



WITH YOU ALWAYS

Marine *Newslink*

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FEATURE ARTICLE

Fumigation

PHOTO(S) OF THE MONTH

Fumigation Explosion

BACK TO BASICS

Question of the Month

FUMIGATION



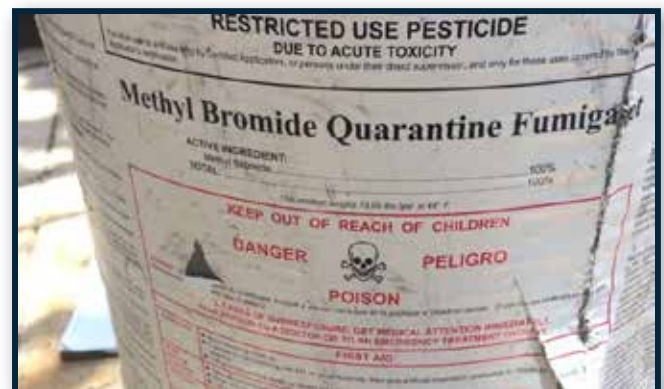
When importing or exporting, various cargoes require mandatory infest/insect pest controls and this process is widely known as Fumigation in cargo industry.

Fumigation is the process of releasing toxic gases (pesticides) into a cargo hold or container/compartments for eliminating or avoiding infestation by insects or other pests that may cause the cargo to deteriorate. Fumigation may take place either prior to and/or after loading of the cargo. In-transit fumigation is preferred by shippers and charterers because it reduces time in port.

A fumigant is a chemical which under certain conditions will enter a gaseous state and in sufficient concentration will be lethal to pest organisms. One important and useful property of fumigants is that in gaseous form they diffuse as separate molecules, thus enabling penetration into the material being fumigated and diffuse away afterwards. Aerosols and pesticides sprayed onto plants, etc., are not fumigants.

In the olden days, the traditional shipboard fumigants against insects in cargo used to be hydro-cyanide acid and mixtures of ethylene

dichloride and carbon tetrachloride, but around 1960s-70s these had been replaced by methyl bromide and hydrogen phosphide. Both are highly dangerous, if inhaled by humans.



Methyl bromide depletes the ozone layer and has been banned in the western world since 2005. Hydrogen phosphide (PH₃) commonly called "phosphine" and is now the most popular fumigant in use for disinfestation of dry plant products loaded in bulk. Phosphine is easy to handle by the fumigators, as it is manufactured in a solid formulation of either magnesium or aluminium phosphide. These solids, which often are in the shape of tablets, will react and break down in contact with water or in an atmosphere containing moisture. They will then release hydrogen



phosphide, a gas efficient in the killing of insects in bulk cargo, for instance grain. The most favourable conditions for complete release of phosphine from the tablets are in tropical and subtropical climates, where four to five days are sufficient. In temperatures below 15°C, or in a very dry atmosphere, much more time would be needed.

Pure phosphine gas is odourless. The odour, often compared to the smell of garlic, carbide or decaying fish, is due to a contaminant, offering the advantage of serving as a warning to people. But it is important to know that the lack of odour does not guarantee that there is no dangerous gas.



TYPES OF FUMIGANTS

The most widely used fumigants are phosphine-evolving gases (hydrogen phosphine) such as aluminium phosphide, magnesium phosphide, gas toxin or mangotoxin. These fumigants come in solid form, i.e., pellets, and are usually placed on the surface of the stow or inserted just beneath it.

Methyl bromide is applied in gaseous form from cylinders which connect to the containers/cargo holds via specially provided pipework. Methyl

bromide fumigation is not allowed in-transit and requires the crew to be disembarked whilst it is carried out.

Some gases and other agents commonly used for fumigation are flammable in sufficient concentrations. Some fumigants can also ignite, catch fire and even explode when in contact with water. Aluminium phosphide is not itself flammable, but in contact with water hydrogen phosphide gas will be created, which may ignite spontaneously in air. Ignition of high concentrations of hydrogen phosphide can result in a very energetic reaction, an explosion which may cause severe personal injury. To suffocate the flames, instead of water, sand, carbon dioxide or dry extinguishing chemicals should be used.

FUMIGATION PROCEDURES.

Offshore treatment

Official authorities consider offshore treatments to be an important part of dealing with potential quarantine risks. The effective treatment of some commodities prior to export to India is an increasingly important part of this approach of management of pest risk at bay. Relevant authority accepts offshore treatments only if performed by a fumigation operator (treatment provider) that can meet Indian plant quarantine requirements. To facilitate entry into India, a correctly completed fumigation certificate should accompany any consignment treated offshore. Relevant authority will conduct inspections on goods that arrive at Indian port accompanied by a treatment certificate. If inspectors detect infestation during an inspection, relevant authority will consider the consignment as having failed treatment and the consignment will be ordered for re-fumigation before the same given quarantine clearance and a report of non-compliance will be communicated.

On-shore treatments

Goods subject to quarantine may arrive in India without a valid treatment certificate. In some cases, the importer must have these consignments treated on arrival by an accredited fumigation operator. In other instances, the importer may choose between having the consignment fully inspected and if necessary treated. If the consignment is infested or contaminated with materials of quarantine concern it must then be treated by an accredited

fumigation operator under the supervision of relevant authority officer.

Treatment of export consignments

Many countries require certain goods exported from India to be treated prior to shipment to satisfy their own quarantine requirements. As a result, relevant authority is often requested to issue phytosanitary certificate for certain consignments endorsing that quarantine requirements. Further that wood packaging material including dunnage shall be required to be appropriately treated with methyl bromide and marked in compliance with ISPM-15



Fumigation of commodities with impervious packing/shrink wrapping

Unless specifically exempted by Relevant authorities, the goods covered with or packed in gas impervious materials (such as plastic wrapping or laminated plastic films, lacquered or painted surfaces, aluminium foil, tarred or waxed paper) must have the coverings or packaging opened, cut or removed, prior to fumigation. This must be sufficient to allow adequate gas penetration into the consignment and subsequent airing.

Fumigation of perishable commodities

Perishable commodities fall into several broad categories. They are live plants, cut flowers, fresh fruit and vegetables and some seeds. The minimum acceptable temperature for fumigation of perishable commodities is 10°C, unless specifically exempted by relevant authority. When temperatures are below 10°C some form of artificial heating is required. Unless otherwise specified, the fumigation process is of about two

hours duration, at least 60% of the original fumigant must be retained at the end of the treatment.

Nursery stock/bulbs/cut-flowers fumigation

Relevant Indian authority does not accept treatment of nursery stock by offshore treatment providers. It must be treated onshore. Living plants are likely to be damaged if fumigated at temperatures above 30°C.



Fresh fruits/vegetables fumigation

When fumigating fresh fruit and vegetables, the fumigator must use the fruit pulp temperature for dosage calculations, not the minimum ambient temperature as with other treatments. The pulp temperature must be measured and included on the Fumigation Certificate. As a minimum, the fumigator must sample from at least one place in each of the bottom, centre and top of the consignment. Each temperature probe should be placed into the centre of a piece of fruit situated in the centre of the carton (where appropriate).

Timber and timber products fumigation

Relevant authority will only accept fumigation of timber and timber products if:

- Individual planks, rounds or articles have at least one physical dimension, which is less than 200mm (8 inches) thick
- The consignment is vertically separated every 200mm (8 inches)
- There is adequate physical distance (at least 50mm) between the timber and both the base and roof of the fumigation enclosure. This is because effective methyl bromide concentrations will only penetrate 100mm

(4 inches) from the surface into the timber within the fumigation period. It also assists in getting adequate circulation on the fumigant around and throughout the consignment.



Fumigation of cargo containers

All containers must be fumigated under gas proof sheets unless it can be shown that they comply with the specified pressure test standard for gas-tightness. This process must be undertaken every time before any container is fumigated. The gas tightness should be determined using a pressure decay test. This corresponds to a pressure halving (or decay) time from 200-100 Pa of 10 seconds or more. Containers that cannot be pressurised to 250 Pa (the starting pressure for the test) are deemed to have failed the test and must be enclosed under gas proof sheets before being fumigated with methyl bromide.



Container selection

Selecting an appropriate container is very important when it is known that intended container

& cargo will be fumigated. The containers should be positioned to allow easy access to all four sides and the roof. They should stand on a flat, horizontal surface to avoid twisting (or racking), which may prevent the doors from closing properly.



Inspection of container

All containers should be inspected before pressure testing. They should be structurally sound with their sides and roofs free of holes and free of obvious distortion. The container identification number should be recorded on the fumigation certificate. The exterior of the container should be inspected to ensure it is structurally sound and in good condition – with no significant distortion. Its sides and roof must be sound and free of significant holes, tears or gaps. Where rust is present the affected areas should be closely inspected and probed for holes.

The doors must make firm contact with each other, the door frame and floor sill so that their seals function effectively. The rubber seals around the doors should be unbroken, leaving no obvious gaps. Containers with faulty doors and door seals are unsuitable for pressure testing.

The interior of the container should be inspected from inside, with the doors fully shut-closed. With the doors closed any gaps or holes should be visible as they will allow light to enter the container (Light Test). Containers with wet or damaged floors are unsuitable for pressure testing. The floor should be dry and have no signs of extensive damage. It must be ensured that the area around each ventilator is dry and free from grease, then completely sealed, to make them gastight.



The most effective way to close ventilators is to completely cover them with plastic sheeting (polyethylene or PVC) attached to the container using masking tape. Ventilators may also be sealed directly with masking tape or plastic duct tape. It is important to open all ventilators at the end of the exposure period and always before the container is loaded onto any form of transport (trucks, ships etc).



Fumigation of ship cargo holds

Fumigation of ship cargo holds is all together a different kind of matter, as unlike any other type of fumigations, large quantity of gas is required to be released into the ship cargo holds and further the space configuration will vary from ship to ship. Therefore, it is very important that the fumigation operation are performed by approved fumigation operator under the strict supervision of quarantine officer, who have considerable experience in undertaking ship fumigation. The safety issue is of prime concern, while undertaking ship fumigation both at the time of gassing as well as at the time of aeration of ship holds.

Safety aspects of ship fumigation

The most important safety aspect of ship fumigation is the protection of ship's crew. The approved fumigation operator has the following safety responsibilities when undertaking fumigation of ships/vessels:

- Observe all safety precautions, while fumigating/degassing of ship.
- Prevent access of unauthorized personnel including the ship's crew to the fumigated area.
- Carry out fumigation in accordance with provisions of this standard to ensure effective treatment.
- Evacuate the gas completely from ship holds and aerate the ship, when fumigation period is completed.
- Ensure freedom from methyl bromide gas from all the areas of the ship by testing with the help of gas detector before allowing crew members access to the ship.

Selection of ship

The following criteria should be considered, while selecting the ship for undertaking fumigation:

- Have a steel bottom with bilges that can be rendered gas-tight.
- Have preferably fitted with artificial ventilators or forced air injection and air recirculation system.
- Have hatch covers that are provided with gaskets to render sufficiently gastight, when closed.
- Preferably have cargo holds with no common connectivity with ship's crew cabins and engine room.

Inspection of ship holds

The quarantine officer should inspect the ship holds in association with the approved fumigation operator and the responsible ship's officer to determine the type of pest infestation and the commodity present for selecting appropriate treatment schedule. The fumigation operator should prepare a plan of fumigation and get it approved by the quarantine officer. The plan of fumigation should include hatch diagram indicating the position of fans, distribution of gas introduction lines and sampling tubes. During the inspection of ship holds, the fumigation operator should identify the possible areas requiring sealing to make the cargo holds gas tight.

Responsibilities of client

Client is any person or organization requesting the treatment from the fumigation agency. This could be the owner of the commodity, an agent, warehouse manager, agent representing buyer, an exporter or importer.

The client should:

- Choose a fumigation agency, who is holding valid license issued by State Government and accredited by the Plant Protection Adviser (PPA) of the Government of India, Directorate of Plant Protection, Quarantine & Storage, Faridabad.
- Inform the fumigation agency before commencing the treatment, about the quarantine treatment requirements of the commodity, the composition of consignment, storage condition and place of the commodity, end use of the consignment, package conditions and specific market requirements (fumigant residue limits, where applicable) and other contract or agreement requirements, where applicable.
- Ensure sufficient time is available to perform treatments to meet the quarantine requirements.
- Inform the transport contractor not to move the fumigated consignment or container until the degassing and release of the commodity or container.
- Ensure proper stocking of consignment or placing container on the ground to facilitate carrying out proper treatment.



Responsibilities of fumigation agency

The fumigation agency should:

- Hold valid license and certificate of registration granted by the Plant Protection Adviser.
- Be technically competent to perform relevant treatment to meet the quarantine requirements.
- Perform fumigation operations always under supervision of accredited fumigation operator.

- Advise the client on stocking of consignment for carrying out effective treatment.
- Advise the client about the time requirements for successful treatment of consignment.
- Seek from the client any specific conditions attached to the treatment of consignment.
- Inform the client of any other factors that affect treatment of commodity such as impervious package or sorptive nature of commodity.
- Ensure adopting right fumigation practices and follow safety precautions, while undertaking treatment operations.
- Maintain proper records on stock/use of fumigants and issue fumigation certificates after ensuring fumigations are carried out in effective manner.
- Follow the guidelines and abide by instructions issued by PPA.
- Ensure not to undertake fumigation in forbidden places or of forbidden commodities.

Responsibilities of transporters/container/shipping lines

The transport contractor may include freight agents, rail/road transporters, shipping and container agents

The transport contractor should:

- Secure from their clients and the fumigation agency any relevant information concerning the consignment viz., name of fumigant used, date and time when fumigation was performed and the time and duration of aeration of commodity
- Be aware the treatment of consignment
- Ensure not to transport or ship the container without degassing and understand the hazards associated with in-transit treatments
- Comply with local, national and international regulations concerning transportation of treated commodity, where applicable

Correct & proper fumigation has not only saved cargoes from infestations but also from rejections due to various reasons. An improperly fumigated cargo can result in disastrous consequence. Countries like Australia & New Zealand, take their ecological balance very seriously & have very strict rules on any types of agricultural & wood products entering their country. Cargoes arriving without proper fumigation or fumigation certificates are outright rejected and shipper or buyer may end up paying huge fines, not to mention the return freight expenses & loss of business.

PHOTOS OF THE MONTH:

EXPLOSION DUE TO FUMIGATION



BACK TO BASICS

QUESTION OF THE MONTH: (Please submit your answers to vijaypal.singh@tataaig.com & Shioram.Balachandran@tataaig.com by 25th of each month)

Insured was importing a consignment packed in total 25 regular 20 feet shipping containers valued at INR 5 crores. Cargo was imported from China, first via ship till Chennai port and then transported by Road till final destination in India, each container on a single road vehicle. Client had taken normal All risk MOP with extension of Seal Intact clause and deductible of 1% of the consignment value subject to minimum INR 10,000/- for each and every loss. Upon reaching factory all containers were found to be received with seals intact. But some cargo was found to be missing from one of the containers amounting to INR 2 Lacs. Client was not able to provide any proof of cargo weight in containers at any stage except during factory loading by supplier, neither were they able to prove any tampering to container. Will the claim be payable, and if yes, what would be the amount?

LAST MONTH'S QUESTION:

Insured has taken an All Risks policy for his exports. Cargo has food items. The cargo was containerized and sailed on time for the first leg but due to bad weather, could not reach the transshipment port on schedule. Hence, the designated onward journey ship from transshipment port till final destination left without loading the insured cargo. The insured's logistic vendor was trying to arrange the cargo on an alternate vessel. However the insured's customer now says that he doesn't want the cargo any more since if cargo arrives late, he would not be able to fulfil his contract obligations with his buyer. The insured wants to now claim damages from insurance company saying that the cargo should be considered a total loss since the cost of bringing back is more than the value of the cargo that he would get by selling it in India because by the time cargo reaches back to India, the cargo would have deteriorated due to the protracted delay.

LAST MONTH'S ANSWER:

Not payable. As per exclusion 4.5 of ICC-A – delay due to any reason is not covered, even though the delay be caused by a risk insured against. Also there was no actual damage to the cargo due to bad weather. Loss of market is not “loss of or damage to subject matter insured”, hence the same is out of purview of policy.

CORRECT ANSWERS SENT BY: (In order of replies received)

Shruti Chaubey - Zoom Insurance Brokers Pvt. Ltd., Gurugram
V Ganesan - Marsh India Insurance Brokers Pvt. Ltd., Chennai
Kritika Singh - Ideal Insurance Brokers Pvt. Ltd., Gurgaon
Arun P. Pai - TT Insurance Broking Services Pvt. Ltd., Bangalore
Nishi Priya - Toyota Tsusho Insurance Broker India Pvt. Ltd., Gurgaon
Bharat Bhushan - Optima Insurance Brokers Pvt. Ltd., New Delhi

**PLEASE SEND YOUR REPLIES/ANSWERS TO ADDRESSES
GIVEN ON LAST PAGE OF THE MARINE NEWSLINK**

IF YOU HAVE ANY COMMENTS / FEEDBACK PLEASE SEND IT TO

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