structure. A permanent chamber is defined as a durable hard-walled structure engineered specifically for fumigation that effectively confines ZYTHOR. Monitor indoor areas around the permanent fumigation chamber for ZYTHOR concentrations with an approved and properly calibrated Low Fumigant Level Detection Device during the fumigation, especially during fumigant introduction. No one is permitted in areas where the concentration of fumigant in the air is greater than 1 ppm unless they are using an approved Respiratory Protection Device. Aerate ZYTHOR from the chamber by venting it directly to the outside of the structure using a ventilation system that does not release ZYTHOR into the structure within which the chamber is located.

### Fumigation of Construction Materials, Furnishings (Household effects) Vehicles and Shipping Containers

Preparations must be as appropriate to the particular circumstances. Create a sufficiently gas tight seal that will adequately confine the fumigant to the fumigated space for the planned exposure period based on the directions for tarpaulin, non-tarpaulin and chamber fumigation above. If the sealed fumigant space is created within a larger structure (e.g., vehicle fumigated within a garage), the space within the entire structure should be considered fumigated space with respect to all requirements concerning preparation for fumigant introduction (except fumigant confinement and warning agent), structure entrance security, posting, evacuation, reentry, aeration and clearance. Stationary vehicles should be prepared and sealed following the instructions above. Vehicles, trucks, trailers, shipping containers, railcars, etc. may be fumigated with ZYTHOR, however all aeration/clearance procedures must be completed before these are transported or driven over public roads.

### Fumigation of Surface Ships in Port

Surface ships in size up to and including large ocean-going ships may be fumigated with ZYTHOR to control the pests listed on this label. The applicator and the ship's captain (or owner) shall follow all applicable regulations including those contained in the Code of Federal Regulations, Title 46 – Shipping, Chapter 1 - Coast Guard, Part 147A. Except for those persons involved in the fumigation, no people, plants, or pets may be on-board during fumigation.

The person responsible for the fumigation must notify the master of the vessel, or his representative, of the requirements relating to the use of Respiratory Protection Devices and Low Fumigant Level Detection Devices. Emergency procedures, cargo ventilation, periodic monitoring, inspections and first aid measures must be discussed with and understood by the master of the vessel or his representative.

If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or shall inform the master of the vessel, or his representative, when appropriate, of the leakage in order that corrective action can be taken by them.

Food, feed, drugs (including tobacco products) and medicinals shall not be exposed to the fumigant. If they are not removed from the vessel they shall be protected from exposure to the fumigant. The vessel must not be moved during the period of time between initial fumigant application and final clearance.

Approved Respiratory Protection Devices must be worn during reentry into the fumigated space when reentry occurs between the time of initial fumigant application and final clearance and a concentration of more than 1 ppm of fumigant is detected in a breathing zone of the fumigated space during that period.

**Warning Agent**

Chloropicrin is a warning agent that must be released within the space to be fumigated prior to introduction of ZYTHOR into that space. Even at very low levels of concentration in the air, unprotected exposure to chloropicrin in the air causes tearing and smarting of the eyes accompanied by a disagreeable, penetrating smell. Chloropicrin must be released into the fumigated space only by a Certified Applicator or someone under their direct supervision. Applicators must observe the chloropicrin precautionary statements and personal protective equipment appearing on this label, see the *Warning Agent* section of the manual.

Chloropicrin must be released within a fumigated space at least 5 minutes prior to introduction of the fumigant. Apply/release 1 fluid oz of chloropicrin per 10,000 to 15,000 cubic feet – (30 ml of chloropicrin per 283 to 425 cubic meters) of fumigated space or alternately use the chloropicrin dosage rate calculated by the Fumicalc program for the fumigated space. Establish at least one chloropicrin introduction site for each 45,000 cubic feet (1275 cubic meters) of fumigated space. When applying chloropicrin at multiple chloropicrin introduction points within a structure, start at the point farthest from the exit and work toward the exit. Dispense no more than 3 fluid ounces (90 ml) of chloropicrin into a single evaporation container. Distribution of chloropicrin throughout a fumigated space is enhanced by applying/releasing it as follows:

1. Place a shallow, wide container directly behind a fan in its air stream.
2. Place a handful of wicking agent, (e.g., cotton) in the bottom of the container.
3. Pour the chloropicrin over the wicking agent.

Do not place chloropicrin into a container made of magnesium, aluminum, or their alloys, as chloropicrin may severely corrode these metals. Removal of all chloropicrin evaporation containers from the fumigated space as soon as possible after commencement of the initial aeration procedure will speed dissipation of the chloropicrin from the fumigated space.

The use of chloropicrin is not required when fumigating railcars and shipping containers; however if chloropicrin is not used, a thorough pre-fumigation walk-through inspection must be performed of each railcar or shipping container with their doors being immediately locked upon leaving each car or container. A guard must be continuously posted during the period between ZYTHOR introduction and final clearance if no chloropicrin is used.

**Securing Fumigated Structure Entrances**

During the Exposure Period and Step 2 of the aeration procedures, fumigated structure(s) must be secured against the possibility of entry into the structure(s) by anyone other than a Certified Applicator or persons under their direct supervision. Two levels of security against unauthorized entry must be employed at each exterior entrance during those periods, if practicable. In addition to the use of existing locking mechanisms, if present, a secondary locking device must also be used. A locking device, such as a secondary lock, or barricade must be demonstratively effective in preventing an exterior door or doorway from being opened from the exterior using normal opening or entering processes by anyone other than the certified applicator in charge or the fumigation or persons under his/her direct supervision. Consult state and local regulations for any supplementary instructions and/or restrictions on securing against unauthorized entry into fumigated structures.

**Posting of Fumigated Spaces**

All entrances and all sides of the fumigated space including those within structures, chambers, vehicles, ships and stacks must be posted and placarded with warning signs. Signs must remain legible during the entire posting period. Post warning signs in advance of the fumigation in order to keep unauthorized persons away. All signs must bear the following in English and Spanish:

1. The signal word "DANGER/PELIGRO" and the SKULL and CROSSBONES symbol in red.
2. The statement, "Area under fumigation, DO NOT ENTER/NO ENTRE".
3. The date of the fumigation.
4. Name and EPA Registration Number of the fumigant.
5. Name, address, and telephone number of the fumigation company and the licensed/certified applicator.

Only a certified applicator may authorize removal of the signs and only when the concentration of Zythor within the structure where individuals typically stand, sit or lie down (breathing zone) is 1 ppm or less.

**DETERMINING DOSES AND EXPOSURE PERIODS FOR ZYTHOR**

The amount of ZYTHOR applied to the fumigated space is referred to as the dose. The level of fumigant present in the air is referred to as the concentration. Dose is expressed in pounds of fumigant and concentration is expressed in ounces of ZYTHOR per thousand cubic feet of fumigated space. Achieving target pest mortality with ZYTHOR is dependent upon the concentration of ZYTHOR present in the air the target pest is breathing. However, it is also dependent upon the length of the period of time the target pest is exposed to that concentration (exposure period) and the temperature. For a given temperature and rate of ZYTHOR loss from the fumigant space, increases in the concentration of ZYTHOR can reduce the length of the exposure period required to kill a pest. Conversely, under the same temperature and rate of fumigant loss conditions, increases in the length of the exposure period can reduce the concentration of ZYTHOR required to kill the same pest. Concentration in ounces per thousand cubic feet multiplied by the number of hours in the exposure period is referred to as the Kill Power Index.

The Fumicalc computer program, designed to run on most types of desktop and laptop computers and many handheld computers, is used to calculate the Kill Power Index that must be achieved within a fumigant space to kill the target pest and the dose and exposure period necessary to achieve that Kill Power Index. The Fumicalc program is part of the ZYTHOR labeling and must be used to calculate all doses and exposure periods for ZYTHOR. The Fumicalc accepts as inputs the factors necessary to compute these values for all labeled target pests. The Fumicalc program is available from Ensystex II, Inc.

Certain insects are more susceptible to exposure to ZYTHOR than others. This means higher Kill Power Indexes must be achieved for certain Target Pests compared to that needed to kill others. Higher Kill Power Indexes can be achieved for any fumigated space by administering a higher Concentration of ZYTHOR and/or extending the Exposure Period, all of which is handled by the Fumicalc automatically. All you have to do is tell the Fumicalc the Target Pest and it makes any necessary adjustments to the Kill Power Index.

The egg stage of some Target Pests are not susceptible to sulfuryl fluoride and thus cannot be killed by ZYTHOR. In this case it may be advisable to fumigate once at a concentration sufficient to control the post-embryonic (larva, pupa, adult) stages. After any surviving insect eggs have hatched, but prior to these insects' maturation and deposition of new eggs, fumigate a second time, again at the post-embryonic life stage concentration.

The Kill Power Index necessary to control different target pests is expressed in the following table as multiples of the Kill Power Index required to kill Drywood termites (Index = 1), assuming the applications occurred under the same conditions. When the egg stage of a Target Pest cannot be killed with ZYTHOR, the multiple of the Drywood Termite Kill Power Index that must be achieved to kill the non-egg stages only is given instead. These multiples apply to the use of ZYTHOR within all types of fumigated spaces. Refer to the Zythor Applicator's Manual for further details.

**Kill Power Indexes for Different Pests (Drywood Termite Index = 1)**

Pests	Multiple of the Drywood Termite Kill Power Index	Comments
Rodents <sup>1</sup>	1/2x	
Carpet Beetles	1x	Eggs are not killed
Cockroaches (except German) <sup>1</sup>	1x	Eggs are not killed
Cockroach (German) <sup>1</sup>	1x	
Furniture Carpet Beetles	3x	Eggs are not killed
Bedbugs	3x	
Old House Borers	4x	
Formosan Termites	4x	Above ground termites only are killed. Use in combination with other methods to kill infestations originating below ground.
Clothes Moths	6x	
Powder Post Beetles and Death Watch Beetles	10x	
<b><sup>1</sup>Do not use less than the specified dosage factors when treating for rodents, cockroaches, bedbugs, and termites.</b>		

**MONITORED VS. UNMONITORED APPLICATION**

Monitor or monitoring refers to the periodic measurement of the actual concentration of ZYTHOR contained within the air of the fumigated space. Monitoring confirms the concentration of ZYTHOR to which the Target Pest is exposed and allows for correction of variations of the actual from the expected concentration of ZYTHOR, if necessary. Monitoring can increase the accuracy with which the needed Kill Power Index is applied and is particularly recommended when a high level of precision is necessary. A monitored or unmonitored application of ZYTHOR can be made to any fumigated space for the control of any type of Target Pest. The ZYTHOR Fumicalc calculator is designed to calculate the dose of ZYTHOR (and supplements to the dose during the course of the fumigation in the case of a monitored application, if needed) for any fumigated space for both monitored and unmonitored applications.

**ZYTHOR RELEASE PREPARATION**

Prepare to release the ZYTHOR through a shooting tube to be attached to the ZYTHOR cylinder whose discharge end is positioned within the fumigated space. The system for introduction of ZYTHOR into the fumigated space (tubing, connectors, etc.) should be free of leaks and designed to withstand a minimum burst pressure of 500 pounds per square inch (psi).

If monitoring will occur, run gas sampling lines from representative locations within the fumigated space to exterior monitoring points before ZYTHOR introduction.

**Preventing Fogouts**

ZYTHOR is packaged as a liquid under pressure. When it is released into the fumigated space it must be converted into a gas to be effective as a fumigant. This process of release and conversion, if not properly prepared for and controlled, can result in damage to surfaces within the fumigated space from contact with water condensed from the air as the liquid to gas conversion process cools the air into which the fumigant is introduced and nearby surfaces. Damage can also occur when unconverted liquid fumigant, possibly present in the fumigated space after it is released but before it converts to a gas, comes into contact with surfaces that might be damaged by its presence.

The conversion of ZYTHOR from a liquid in the cylinder to a gas requires a source of heat. The heat to make this conversion is taken from the air into which the ZYTHOR is released as it contacts the air. The need for heat to make this conversion can cause problems when the release of fumigant removes enough heat from the air to cause the air temperature to drop below its Dew Point temperature. The amount of moisture a parcel of air can hold is dependent upon its temperature. The Dew Point temperature for a parcel of air is the temperature at which that air is holding as much moisture as it can hold. If the temperature of air falls below its Dew Point temperature, fog can form and moisture can condense from the air onto nearby surfaces if the temperature of these surfaces is low enough. The higher the percent relative humidity and the lower the temperature of surfaces in the fumigated space before the introduction of fumigant, the greater the chance fog will form in the air and/or condensation will form on surfaces.

Condensation can damage surfaces it forms on if they are sensitive to the presence of moisture.

The conversion of the fumigant from liquid to gas normally occurs almost instantaneously when it is released into the fumigated space, however it is possible that, based on the circumstances, some fumigant will remain in its liquid form for a short period of time after it has been released. This can be a problem if this super-cooled liquid fumigant is deposited onto surfaces that can be damaged by its presence, however brief.

Care must be taken to reduce the chances that moisture is condensed from the air within the fumigated space during fumigant application or that unconverted liquid fumigant is present within the fumigant space long enough to come to rest on surfaces. One way to accomplish both of these is to maximize the amount of air into which the fumigant is released. The greater the number of "units" of air used to vaporize each "unit" of fumigant, the less heat that must be removed from each "unit" of air during the conversion process. This reduces the possibility that the capacity of the air into which the fumigant is released to hold water or fumigant will be exceeded. Increase the volume of air into which the fumigant is released, and thereby maximize the rate of fumigant vaporization from liquid to gas, by situating the discharge end of the fumigant shooting tube on the positive pressure side of an operating fan (blast side) located within a large open area of the fumigated space. The air movement capacity of the fan should be at least 1,000 cubic feet per minute for each pound of ZYTHOR released per minute.

Using a small inside diameter shooting tube (1/8 inch) can also reduce the chances of un-vaporized fumigant coming to rest on surfaces within the fumigated space. To further protect against the effects of un-vaporized fumigant on surfaces, it is recommended that protective sheeting, such as polyethylene plastic, be placed on the floors in the vicinity of any fumigant release point. **In order to prevent damage, do not apply fumigant directly to any surface.**

Special care must be taken when the percent relative humidity of the air within the fumigated space is high (the amount of moisture in the air is high compared to the total amount it can hold). If necessary delay the fumigation until conditions are more favorable such as when the relative humidity within the structure to be fumigated is lower.

### ZYTHOR RELEASE

Before introducing the fumigant, verify that all required safety equipment is available and in good working order. Position the ZYTHOR cylinder(s) outside the space to be fumigated. Do not connect cylinders to introduction equipment until all fumigation warning signs have been posted and the space to be fumigated is clear of persons, non-target animals and is properly secured.

Release the ZYTHOR from outside the fumigated space. Wear splash resistant goggles or full face shield for eye protection during introduction of fumigant or when working around any lines containing fumigant under pressure. Do not wear gloves or rubber boots.

## AERATION AND CLEARANCE

### Aeration

The final step in using ZYTHOR is to remove it from within the fumigated space (aeration) and to confirm its absence from the breathing zone of the fumigated space after the completion of the aeration process (clearance). Aeration of ZYTHOR from a fumigated space involves actively exhausting and/or allowing the ZYTHOR to dissipate from the fumigated space out into the atmosphere. Clearance involves sampling the air within the breathing zone of the fumigated space with an approved and properly calibrated Low Fumigant Level Detection Device until readings given by the detection device indicate that fumigant is no longer present above 1 ppm within the breathing zone of the fumigated space. Only when certain periods of time (see *Aeration Procedures* below) have elapsed after the initiation of the aeration process and the level of fumigant remaining within the breathing zone of the fumigated space is confirmed at the end of those time periods to no longer exceed 1 ppm can final clearance for re-occupancy be given. Breathing zones are defined as areas within the structure where individuals typically stand, sit or lie down.

Special attention must be given to aerating attics and forced air handling system ducts. Active aeration of attics can be accomplished by directing a fan into attic access openings. Air handling systems can be aerated by activating the system blower or alternately directing a fan into one or more return vents.

Refer to the Zythor Applicator's Manual for further details.

### Respiratory Protection Requirements During Aeration and Clearance

The processes of aeration and clearance of the fumigated space require entry into the fumigated space while the level of ZYTHOR in the air within the breathing zone of the fumigated space still exceeds 1 ppm. All persons entering and/or remaining inside the fumigated space between the time of initial application of ZYTHOR to the fumigated space and final clearance of the fumigated space must adhere to the requirements of the *Respiratory Protection*, *Respiratory Protection Devices* and *Low Fumigant Level Detection Devices* sections of this label.

### Aeration Procedures

There are two approved procedures for aeration. The aeration procedure used for a fumigated space is based on the total amount of ZYTHOR per thousand cubic feet that was released within the fumigated space during the exposure period. All structures into which a total of more than 16 ounces of ZYTHOR per thousand cubic feet of fumigated space has been released during the Exposure Period must be aerated using Aeration Procedure 2. All other fumigated spaces can be aerated using either Aeration Procedure 1 or Aeration Procedure 2.

#### Aeration Procedure 1 – Applied Dose 16 oz/1000 cubic feet or less

**These steps must be completed in sequence.**

**Step (1):** Aerate the fumigated space with all operable windows and doors open, aided by the use of 1 or more fans, for a minimum of 1 hour. All of the fans used shall, in total, be capable of displacing at least 5,000 cubic feet of air per minute. The fans may be turned off for the remainder of the aeration period if desired.

**Step (2):** Secure fumigated space and do not allow reentry for a minimum of 6 hours from the start of the aeration process (first opening of the seal). During this time, the fumigated space must remain posted.

**Step (3):** After the minimum 6 hour waiting period, measure the concentration of ZYTHOR in the breathing zone of each room of the fumigated space using an approved and properly calibrated Low Fumigant Level Detection Device. If a concentration of ZYTHOR greater than 1 ppm is detected in the breathing zone, ventilate the fumigated space by opening operable doors and windows and continue to measure the concentration of Zythor in the breathing zone until it is 1 ppm or less. Fumigated space may be cleared for re-occupancy when the concentration of ZYTHOR as measured with an approved and properly calibrated Low Fumigant Level Detection Device is determined to be 1 ppm or less in the breathing zone.

#### Aeration Procedure 2 – Applied Dose More Than 16 oz/1000 cubic feet

**These steps must be completed in sequence.**

**Step (1):** Aerate the fumigated space with all operable windows and doors open, aided by the use of 1 or more fans, for a minimum of 1 hour. All of the fans used shall, in total, be capable of displacing at least 5,000 cubic feet of air per minute. The fans may be turned off for the remainder of the aeration period if desired.

**Step (2):** Secure the fumigated space and do not allow reentry for a minimum of 8 hours from the start of the aeration process (first opening of the seal). During this time, the fumigated space must remain posted.

**Step (3):** After the minimum 8 hour waiting period, measure the concentration of ZYTHOR in the breathing zone of each room of the fumigated space using an approved and properly calibrated Low Fumigant Level Detection Device. If a concentration of ZYTHOR greater than 1 ppm is detected in the breathing zone, ventilate the fumigated space by opening operable doors and window and continue to measure the concentration of Zythor in the breathing zone until it is 1 ppm or less. Fumigated space may be cleared for re-occupancy when the concentration of ZYTHOR as measured with an approved and properly calibrated Low Fumigant Level Detection Device is determined to be 1 ppm or less in the breathing zone.

#### Final Clearance and Re-occupancy

Do not reoccupy fumigated space, i.e., structure, ship, vehicle or chamber, or move fumigated vehicles until aeration is complete and clearance has been given. Warning signs must remain posted until aeration is completed and final clearance for re-occupancy is given.

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If terms of the following Warranty Disclaimer, Inherent Risks of Use or Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of the purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

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It is impossible to eliminate all risks associated with use of this product. Lack of performance or other unintended consequences may result because of factors such as use of the product contrary to the label directions or contrary to the dosage and/or exposure period recommendations of the Fumicalc, adverse conditions (such as unfavorable temperatures, high humidity, unfavorable soil conditions, excessive rainfall, etc.), abnormal conditions (such as excessive winds, tornadoes, hurricanes), presence of other materials, the manner of application or other factors, all of which are beyond the control of ENSYSTEX II or the seller. All such risks shall be assumed by the Buyer and User.

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