The Gafta Standard for
Fumigation
and Pest Management
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1 Introduction

1.1 Gafta (The Grain and Feed Trade Association) is the international association representing the trade and supply of agricultural commodities, animal feed materials, pulses, rice, spices and general produce worldwide.

1.2 The Gafta Standard is an independently audited scheme designed to maintain and improve the level of competence of activities related to the trade of agricultural commodities, animal feed materials, pulses, rice, spices and general produce worldwide. It comprises three Codes of Practice:

- The Gafta Standard for Analysis and Testing
- The Gafta Standard for Supervision, Sampling and Weighing
- The Gafta Standard for Certification to the Gafta Standard for Fumigation and Pest Management

1.3 Certification to the Gafta Standard for Fumigation and Pest Management is conditional on a successful audit assessment by the Certification Body/Bodies approved and appointed by Gafta. Continued certification is conditional on successful annual audits of the Gafta Standard for Fumigation and Pest Management no later than 14 months of the anniversary of the initial audit.

1.4 The initial audit will be completed by a site visit by the auditor. The following two annual audits may be carried out remotely via electronic sharing of documents and telephone or video conferencing. The fourth audit, and every third audit thereafter, will be completed by a site visit by the auditor. Gafta and the Certification Body/reserve the right to conduct a site visit at any annual audit or any other time (e.g. unannounced ‘spot checks’) where it considers it to be necessary.

1.5 Non-conformances raised at the audit of the Gafta Standard must be closed by providing documentary evidence or a revisit. Non-conformances must be closed within three months of an initial audit and within 28 days of any subsequent audit. Failure to provide satisfactory evidence will result in suspension from the Gafta Approved Register of Fumigators and may lead to inquiry under the terms of the Gafta Membership Complaints and Disciplinary Regulations.

1.6 Failure to reinstate from ‘suspended’ status within 28 days of notification of the suspension will result in the Fumigator being withdrawn from the scheme. After withdrawal, reinstatement will only be possible after a full initial audit at the cost of the Fumigator.

1.7 Gafta and the appointed Certification Body reserves the right to suspend or withdraw membership of the Gafta Approved Register of Fumigators when it considers it necessary to do so to prevent the Register or the Association being brought into disrepute.

1.8 Successful third party audit to the Gafta Standard is one of the requirements of entry onto the Gafta Approved Registers which provide authorisation for companies to provide its services under Gafta Contract Terms and Conditions. This Standard should be read in conjunction with the requirements for the Approved Registers and the relevant Gafta Codes of Conduct which can be found on the Gafta website www.gafta.com and in Appendix A.

2 Scope – The Gafta Standard for Fumigation and Pest Management

2.1 Pest control management and fumigation are important to all sectors of the food and animal feed industry. This Standard is intended to improve the level of competence and understanding about infestation, pest control and fumigants in traded combinable crops and animal feed materials and the food supply chain.

2.2 This Standard covers the management and operational procedures of the Fumigator (and his trained representatives) when carrying out the fumigation and degassing of agricultural commodities on a ship, in a storage or in freight containers in relation to food/fodder safety. It details best practice procedures of the Fumigator within the scope of his responsibility, including the handing over of responsibility to the owner or custodian of the commodity when required.

2.3 It is a requirement of this Standard that only fumigators approved for use on agricultural commodities by the relevant authorities in the countries and ports that the commodities are treated are used.

2.4 This Standard only covers the fumigation or treatment of agricultural commodities.

2.5 This Standard does not guarantee the success of the fumigation or treatment and relates only to the effort of the application.

2.6 This Standard does not replace any legislative or health and safety requirements applicable in the country the activity is carried out.

2.7 Marine fumigation is the fumigation of commodities in ships’ holds.

Phosphine gas (Hydrogen Phosphide), is the only fumigant allowed for this purpose by IMO Recommendations on the Safe Use of Pesticides in Ships (latest version 6) and in the IMDG Code Supplement (latest version of).

The process of in-transit marine fumigation begins at the load port, continues for a defined time during the voyage to destination and ends at the discharge port.

To provide for safety and efficacy the participation and cooperation of at least three parties is required throughout this period of time: Fumigators at the load port, mariners, and Fumigators at the discharge port. As the vessel will normally sail shortly after completion of fumigation application it is impossible to assess the full efficacy of the fumigation before sailing.

It is a recommendation of this Standard that a Fumigator listed on the Gafta Approved Register of Fumigators is responsible for degassing at the discharge port.

Fumigation can also be carried out on cargoes while the ship is in port, either before sailing or on arrival at destination port. Where phosphine gas is used, the same procedure as for in-transit fumigation should be followed. A separate procedure is followed for the use of methyl bromide for in port fumigation.

2.8 Store and Silo fumigation is the fumigation of goods on land, in a recognised storage facility, usually with phosphine gas although other fumigants may be used in some situations. Goods in silo bins are treated in similar fashion to those in a ship’s hold. Goods in flat stores need to be enclosed by gas-tight sheeting, and the fumigated area or building sealed off to prevent access.

2.9 Fumigation of Freight Containers is the fumigation of goods that are being carried in freight containers. The fumigation and ventilation is usually completed before transit.

Containers that are transported while under in-transit fumigation are classified by the IMDG Code – Dangerous Goods as a ‘FUMIGATED UNIT CLASS 9 UN3339’. This standard therefore requires the Fumigator to perform his operations all in accordance with the relevant sections of the IMDG Code, and to ensure all other safety requirements are complied with.

2.10 Degassing/Venting is the process at the end of the exposure period, after the fumigation enclosure is unsealed, when fumigant gas desorbs and diffuses out of the product that was fumigated and the fumigation enclosure. It is a recommendation of this Standard that a Fumigator listed on the Gafta Approved Register of Fumigators is responsible for degassing at the discharge port.

3 General Terms and Definitions

3.1 Key Standards – Standards marked with a (∗) in the left hand margin indicate a ‘key’ standard. If during an audit an assessor finds a major non-conformance against a key standard this shall result in suspension until rectified. See sections 1.5, 1.6 and 1.7.

3.2 Records – Where an () appears in a standard this indicates that a record(s) must be kept in relation to that standard.

Internally produced records must be signed by the person carrying out the task/activity.

Records must be legible and kept in suitable conditions that allow ready retrieval and prevent deterioration. Records must be kept for a minimum of five years unless there are additional requirements.

3.3 Confidentiality – The auditor requires access to all documentation relevant to the Gafta Standard assessment. All information will remain in confidence with the certification body and will not be disclosed to any third party.
4 Specific Terms and Definitions

Specific terms and definitions relating to this manual are as follows:

4.1 Animal Feed Materials – are raw materials and straight feeds, feed additives, etc. (as defined under the applicable Feedingstuffs Regulations) intended as an animal feed material.

4.2 Combinable Crops – are grain, pulses (peas and beans) and oilseeds (rapeseed and linseed, as-grown cereal seeds and herbage seeds – grass, clover, etc), pulse seeds and oilseeds for seed processing.

4.3 The Company – is any company who is a principal in a transaction or for whom a service is being provided.

4.4 Clearance (also known as Gas Free) – is the assessment after the degassing period when the Fumigator tests the air in the workspace to make sure that the concentration of fumigant gas has fallen to a below safe levels as defined in the relevant safety regulations.

4.5 Clearance Certificate (or Gas Free Certificate) – is the document issued by the Fumigator after degassing (venting) of the cargo at destination, indicating safe levels of the fumigant tested and declaring that the area does not exceed safe legal limits for workers to enter a fumigated space and/or handle a fumigated product.

4.6 Degassing/Venting – is the process at the end of the exposure period, after the fumigation enclosure is released when fumigant gas desorbs and diffuses out of the product that was fumigated and the fumigation enclosure. It is recommended that the Fumigator list on the Gafta Approved Register of Fumigators is responsible for degassing at the discharge port.

4.7 Disposal – is the process of collection of the waste residues from on-board vessels and other means of transport for neutralisation and destruction by an approved and qualified operator.

4.8 Exposure Time – is the period of time the product applied (toxic gas or biocide) is in direct contact with the target organism at a specific spot (location) to achieve the desired effect on the pest. The time required for in-situ release in case of the active ingredient and/or the time required for dissipation (migration) throughout the product to the relative spot (location) is not part of the exposure time. As long as the product applied is not in direct contact with the target organism, the exposure time has not commenced. The exposure time is dependent on physical, chemical and biological parameters e.g. temperature, relative humidity, target species, product applied etc.

4.9 Fumigants – are toxic gases which are used to target infestations.

4.10 Fumigant Application – is the process of introduction of a specific toxic gas or a chemical releasing toxic gas into the product to be treated and its enclosure for control of target organism(s).

4.11 Fumigation – is the process of application, exposure and dissipation of a toxic chemical in its gaseous state with the purpose of control of target insect pests in the product and its enclosure.

4.12 Fumigation Certificate (or Fumigant Application Certificate) – is the document reflecting the service rendered issued after fumigation application stating the characteristics and procedure applied.

4.13 Fumigator – means the appointed fumigation company including the Fumigator-in-Charge and his trained technician(s).

4.14 Gas Tightness – is the determination of how effective the holds are at retaining the fumigant gas generated. Wherever possible measures should be taken to check the gas tightness of the ships held prior to commencement of loading for both the safety of the crew and also to ensure the efficacy of the treatment. These measures could include, but are not limited to, ultrasonic testing, smoke test or visual checks and inspections.

4.15 Goods – are all animal feed materials, combinable crops, finished products and processed materials for food and/or feed purposes.

4.16 Hazard Analysis and Critical Control Points (HACCP) – is a system which identifies, evaluates, and controls hazards which are significant for food and feed safety. More information is available at www.galfa.com

4.17 HACCP Plan – is a document prepared in accordance with the principles of HACCP to ensure control of hazards which are significant for food and feed safety in the segment of the supply chain under consideration. More information is available at www.galfa.com

4.18 In-transit Fumigation – is the process of fumigation during a voyage. Note: as the vessel will normally sail shortly after completion of fumigation application it is impossible to assess the full efficacy of the fumigation before sailing.

4.19 Master – is the Master of the ship and/or his trained representative(s).

4.20 Re-circulation System – is the supporting equipment for improvement of gas penetration in the fumigated cargo.

4.21 Removal of Spent Fumigant – is the process of removal of retrievable parcels (sleeves, sachets, plates, blankets) of residues from the reacted metal phosphides at the end of the exposure/fumigation process. Residues must be handled in accordance with the applicable regulations and manufacturer’s safety guidelines.

4.22 Store – is any building, shed, silo, bin, tank or other container used to store goods.

4.23 Treatment Period – is the period of time required for release (generation) of the toxic gas from the product applied, dissipation throughout the product and the exposure time required to achieve effective action on the target pests in the fumigated product and its enclosure. In addition to the parameters relevant for the exposure time, treatment time depends on the permeability of the commodity, the volume of the fumigated cargo, the commodity or product type etc.

4.24 TLV – is the Threshold Limit Value of a chemical substance is a level to which a worker can be exposed day after day for a working lifetime without adverse effects.

5 General Obligations and Requirements

5.1 General Obligations

Outlined in this manual are the main areas of importance with respect to fumigation matters relating to combinable crops and animal feed materials, and should be read in conjunction with the following manuals/guides which address the individual requirements for particular logistical operations/procedures. Fumigators must demonstrate access to the latest version of each publication:

- Gafta Fumigation Rules No. 132
- International Maritime Organisation (IMO) Safe use of Pesticides on Ships
- International Maritime Dangerous Goods (IMDG) – relevant sections
- SOLAS (Safety of Life at Sea) Convention
- All relevant local legislation and/or regulations.

5.2 Fumigators and ship owners and their representatives are required to comply with all the relevant requirements of the country and ports that vessels or cargo spaces are fumigated or ventilated in. For example, in USA ports to the requirements of the US Coastguard, in UK ports to the requirements of the UK Merchant Shipping Regulations and the UK Marine Coastguard Agency requirements, such as MGN284. In addition, any requirements of the country that the ship is flagged to must be adhered to.

The fumigation materials used must be applied strictly in accordance with the manufacturer’s instructions, calibrations and safety precautions on the label, and records retained.
In order for Fumigators to perform their activities, precise instructions are needed from their principals at the time of receiving the order. Fumigation companies shall nominate a suitably experienced person as a Technical/FILE Manager who shall be the responsible person for receiving instructions from a principal and who shall be responsible for forwarding the appropriate instructions to the Fumigator(s). The Technical/FILE Manager shall be a permanent employee responsible for ensuring that sufficient information has been received to enable the Fumigators to satisfactorily carry out their duties.

5.4

Fumigators are required to retain copies of all documents issued following any fumigation of goods, for a minimum period of five years.

6 Complaints Procedure

The Fumigator must have a documented procedure for handling complaints. This procedure must include systems for:
- The prompt documentation and investigation of complaints
- The prompt feedback to the complainant with findings
- Deciding on internal actions required to prevent re-occurrence.

7 Hazard Analysis and Critical Control Points (HACCP)

The application of a HACCP approach and risk analysis is central to the Gafta Standard Scheme with the aim of minimising losses, damage and contaminant risks. Fumigators must demonstrate an awareness of the principles of HACCP and have a risk assessment plan in place covering their activities. The HACCP plan should include a procedure for advising the relevant parties regarding any threats to food or feed safety as required by the relevant regulations.

8 Training

8.1 Only fumigation technicians trained (or operating under a qualified technician) and licensed (or equivalent permit/document) to the requirements of the country where the fumigation or ventilation activities are taking place should be permitted to carry out any fumigation or ventilation work. Training should include all relevant codes and regulations including, but not limited to, those listed in Section 5.1 General Obligations and Requirements. Where fumigation takes place in international waters, training and certification should be in accordance with the safety practices of this Standard.

8.2 Technicians should be trained and deemed competent in the use of all fumigants used.

9 In-transit Fumigation of Bulk and Bagged Cargo in Ship’s Holds with Phosphine

It is the responsibility of the principal to ensure that the suitability of the carrying vessel and the appropriate permissions regarding the operation of fumigation on-board a vessel are agreed and acceptable to the master/owners by incorporating suitable terms in the freight contract (Charter Party).

9.1

9.2 The Fumigator must ensure that the Master has access to a copy of the Phosphine Fumigation and Ventilation Manual and the latest version of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG).

9.2.1 Safe and effective in-transit fumigation is dependent on the participation and cooperation of fumigation team under the responsibility of the Fumigator in Charge and the ship’s crew. The specific responsibilities are listed below. For the purposes of this Standard, only the Fumigator’s responsibilities are audited, although evidence is required of the Fumigators obligation to make the Master and ship’s crew aware of their responsibilities.

9.2.2 Where phosphine fumigation and ventilation is carried out in port or at anchor (not in-transit – i.e. after loading but prior to sailing, or at discharge port, prior to discharge) the same procedure should be followed.

9.3 Before fumigant application:

9.3.1 The Fumigator must ensure that all the cargo spaces to be fumigated are suitable for fumigation.

9.3.2 The Master must ensure that there are four sets of RPE as well as gas monitoring equipment are on board as well as gas monitoring equipment suitable for the length of the voyage.

9.3.3 In the event that sufficient quantities of effective safety equipment are not on board, the Fumigator should remind the Master in writing of his responsibility to carry this and should assist the Master wherever possible by either supplying the equipment at the owner’s cost or making arrangements for it to be supplied so that the ship fulfills its responsibility to carry sufficient items.

9.3.4 In accordance with IMDG and IMO Regulations, vessels should carry the necessary medicines and medical equipment, and the latest version of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG).
9.4.1 The Fumigator must ensure that the Master has been notified in writing of the spaces containing fumigated cargo.

9.4.2 The Fumigator must ensure that the spaces adjacent to (or with possible connection to) the treated cargo spaces have been checked and found to be gas free.

9.4.3 The Fumigator must ensure that the Master or his trained representatives have been made aware of the possibility of gas diffusing throughout the duct keel and/or ballast tanks and/or fire warning system.

9.4.4 The Fumigator must ensure that responsible crew members have been shown how to take gas readings correctly when gas is present, and they are fully conversant with the use of gas detection equipment provided.

9.4.5 The Fumigator must ensure that the Master or trained representatives have been made aware that even though the initial check may not indicate any leaks, it is essential that monitoring is to be continued in the accommodation, engine-room, etc because concentrations may reach their highest levels after several days.

9.4.6 The Fumigator must ensure that the Master or trained representatives have been made aware of the concentrations of gas (IMO Recommendation).

9.4.7 The Fumigator must ensure that the Master or trained representatives have been made aware that the Master is responsible for all aspects of the safety of the fumigation once the Fumigator has formally handed over responsibility to him, and left the vessel.

9.4.8 The Fumigator must ensure that the Master clearly understands that even if no leakage of fumigant is detectable at the time of sailing this does not mean that leakage will not occur at some time during the voyage due to the movement of the ship or other factors. This is why it is essential the Master ensures regular checks are carried out during the voyage.

9.4.9 The Master should ensure that during the voyage, regular checks for gas leakage should be made throughout all occupied areas and the findings recorded in the ship’s log (IMO Recommendation).

9.4.10 The Fumigator must ensure that he has supplied a signed statement to the Master confirming all points as listed above and all other requirements of the IMO Recommendations and any other relevant requirements must be adhered to.

9.4.11 Written documentation in respect of the following should be supplied by the Fumigator to the Master. Copies signed by both parties should be retained by both parties:

- Pre-Fumigation Inspection report
- Safety recommendations for vessels with fumigated cargoes
- Manufacturer’s information or safety data sheet
- Information on Residue Hazards
- First aid and medical treatment instructions
- Fumigation certificate
- Fumigation plan – for examples of a schematic fumigation plan see Appendix C
- Instructions for the use of the Phosphine Gas Detecting Equipment
- Precautions and procedures during voyage
- Instructions for aeration and ventilation Precautions and procedures during discharge
- Emergency procedures.

9.4.12 When the Fumigator has discharged his responsibilities, the Fumigator should formally hand over in writing responsibility to the Master for maintaining safe conditions in all occupied areas, which the Master should accept (IMO Recommendation).

10 In Port Fumigation and Ventilation of Bulk and Bagged Cargo and of empty holds/accommodation to eradicate rodent or insect infestation

10.1 Methyl Bromide is sometimes used for cargo fumigation as it is normally possible to achieve an effective fumigation of the cargo in 24–48 hours.

Note: Each type of fumigation product requires specific procedures, equipment and expertise from the applicator/fumigator. See Section 8 Training.

Note: Methyl Bromide is banned for use in some countries but allowed or required in others. However even when it is allowed for use this Standard does not recommend its use for environmental and safety reasons. Methyl Bromide is not permitted for in-transit fumigation.

Note: Whilst recognising that Hydrogen Cyanide is legally able to be used in some countries this Standard does not recommend or endorse its use.

10.2 The Master must ensure the crew search the vessel thoroughly to ensure there are no stowaways or other unauthorised personnel on board before fumigation takes place.

10.3 The crew should be landed and remain ashore until the ship is certified gas free in writing by the Fumigator. The Master may appoint a competent crew member to remain in attendance to ensure the safety of the ship provided they adhere to safety instructions issued by the Fumigator.

10.4 The Fumigator must carry out a safety assessment taking into account the IMO Recommendations and also any limitations applied by the law of the country or flag of the ship, and contracts related to the cargo, or to the ship owner’s instructions. All necessary measures must be taken to ensure the safety of the vessel and crew. A report of findings and any recommendations should be made in writing to all relevant parties. Ensure the recommendations made have been performed.
The Fumigator must ensure that all the cargo spaces to be fumigated are suitable for fumigation.

The Fumigator must advise the appropriate efficacy criteria in relation to the required minimum effective dosage, method of treatment and exposure time. Guidance criteria are available in a number of guide notes and handbooks. Other National Plant Protection Organisation requirements may apply.

The Master, Fumigator or relevant authorities should not allow discharge of the cargo to commence until he is satisfied that the cargo has been correctly ventilated and that any other requirements of the discharge port have been met (IMO Recommendation). It is a recommendation of this Standard that the cargo is declared gas free by a Fumigator listed on the Gafta Approved Register of Fumigators through the issuance of a Clearance or Gas Free Certificate.

11 Fumigation of Freight Containers

11.1 The Fumigator must ensure that as far as is practicable the container is made gas-tight before the fumigant is applied either by sealing as necessary, pressure testing or some other accepted method.

11.2 The Fumigator must ensure that the containers are clearly marked with appropriate warning signs stating the type of fumigant used and the date applied and all other details as required by the relevant local authorities.

11.3 The Fumigator must ensure the agreed formulation of fumigant is used at the correct dosage to comply with the contractual requirements, and records retained. The Fumigator must advise the appropriate efficacy criteria in relation to the required minimum effective dosage, method of treatment and exposure time.

11.4 After the required exposure time, the Fumigator must safely ventilate and test the containers. The Fumigator can then issue a ‘certificate confirming presence of harmful concentrations of fumigant is below detectable limits’. Only with this certificate can containers be loaded on board ships as if they had not been fumigated.

Note: A ‘certificate confirming presence of harmful concentrations of fumigant is below Threshold Limit Value’ is only valid at the time and place of issuance since commodities can desorb noxious fumes following ventilation resulting in the return of a toxic atmosphere.

Where containers are fumigated but not ventilated prior to loading on board ships, they are deemed to be ‘fumigated in-transit’ and classified by the IMDG Code as ‘FUMICATED UNIT CLASS 9 UN 2259’.

The Fumigator must ensure such containers are clearly marked with appropriate warning signs stating the type of fumigant used and the date applied and all other details as required by the IMDG Code and IMO Recommendations.

11.6 Obligations on the Exporter/Agent:

- The Exporter/Agent must ensure the correct permissions have been obtained to allow fumigated containers on board the ship.
- The Exporter/Agent must ensure that the master is informed that the containers are under fumigation prior to the loading of the containers.
- The Exporter/Agent must ensure that the containers are clearly marked by the Fumigator with appropriate warning signs stating the type of fumigant used and the date applied and all other details as required by the IMDG Code and IMO Recommendations.
- The Exporter/Agent must ensure that shipping documents show the date of fumigation and the type of fumigant and the amount used all as required in the IMDG Code.
- The Exporter/Agent must follow all specific port regulations. The Fumigator is advised to ensure the Exporter/Agent is aware of his obligations.

12 Store and Silo Fumigation

12.1 The Fumigator must carry out a safety assessment of the store/silo to be treated. This should consider potential areas of gas leakage, such as ducting on the floor or via the walls. A report of findings and any recommendations should be made in writing to all relevant parties. The recommendations made should have been performed prior to fumigation.

12.2 The Fumigator should ensure that the premises are declared out of bounds to personnel and public for the duration of the fumigation.

12.3 The Fumigator should recommend any equipment (such as temperature probes and other monitoring equipment) within the commodity has been removed prior to fumigation.

12.4 The Fumigator must ensure that the store/silos are clearly marked with appropriate warning signs stating the type of fumigant used and the date applied and all other details as required by the relevant local authorities.

12.5 The Fumigator must ensure the agreed formulation of fumigant is used at the correct dosage to comply with the contractual requirements, and records retained. The Fumigator must advise the appropriate efficacy criteria in relation to the required minimum effective dosage, method of treatment and exposure time.

12.6 After the required exposure time, the Fumigator must safely ventilate and test the store/silo. The Fumigator can then issue a ‘certificate confirming presence of harmful concentrations of fumigant is below detectable limits’.

Note: A ‘certificate confirming presence of harmful concentrations of fumigant is below Threshold Limit Value’ is only valid at the time and place of issuance since commodities can desorb noxious fumes following ventilation resulting in the return of a toxic atmosphere.

13 Degassing/Venting

13.1 It is a recommendation of this Standard that a Fumigator listed on the Gafta Approved Register of Fumigators is responsible for degassing at the discharge port.

13.2 The Fumigator at discharge should receive, in advance of arrival of the ship, information from the Fumigator at loading or the receivers or the agents. This should include the method and type of fumigation employed.

13.3 The Fumigator must consider the information received as well as any local health regulations and other port requirements.

13.4 At all times during the ventilation procedure, all crew members and other interested parties must comply with the instructions issued by the Fumigator. The Fumigator should issue safety instructions to the crew and other interested parties, who must comply, for the duration of the ventilation procedure.

13.5 The Fumigator must remove any retrievable fumigant residues (bags, sleeves, blankets etc) and convey them away from the shipment and port without delay to be disposed of safely in accordance with local requirements.

13.6 The Fumigator should remain on board to advise and assist with venting. The Fumigator must carry out periodic gas readings.

13.7 The decision to issue the Clearance or Gas Free Certificate should take into account a range of factors including the method and period of fumigation, discharge and storage procedure.

13.8 If necessary further gas checking should be carried out in store to check possible gas desorption from the commodity.
Appendix A – Gafta Approved Register of Fumigants
Requirements and Code of Conduct

Introduction
Where goods are traded on Gafta contracts, and the Gafta Fumigation Rules No. 132 are incorporated, Traders are required to appoint Fumigators from the current Gafta Register of Approved Fumigators who comply with the Gafta Requirements and Code of Conduct for the Register of Approved Fumigators, and are members of Gafta.

It is a recommendation of the Gafta Standard for Fumigation and Pest Management that a Fumigator listed on the Gafta Approved Register of Fumigators is responsible for degassing at the discharge port.

This document should be read in conjunction with the Gafta Fumigation Rules No. 132, the Gafta Standard for Fumigation and Pest Management, the General Code of Conduct Applicable to all Members, the General Rules and Regulations Applicable to all Members, and the Membership Complaints and Disciplinary Regulations.

Scope
The Gafta Approved Register of Fumigators approves the management and operational procedures of the Fumigator (and his trained representatives) when carrying out the fumigation and degassing of agricultural commodities on a ship, in a store-room or in freight containers in relation to food/feed safety. It details best practice procedures of the Fumigator within the scope of his responsibility, including the handling over of responsibility to the owner or custodian of the commodity when required. It does not guarantee the success of the fumigation or treatment and relates only to the effort of the application.

Disclaimer
For the avoidance of any doubt, Gafta does not accept any liability, however arising, including in contract and/or in tort (including, without limitation, in negligence), for any loss or damage arising directly or indirectly from or out of (a) any work undertaken by any Gafta Approved Analyst, Fumigator or Superintendent and/or (b) directly or indirectly from or out of any matter arising from any information contained in this Register.

Definitions
Fumigation is the process of application, exposure and dissipation of a toxic chemical in its gaseous state with the purpose of control of target insect pests in the product and its enclosure.

Fumigator is the appointed fumigation company including the Fumigator-in-Charge and his trained technicians.

Requirements
In order to be listed on the Gafta Approved Register of Fumigators evidence must be provided that the following criteria are met:

1. Membership of Gafta under Category J – Fumigation Operators
2. Valid certificate of compliance with the Gafta Standard for Fumigation and Pest Management. OR valid certificate of compliance with an equivalent scheme recognised by Gafta.

Certification to the Gafta Standard for Fumigation and Pest Management is conditional on a successful audit assessment by the Certification Body/Bodies approved and appointed by Gafta. Continued certification is conditional on successful annual audits of the Gafta Standard for Fumigation and Pest Management not later than 14 months of the anniversary of the initial audit.

Requirements of a Member

Members are listed on the Gafta Approved Register of Fumigators for 12 months after which time continuation is dependent on provision of renewed evidence of the above criteria.

Listing on the Gafta Approved Register of Fumigators does not replace any legislative or health and safety requirements applicable the country the activity is carried out.

Different arrangements may be permitted under equivalent schemes recognised by and agreed with Gafta. Gafta members wishing to be listed on the Gafta Approved Register of Fumigators through recognition of an equivalent scheme must provide evidence of the equivalence or higher of the scheme against the Gafta Standard. This will be considered and agreed by the Gafta Superintendents and Fumigators Committee and their recognition provided in writing to the Member before they can become listed on the Gafta Approved Register of Fumigators. Should the Gafta Superintendents and Fumigators Committee decide the scheme is not equivalent or higher, or does not match the requirements and spirit of the Gafta Standard, the Member will be informed and will be required to meet the requirements of the Gafta Standard before being listed on the Gafta Approved Register of Fumigators.

Complaints Procedure, Suspensions and Withdrawals
It is a requirement of the Gafta Approved Register of Fumigators that Fumigators abide by the General Code of Conduct, Rules and Regulations of Gafta as listed above. Any Fumigator found to have acted contrary to any provision of this Code of Conduct or the General Code of Conduct, Rules and Regulations of Gafta as listed above, or to their spirit, may be subject to disciplinary action under the Gafta Membership Complaints and Disciplinary Regulations.

Any company wishing to make a complaint against a Member of the Gafta Approved Register of Fumigators must put it in writing to the Director General. Any such complaint must be made with 12 months of the complainant’s date of knowledge of the complaint and should not involve a complaint which has previously been determined elsewhere including, but not limited to, before an arbitration panel and/or the Courts.

The Director General can initiate a complaint of his/her own volition where he/she becomes aware of any fact or matter concerning the conduct of a Member which in his/her opinion warrants inquiry under the terms of the Membership Complaints and Disciplinary Regulations.

Any complaints raised at audit of the Gafta Standard must be closed by providing documentary evidence or a report. Non-conformances must be closed within three months of an initial audit and within 28 days of any subsequent audit. Failure to provide satisfactory evidence will result in suspension from the Gafta Approved Register of Fumigators and may lead to inquiry under the terms of the Membership Complaints and Disciplinary Regulations.

Gafta and the appointed Certification Body reserves the right to suspend or withdraw membership of the Gafta Approved Register of Fumigators when it considers it necessary to do so to prevent the Register or the Association being brought into disrepute.

Any suspected misuse of the logo or any suspected false claim regarding the Gafta Approved Register and/or the Gafta Standards should be reported to Gafta immediately.

Use of the logo
Fumigators meeting the requirements of this Code of Conduct shall be permitted to indicate that they are listed on the Gafta Approved Register of Fumigators and able to provide their services under Gafta contracts where Gafta Fumigation Rules No. 132 are incorporated.

Fumigators meeting the requirements of this Code of Conduct shall be permitted to use the Gafta Approved Register of Fumigators logo in accordance with direction from Gafta provided in the Brand Guidelines forGafta Approved Register Logos. The permission is personal to the Approved Fumigator and may not be transferred or licensed to any other business.

Fumigators not abiding by the requirements of this Code of Conduct or the Brand Guidelines for Gafta Approved Register Logos will be given one month’s notice, in writing, to take remedial action before the Fumigator is suspended or withdrawn from the Gafta Approved Register of Fumigators. Gafta reserves the right to take immediate action where the use of the logo is grossly misleading or it considers it necessary to do so to prevent the Register or the Association being brought into disrepute.

Failure to reinstate from ‘suspended’ status within 28 days of notification of the suspension will result in the Fumigator being withdrawn from the scheme. After withdrawal, reinstatement will only be possible after a full initial audit at the cost of the Fumigator.

Failure to make payment of annual membership and audit fees will result in withdrawal from the Gafta Approved Register of Fumigators. Failure to complete the annual audit within 14 months of the anniversary of the initial audit will result in suspension and subsequently withdrawal after a further 28 days.
Appendix B – Phosphine Application Methodology

A summary of the various methods of phosphine application methodology that can be considered for in-transit fumigation of bulk or bagged cargo in ships holds.

i) Application of tablets or pellets to cargo surface (or into the top half meter). High concentrations of gas build up in the head space, potentially resulting in a lot of leakage through the hatch covers unless they are very well sealed. Very little penetration down into the cargo. Powdered residues cannot be removed.

ii) Application of tablets or pellets by probing into the cargo a few meters. Less loss of gas through hatch covers than in i). Better penetration of gas than when applied on surface only but unlikely to be fully effective unless holds are relatively shallow and voyage time relatively long. Powdered residues cannot be removed.

iii) Application of tablets or pellets by deep probing into the full depth of the cargo. This is difficult to achieve and currently practically impossible if the cargo is more than 10 metres deep. Ensures effective fumigation provided voyage time is relatively long to allow gas to distribute. Powdered residues cannot be removed.

iv) Application of aluminium phosphide in blankets, sachets or sleeves on the surface or probed a few metres into the cargo a few meters. This is being developed but is not yet fully available. Will enable good distribution of gas to be achieved without the requirement for a powered re-circulation system, provided the voyage is long enough.

v) Application of tablets or pellets by probing into the cargo a few meters in retrievable sleeves. All points as for iii) except that with this method powdered residues can be removed prior to discharge.

vi) Fitting of an enclosed powered re-circulation system to the hold and application of aluminium phosphide tablets or pellets to the surface will ensure the gas is distributed throughout the cargo evenly and rapidly making maximum use of the fumigant in the shortest possible time. Powdered residues cannot be removed.

vii) Fitting of an enclosed powered re-circulation system to the hold and application of aluminium phosphide in blankets, sachets or sleeves on the surface or probed into the top one or two metres. As for vii) except that with this method, powdered residues can be removed. Also gaseous residues can be removed more easily than with other methods, as once the powdered residues have been removed the re-circulation system can be used to assist this to happen rapidly.

Fumigation of cargo in ship’s hold using phosphine and a powered re-circulation system

The re-circulation system consists of a permeable tubular loop placed in the lower part of a hold prior to commencement of loading operations. The tubular loop is connected via an impermeable tube/hose to the headspace of the hold, this is to ensure that the gas is homogeneously and rapidly distributed throughout the cargo. The mixture of gas and air is circulated by a spark proof ventilator.

Traditional fumigation of cargo in ship’s hold using phosphine

The diagrams opposite compare the distribution pattern from a powered re-circulation system with fumigation and no re-circulation.

Fan

Phosphine drawn from surface to bottom of hold

Phosphine permeates through cargo as re-circulation continues

Phosphine applied on surface

Phosphine applied on surface or probed a few metres into the cargo

Gas movers down very slowly from surface

After 5–7 days, some gas should reach 10–12 metres at effective concentrations

Gas is very unlikely to reach 15–20 metres in effective concentrations however long the voyage
**Appendix C – Example of Schematic Fumigation Plan**

<table>
<thead>
<tr>
<th>Vessel Name:</th>
<th>Date of Fumigation:</th>
<th>Place of Fumigation:</th>
<th>Port of Destination:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fumigant Used</th>
<th>Aluminium Phosphide (AlP)</th>
<th>Magnesium Phosphide (MgP)</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Application</td>
<td>Short Probe</td>
<td>Long Probe</td>
<td>Residue retaining sleeves</td>
</tr>
</tbody>
</table>

Annotate amounts of fumigant blankets, sleeves, plates, sachets, ducts, pipes or fans placed in each hold:

<table>
<thead>
<tr>
<th>Hold 1</th>
<th>Hold 2</th>
<th>Hold 3</th>
<th>Hold 4</th>
<th>Hold 5</th>
<th>Hold 6</th>
<th>Hold 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume: 0000 m³</td>
<td>Volume: 0000 m³</td>
<td>Volume: 0000 m³</td>
<td>Volume: 0000 m³</td>
<td>Volume: 0000 m³</td>
<td>Volume: 0000 m³</td>
<td></td>
</tr>
<tr>
<td>AlP/MgP 0.00 kgs</td>
<td>AlP/MgP 0.00 kgs</td>
<td>AlP/MgP 0.00 kgs</td>
<td>AlP/MgP 0.00 kgs</td>
<td>AlP/MgP 0.00 kgs</td>
<td>AlP/MgP 0.00 kgs</td>
<td></td>
</tr>
</tbody>
</table>

Total volume = 0000 m³ Total fumigant AlP/MgP = 00 kgs

It is hereby certified that the above mentioned fumigant formulation was applied to the above vessel on (date). After the application of the fumigant all holds were closed and sealed and warning placards posted on all entrances to all fumigated holds. The cargo was treated at the rate of (00) grams of active ingredient per cubic metre of hold space using the () method.

Total amount of residue retaining sleeves (if applicable): Required minimum exposure time:

Estimated voyage time:

Date: Port: Fumigator-in-charge: Master:

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**Appendix D – Properties of Ordinarily Used Fumigants**

<table>
<thead>
<tr>
<th>Molecular weight</th>
<th>Specific Gravity Air = 1</th>
<th>Boiling Point (°C)</th>
<th>Flammability By Volume in Air (%)</th>
<th>Water Solubility ppm</th>
<th>Odour as Gas</th>
<th>Incompatibility – Liquid or Solid</th>
<th>Incompatibility – Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphine – (PH₃)</td>
<td>34.04 g</td>
<td>1.21 at 0°C, 18% heavier than air</td>
<td>-87.4°C</td>
<td>1.79% by volume of air</td>
<td>416 ppm at 17°C (very slightly soluble)</td>
<td>Carbide or garlic-like odour due to impurities, contaminant, ammonia in certain formulation</td>
<td>Exothermic reaction with moisture or acid. Solid metal phosphate formulations can spontaneously ignite if contacted by water, acids, or chemicals.</td>
</tr>
</tbody>
</table>

| Methyl Bromide – (CH₃Br) | 94.94 g | 3.27 at °C, three times heavier than air | Non-flammable | Non-flammable | 15,444 ppm at 25°C | None (sickly sweet odour in high concentrations). | Contact of liquid with aluminium, magnesium, zinc and alkali metals may result in liberation of toxic gases and possible fire and explosion. Liquid incompatible with plastics, like polyvinyl. Liquid may react with sulphur compounds to create stench. | In high concentrations, gas may react with sulphur compounds to create stench. Decomposes in flame, glowing filament to produce HBr. When pure, non-corrosive to metals. |

DRAFT
Contact

The Grain and Feed Trade Association

**London** (head office)
9 Lincoln’s Inn Fields
London WC2A 3BP
UK
T: +44 20 7814 9666
F: +44 20 7814 8383
E: post@gafta.com
www.gafta.com

**Geneva**
Route de Meyrin 123
c/o BDO SA
1219 Chatelaine
Switzerland
T: +41 79 43 43 528
E: geneva@gafta.com
www.gafta.com

**Beijing**
1-1-1607
Leading International Center
No.1 Guang Qu Men Nan
Xiao Jie, ChongWen District
100061
Beijing
China
T: +86 10 6712 1741
F: +86 10 6712 1742
E: beijing@gafta.com
www.gafta.com.cn

**Kiev**
Business Center “Saksaganskiy”,
70A Saksaganskogo Str.
Kyiv
Ukraine
01032
T: +38 044 290 82 90
F: +38 044 290 82 94
E: kiev@gafta.com
www.gafta.kiev.com

**Singapore**
1 Raffles Place Tower One
Level 24
Singapore
048616
T: +65 9017 4205
F: +44 (0) 20 7814 8383
E: post@gafta.com
www.gafta.com

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