

3.4.3. Fumigation continued in transit

3.4.3.1

Fumigation in transit should only be carried out at the discretion of the master. This should be clearly understood by owners, charterers, and all other parties involved when considering the transport of cargoes that may be infested. Due consideration should be taken of this when assessing the options of fumigation. The master should be aware of the regulations of the flag State Administration with regard to in-transit fumigation. The application of the process should be with the agreement of the port State Administration.

The process may be considered under two headings:

- 1.** fumigation in which treatment is intentionally continued in a sealed space during a voyage and in which no aeration has taken place before sailing;
and
- 2.** in-port cargo fumigation where some aeration is carried out before sailing, but where a clearance certificate for the cargo space(s) cannot be issued because of residual gas and the cargo space(s) has been re-sealed before sailing.

3.4.3.2

Before a decision on sailing with a fumigated cargo is made it should be taken into account that, due to operational conditions, the circumstances outlined in **3.4.3.1.2** may arise unintentionally, e.g. a ship may be required to sail at a time earlier than anticipated when the fumigation was started. In such circumstances the potential hazards may be as great as with a planned in-transit fumigation and all the precautions in the following paragraphs should be observed.

3.4.3.3

Before a decision is made as to whether a fumigation treatment planned to be commenced in port and continued at sea should be carried out, special precautions are necessary.

These include the following:

- 1.** at least two members of the crew (including one officer) who have received appropriate training (see **3.4.3.6**) should be designated as the trained representatives of the master responsible for ensuring that safe conditions in accommodation, engine-room and other working spaces are maintained after the fumigator-in-charge has handed over that responsibility to the master (see **3.4.3.12**);
and
- 2.** the trained representatives of the master should brief the crew before a fumigation takes place and satisfy the fumigator-in-charge that this has been done.

3.4.3.4

Empty cargo spaces, are to be inspected and/or tested for leakage with instruments so that proper sealing can be done before or after loading. The fumigator-in-charge, accompanied by a trained representative of the master or a competent person, should determine whether the cargo spaces to be

treated are or can be made sufficiently gastight to prevent leakage of the fumigant to the accommodation, engine-rooms and other working spaces in the ship.

Special attention should be paid to potential problem areas such as bilge and cargo line systems. On completion of such inspection and/or test, the fumigator-in-charge should supply to the master for his retention a signed statement that the inspection and/or test has been performed, what provisions have been made and that the cargo spaces are or can be made satisfactory for fumigation.

Whenever a cargo space is found not to be sufficiently gastight, the fumigator-in-charge should issue a signed statement to the master and the other parties involved.

3.4.3.5

Accommodation, engine-rooms, areas designated for use in navigation of the ship, frequently visited working areas and stores, such as the forecastle head spaces, adjacent to cargo spaces being subject to fumigation in transit should be treated in accordance with the provisions of **3.4.3.13**.

Special attention should be paid to gas concentration safety checks in problem areas referred to in **3.4.3.4**.

3.4.3.6

The trained representatives of the master designated in **3.4.3.3** should be provided and be familiar with:

- 1.** the information in the relevant Material Safety Data Sheet, if available;
and
- 2.** the instructions on the fumigant label or package itself, such as the recommendations of the fumigant manufacturer concerning methods of detection of the fumigant in air, its behaviour and hazardous properties, symptoms of poisoning, relevant first aid and special medical treatment and emergency procedures.

3.4.3.7

The ship should carry:

- 1.** gas-detection equipment and adequate fresh supplies of service items for the fumigant(s) concerned as required by **3.4.3.12**, together with instructions for its use and the TLVs for safe working conditions;
- 2.** instructions on disposal of residual fumigant material;
- 3.** at least four sets of adequate respiratory protective equipment appropriate for the fumigant used;
- 4.** the necessary medicines and medical equipment;
and
- 5.** a copy of the latest version of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG). **Particular attention is drawn to table 550.**

3.4.3.8

The fumigator-in-charge should notify the master in writing of the spaces containing the cargo to be fumigated and also of any other spaces that are considered unsafe to enter during the fumigation. During the application of the fumigant the fumigator-in-charge should ensure that the surrounding areas are checked for safety.

3.4.3.9

If cargo spaces containing cargo are to be fumigated in transit:

1. After application of the fumigant, an initial check should be made by the fumigator-in-charge together with trained representatives of the master for any leak which, if detected, should be effectively sealed. When the master is satisfied that all precautions detailed in **3.4.3.1 to 3.4.3.12** have been fulfilled (refer to model checklist in annex 5) then the vessel may sail. Otherwise, provisions outlined in **3.4.3.9.2 or 3.4.3.9.3** are to be followed.

if the provisions of **3.4.3.9.1** are not satisfied, either:

2. After application of fumigants, the ship should be delayed in port alongside at a suitable berth or at anchorage for such a period as to allow the gas in the fumigated cargo spaces to reach sufficiently high concentrations to detect any possible leakage.

Special attention should be paid to those cases where fumigants in a solid or liquid form have been applied which may require a long period (normally from 4 to 7 days unless a recirculation or similar distribution system is used) to reach such a high concentration that leakages can be detected.

If leakages are detected, the ship should not sail until source(s) of such leakages are determined and eliminated. After ascertaining that the ship is in a safe condition to sail, i.e. no gas leakages are present, the fumigator-in-charge should furnish the master with a written statement that:

2.1. the gas in the cargo space(s) has reached sufficiently high concentration to detect any possible leakages;

2.2. spaces adjacent to the treated cargo space(s) have been checked and found gas-free;
and

2.3. the ship's representative is fully conversant with the use of the detection equipment provided.

or:

3. After application of the fumigants and immediately after the sailing of the ship, the fumigator-in-charge should remain on board for such period as to allow the gas in the fumigated cargo space or spaces reach sufficiently high concentrations to detect any possible leakage, or until the fumigated cargo is discharged (**see 3.4.3.20**), whichever the shorter, to check and rectify any gas leakages.

Prior to his leaving the ship, he should ascertain that the ship is in a safe condition, i.e no gas leakages are present, and he should furnish the master with written statement to the effect that the provisions of **3.4.3.9, 3.4.3.9.2.2 and 3.4.3.9.2.3** have been carried out.

3.4.3.10

On application of the fumigant, the fumigator-in-charge should post warning signs at all entrances to places notified to the master as in **3.4.3.8**. These warning signs should indicate the identity of the fumigant and the date and time of fumigation.

3.4.3.11

At an appropriate time after application of the fumigant, the fumigator-in-charge, accompanied by a representative of the master, should check that accommodation, engine-rooms and other working spaces remain free of harmful concentrations of gas.

3.4.3.12

Upon discharging his agreed responsibilities, the fumigator-in-charge should formally hand over to the master in writing responsibility for maintaining safe conditions in all occupied spaces. The fumigator-in-charge should ensure that gas-detection and respiratory protection equipment carried on the ship is in good order, and that adequate fresh supplies of consumable items are available to allow sampling as required in **3.4.3.13**.

3.4.3.13

Gas concentration safety checks at all appropriate locations, which should at least include the spaces indicated in **3.4.3.5**, should be continued throughout the voyage at least at eight-hour intervals or more frequently if so advised by the fumigator-in-charge. These readings should be recorded in the ship's log-book.

3.4.3.14

Except in extreme emergency, cargo spaces sealed for fumigation in transit should never be opened at sea or entered. If entry is imperative, at least two persons should enter, wearing adequate protection equipment and a safety harness and lifeline tended by a person outside the space, similarly equipped with protective, self-contained breathing apparatus.

3.4.3.15

If it is essential to ventilate a cargo space or spaces, every effort should be made to prevent a fumigant from accumulating in accommodation or working areas. Those spaces should be carefully checked to that effect. If the gas concentration in those areas at any time exceeds the TLV they should be evacuated and the cargo space or cargo spaces should be re-sealed. If a cargo space is re-sealed after ventilation it should not be assumed that it is completely clear of gas and tests should be made and appropriate precautions taken before entering.

3.4.3.16

Prior to the arrival of the ship, generally not less than 24 hours in advance, the master should inform the appropriate authorities of the country of destination and ports of call that fumigation in transit is being carried out. The information should include the type of fumigant used, the date of fumigation, the cargo spaces which have been fumigated, and whether ventilation has commenced. Upon arrival at the port of discharge, the master should also provide information as required in **3.4.3.6.2** and **3.4.3.7.2**.

3.4.3.17

On arrival at the port of discharge the requirements of receiving countries regarding handling of fumigated cargoes should be established. Before entry of fumigated cargo spaces, trained personnel from a fumigation company or other authorized persons, wearing respiratory protection, should carry out careful monitoring of the spaces to ensure the safety of personnel. The monitored values should be recorded in the ship's log-book. In case of need or emergency the master may commence ventilation of the fumigated cargo spaces under the conditions of **3.4.3.15**, having due regard for the safety of personnel on board. If this operation is to be done at sea, the master should evaluate weather and sea conditions before proceeding.

3.4.3.18

Only mechanical unloading that does not necessitate entry of personnel into the cargo spaces of such fumigated cargoes should be undertaken. However, when the presence of personnel in cargo spaces is necessary for the handling and operation of unloading equipment, continuous monitoring of the fumigated spaces should be carried out to ensure the safety of the personnel involved. When necessary, these personnel should be equipped with adequate respiratory protection.

3.4.3.19

During the final stages of discharge, when it becomes necessary for personnel to enter the cargo spaces, such entry should only be permitted subsequent to verification that such cargo spaces are gas-free.

3.4.3.20

Upon completion of discharge and when the ship is found free of fumigants and certified as such, all warning signs should be removed. Any action in this respect should be recorded in the ship's log-book.

3.5 Carriage of fumigated freight containers, barges and other cargo transport units on a ship

3.5.1 Loaded without ventilation after fumigation

3.5.1.1

If it is intended that freight containers, barges or cargo transport units containing cargo under fumigation should be taken on board ship without preliminary ventilation, their shipment must be considered as a Class 9 Hazard under the IMDG Code and as such the procedures should conform to the requirements as specified in the schedule for CARGO TRANSPORT UNIT UNDER FUMIGATION of the Code (see annex 4). The following special precautions, incorporating the IMDG requirements, are necessary:

1. A freight container, barge or cargo transport unit containing cargo under fumigation should not be allowed on board until sufficient time has elapsed to allow the attainment of a reasonably uniform gas concentration throughout the cargo.

Because of variations due to types and amounts of fumigants and commodities and temperature levels, it is recommended that the period to elapse between fumigant application and loading should be determined locally for each country.

Twenty-four hours is normally adequate for this purpose.

2. The master should be informed prior to loading of freight containers, barges and cargo transport units under fumigation. These should be identified with suitable warning signs incorporating the identity of the fumigant and the date and time of fumigation. Any freight container under fumigation must have the doors substantially secured before loading onto a ship.

Plastic or lightweight metal seals are not sufficient for this purpose. The securing arrangement must be such as to allow only authorized entry to the freight container. If container doors are to be locked, the means of locking should be of such a construction that in case of emergency, the doors could be

opened without delay. Adequate instructions for disposal of any residual fumigant material should be provided.

3. Shipping documents for freight containers, barges or cargo transport units concerned should show the date of fumigation and the type and amount of fumigant used.

4. Stowage on deck should be at least 6 m away from vent intakes, crew quarters and regularly occupied spaces.

5. Stowage under deck should only be undertaken when unavoidable and then in a cargo space equipped with mechanical ventilation sufficient to prevent the build-up of fumigant concentrations above the TLV. The ventilation rate of the mechanical ventilation system should be at least two air changes per hour, based on the empty cargo space. The provisions of **3.4.3.13** should apply.

6. Equipment suitable for detecting the fumigant gas or gases used should be carried on the ship, with instructions for its use.

7. Where the stowage requirements in 3.5.1.1.5 cannot be met, cargo spaces carrying fumigated freight containers, barges or cargo transport units should be treated as if under fumigation and the provisions of **3.4.3.3 to 3.4.3.13** should apply.

3.5.1.2

Prior to the arrival of the ship, generally not less than 24 hours advance, the master should inform the appropriate authorities of the country destination and ports of call that fumigation in transit is being carried out. The information should include the type of fumigant used, the date of fumigation and cargo spaces carrying fumigated freight containers, barges or cargo transport units. Upon arrival at the port of discharge, the master should also provide information as required in **3.4.3.6.2 and 3.4.3.7.2**.

3.5.2

Fumigated freight containers, barges or other cargo transport units ventilated before loading.

3.5.2.1

Freight containers, barges or cargo transport units that have been ventilated after fumigation to ensure that no harmful concentration of gas remains should have the warning signs removed and, whether empty or load may be taken on board a ship without the precautions in **3.5.1.1.1 to 3.5.1.1**

3.5.3 Fumigation after loading on board a ship

3.5.3.1

No person should fumigate the contents of a freight container, barge or cargo transport unit once it has been loaded on board a ship.