



The Gafta Standard for
Fumigation

Contents

A Introduction	4
B Scope – The Gafta Standard for Fumigation	4
C General Terms and Definitions	5
D Specific Terms and Definitions	6
1 General Obligations and Requirements	8
2 Complaints Procedure	8
3 Insurance	8
4 Risk Assessment and Hazard Analysis and Critical Control Points (HACCP)	9
5 Health and Safety Regulations for Employees	9
6 Equipment	9
7 Training	9
8 Fumigation in Ships' Holds using Phosphine	10
9 In-Port Fumigation using Methyl Bromide	12
10 Fumigation of Freight Containers	13
11 Store and Silo Fumigation	14
12 Degassing/Venting	15

Appendices

Appendix I – Gafta Approved Register of Fumigators Requirements and Code of Conduct	16
Appendix II – Accepted Methods of Phosphine Application	18
Appendix III – Example of Schematic Fumigation Plan	20
Appendix IV – Properties of Ordinarily Used Fumigants	21

A Introduction

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.

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 Fumigation
- The Gafta Standard for Supervision, Sampling and Weighing.

Certification to the Gafta Standard for Fumigation 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 no later than 14 months of the anniversary of the initial audit.

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 complete a site visit at any annual audit or any other time (e.g. unannounced 'spot checks') where it considers it to be necessary.

If a site visit audit is cancelled or postponed by the Fumigator within 2 weeks of the audit date, 100% cancellation fee applies.

Audits will be conducted in English and it is the responsibility of the Fumigator to arrange suitable independent translation of documents and/or a suitable independent interpreter as required at their cost. Failure to comply with this requirement may result in the rearrangement of the audit when suitable interpreters are available. The costs associated with the rearranged audit shall be borne by the Fumigator.

The Fumigator must permit access to the auditor to the premises, information, documentation and facilities required to undertake the audit. The auditor reserves the right to refuse to carry out an audit where they deem conditions are inappropriate, dangerous or unsafe, the cost of a cancellation due to any of these factors will be borne by the Fumigator. Any certification currently

in place may be suspended if an audit is cancelled and full reinstatement of a certificate may require a full on site audit.

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.

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.

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

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 1.

B Scope – The Gafta Standard for Fumigation

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 agricultural commodities and animal feed materials and the food supply chain.

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 store/silo 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 handing over of responsibility to the owner or custodian of the commodity when required.

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

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

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

This Standard does not replace any legislative or Health and Safety requirements applicable in the country the activity is carried out.

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 of), 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 fumigant application it is impossible to assess the full efficacy of the fumigation before sailing.

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

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.

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.

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 UN3359'. 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.

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 requirement of this Standard that a Fumigator is responsible for degassing at the discharge port, and a recommendation that the Fumigator-at-Discharge is listed on the Gafta Approved Register of Fumigators.

C General Terms and Definitions

Key Standards – Standards marked with a **K** 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.

Major Non-Conformance – a substantial failure to meet a clause of the standard.

Minor Non-Conformance – a clause has not been fully met.

The level of non-conformance against a requirement of the Standard is based upon evidence and observations made during the audit.

Records – where an **R** 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.

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.

D Specific Terms and Definitions

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

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.

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.

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

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 or below safe levels as defined in the relevant safety regulation.

Clearance Certificate (or Gas Free Certificate) – is the certificate confirming presence of harmful concentrations of fumigant is below Threshold Limit Value and is only valid at the time and place of issuance. This is provided by the Fumigator at discharge port after cargo degassing operations are concluded.

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 requirement of this Standard that a Fumigator is responsible for degassing at the discharge port, and a recommendation that the Fumigator-at-Discharge is listed on the Gafta Approved Register of Fumigators.

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.

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.

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

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).

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.

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

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

Gas Tightness – 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 hold 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.

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

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.gafta.com

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.gafta.com

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

Master – the Ships Master and/or his trained representative(s).

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

Removal of Spent Fumigant – 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.

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

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.

TLV – 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.

1 General Obligations and Requirements

- 1.1**  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/guide notes which address the individual requirements for particular logistical operation/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.
- 1.2**  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.
- 1.3**  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.

- 1.4**  In order for Fumigators to perform their activities, precise instructions are needed from their principals at the time of receiving the order.

Fumigators 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-in-Charge. The Technical/File Manager shall be a permanent employee responsible for ensuring that sufficient information has been received to enable the Fumigator-in-charge to satisfactorily carry out his/their duties.

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

- 1.6**  A Fumigator may only contract out an operation (which it has been appointed to carry out) to another Fumigation company certified under the Gafta Standard for Fumigation and/or from the Gafta Approved Register of Fumigators.

2 Complaints Procedure

- 2.1**  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.

3 Insurance

- 3.1**  Fumigators must demonstrate that they have adequate and appropriate insurance in place to cover any claims which may arise as a result of liability in respect of their operations.

4 Risk Assessment and Hazard Analysis and Critical Control Points (HACCP)

- 4.1**  The application of a HACCP approach or risk analysis is central to the Gafta Standard 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 risk assessment should include a procedure for advising the relevant parties regarding any threats to food or feed safety as required by the relevant regulations.
- 4.2**  Risks to be considered must include, but are not limited to, explosion, fire, food/feed safety, intoxication, personnel exposure and poisoning.

5 Health and Safety Regulations for Employees

- 5.1**  The Fumigator is obliged to comply with all relevant local and national Health and Safety Regulations of the country in which it is operating with regard to its employees and any other operatives under its control.
- 5.2**  Fumigators must wear the appropriate Personal Protective Equipment. The items provided must be appropriate to the activities being performed, must be in good order and within any applicable validity period or expiry date. Records should be retained for the issuance and receipt of such equipment to/by Fumigators.
- 5.3**  Where Fumigators are asked to perform their duties in an environment or in conditions deemed by them to be dangerous or unsafe, they shall be obliged to refuse to undertake said duties or operations until such time as the conditions are made safe to their satisfaction. Where a Fumigator refuses to perform an activity or operation due to concerns regarding safety they shall immediately notify the principal accordingly.

6 Equipment

- 6.1**  Equipment must be fit for the purpose for which it is used and maintained and serviced to manufacturers' specifications or tolerances. Maintenance and servicing schedules must be recorded.
- 6.2**  Manufacturers' operating instructions or in-house procedures must be available.
- 6.3**  Equipment must be checked before use on a regular basis.
- 6.4**  Equipment must be calibrated where appropriate according to the manufacturers' instructions or in-house procedures, and records kept. Calibration adjustments must only be undertaken by authorised and trained personnel.

7 Training

- 7.1**  Fumigators must have a regularised training programme for its personnel. 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.
- 7.2**  Training programmes must be regular and updated as appropriate.
- 7.3**  Written training programmes must be implemented and include the following stages:
- Induction period
 - Supervised/mentored working period with experienced operators
 - Continued training to remain up to date with changing technology, methods, legislation etc.
- 7.4**  Records of all training must be kept by the Fumigator
- 7.5**  The requirement to attend or receive training must take into account the ability, experience and other qualifications held by each employee and shall be appropriate to their activities. Performance monitoring must be used as a means of identifying training needs.

7.6 Training is recommended to cover at least, but not limited to, the following areas of activity:



- All relevant codes and regulations including, but not limited to, those listed in Section 1 – General Obligations and Requirements
- The requirements of the Gafta Standard for Fumigation
- The applicable Gafta Contract terms and Gafta Rules
- Health and Safety requirements
- Fumigants and products used by the Fumigator.

8 In-transit Fumigation of Bulk and Bagged Cargo in Ships' Holds with Phosphine

Note: The use of Methyl Bromide for in-transit fumigation is not permitted by IMO Recommendations.

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).

8.1 Obligations on the Parties:

When the owners/charterers/Master agree to fumigation being carried out in-transit with phosphine, the Master should ensure he is familiar with the relevant requirements of IMO Recommendations. The Fumigator must ensure the Master is clear on the obligations of both the Fumigator and the Master.

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 Fumigator's obligation to make the Master and ship's crew aware of their responsibilities.

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.

It is recommended that all parties involved are familiar with the recommendations given in the IMO Safe Use of Pesticides on Ships Guide.

8.2 Before fumigant application:

8.2.1



The Master must appoint a competent crew member to accompany the Fumigator during the inspections/testing of empty holds prior to loading to determine whether they are gas tight, or can be made gas tight and if necessary what work is to be carried out to ensure they are gas tight.

8.2.2



The Fumigator must receive written confirmation that the Master and/or the crew have searched the vessel thoroughly to ensure there are no stowaways or other unauthorised personnel on board before fumigation takes place.

8.2.3



The Fumigator must carry out a safety assessment at load port taking into account the IMO Recommendations and also any limitations applied by the law of the country of loading and destination or flag of the ship, and any contract information provided to the Fumigator (see requirement 1.4), or to the ship owner's instructions. 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. All necessary measures must be taken to ensure the safety of the vessel and crew with regards to fumigation operations.

8.2.4



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

8.2.5



The Fumigator must ensure the Master has briefed the crew on the fumigation process before fumigation takes place. The Master must appoint at least two members of crew to be trained by the Fumigator. The crew members must maintain safe conditions on board the ship during the voyage.

8.2.6



The Fumigator must ensure that the Master has been made familiar with the fumigant procedure label, detection methods, safety procedures and emergency procedures. This may include, but is not limited to, the provision of Safety Datasheets.

- 8.2.7**  The Fumigator should verify that gas detection and Respiratory Protection Equipment (RPE) (as required by IMDG and IMO recommendations) carried on the ship are all in good working order and are suitable and appropriate for the task, and that adequate fresh supplies of consumable items for this equipment are available to allow proper measurement.
- 8.2.8**  In case of regulatory requirements RPE may consist of Self Containing Breathing Apparatus. Canister respirators should be properly selected for the fumigant used and not expired. Fumigators should make sure that four sets of RPE are on board as well as gas monitoring equipment suitable for the length of the voyage.
- 8.2.9**  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 fulfils its responsibility to carry sufficient items.
- 8.2.10**  The Fumigator must ensure that, in accordance with IMDG and IMO Recommendations, the vessel is carrying the necessary medicines and medical equipment, and the latest version of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG).
- 8.2.11**  The Fumigator must ensure that the Master has been notified in writing of the spaces containing fumigated cargo.
- 8.2.12**  The Fumigator must ensure that the Master has been notified in writing of any other spaces that are considered unsafe, or could become unsafe to enter during the fumigation.
- 8.2.13**  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. Guidance criteria are available in a number of guide notes and handbooks. Other National Plant Protection Organisation requirements may apply.
- 8.3** **Following fumigant application:**
- 8.3.1**  The Fumigator must ensure that the Master or his trained representatives have been made aware of the specific areas to be checked for gas concentrations throughout the fumigation period.
- 8.3.2**  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 available.
- 8.3.3**  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.
- 8.3.4**  The Fumigator must ensure that the Master or 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.
- 8.3.5**  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.
- 8.3.6**  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.
- 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 Recommendations). If any leakage is detected, appropriate precautions to avoid any crew being exposed to harmful concentrations must be taken.

8.3.7  The Fumigator should 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.

8.3.8  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 III
- 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.

8.3.9  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 Recommendations).

The Master may start the ventilation of the cargo spaces prior to arrival at the first discharge port, only if requested to do so by the Fumigator, taking into account instructions issued by the Fumigator.

Prior to arrival at the first discharge port the Master should inform the authorities at the port that the cargo has been fumigated in-transit (IMO Recommendations).

8.3.10  The Master, Fumigator or relevant authorities should not allow discharge of the cargo to commence until they are satisfied that the cargo has been correctly ventilated (see Section 12) and metal phosphide residues that can be removed, have been removed, and that any other requirements of the discharge port have been met (IMO Recommendations). Retrievable residues should only be handled or removed by a Fumigator.

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

9 In-Port Fumigation using Methyl Bromide

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 7 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.

Note: Where phosphine is used for in-port fumigation, the requirements in Section 8 are applicable.

- 9.1**  The Fumigator must receive written confirmation that the Master and/or the crew have searched the vessel thoroughly to ensure there are no stowaways or other unauthorised personnel on board before fumigation takes place.
- 9.2**  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.
- 9.3**  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. 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. All necessary measures must be taken to ensure the safety of the vessel and crew with regard to fumigation operations.
- 9.4**  The Fumigator must ensure that all the cargo spaces to be fumigated are suitable for fumigation.
- 9.5**  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. Guidance criteria are available in a number of guide notes and handbooks. Other National Plant Protection Organisation requirements may apply.
- 9.6**  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 (see Section 12) and that any other requirements of the discharge port have been met (IMO Recommendations).

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

10 Fumigation of Freight Containers

- 10.1**  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.
- 10.2**  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.
- 10.3**  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. Guidance criteria are available in a number of guide notes and handbooks. Other National Plant Protection Organisation requirements may apply.
- 10.4**  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 Threshold Limit Value (TLV)'.

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.

- 10.5**  Containers which have been fumigated and ventilated must be labelled according to IMO Recommendations.

10.6 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 – Dangerous Goods as 'FUMIGATED UNIT CLASS 9 UN 3359'.



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.

10.7 It is a recommendation of this Standard that the paperwork accompanying containers which are fumigated in-transit should include appropriate opening/ventilation instructions, and that ventilation and gas monitoring is carried out by a Fumigator or competent authority.



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 recommended to ensure the Exporter/Agent is aware of his obligations.

11 Store and Silo Fumigation

11.1 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.



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

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

11.2 The Fumigator must ensure that the store/silo is 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. Guidance criteria are available in a number of guide notes and handbooks. Other National Plant Protection Organisation requirements may apply.



11.4 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 Threshold Limit Value' (TLV).



Note: A 'certificate confirming presence of harmful concentrations of fumigant is below Threshold Limit Value' (TLV) 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.

12 Degassing/Venting

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

12.1  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.

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

12.3  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.

12.4   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. A record should be kept of how residues have been disposed.

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

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.

12.6  If necessary further gas checking should be carried out in-store to check possible gas desorption from the commodity.

Appendix I – Gafta Approved Register of Fumigators 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 by the contract to appoint Fumigators from the current Gafta Approved Register of Fumigators who comply with the Gafta Requirements and Code of Conduct for the Gafta Approved Register of Fumigators, and are members of Gafta.

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

This document should be read in conjunction with the Gafta Fumigation Rules No.132, the Gafta Standard for Fumigation, 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/silo 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 handing 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 process of the application.

Disclaimer

For the avoidance of any doubt, Gafta does not accept any liability, howsoever 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 Fumigator and/or (b) directly or indirectly from or out of any matter arising from any information contained in the 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 technician(s).

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, OR valid certificate of compliance with an equivalent scheme recognised by Gafta.

Certification to the Gafta Standard for Fumigation 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 not later than 14 months of the anniversary of the initial audit.

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. On expiry of the validity period of a certificate a period of three months is allowed for delivery of an updated certificate to Gafta. After the expiry of a three month period companies without a valid certificate will be removed from the Register until a valid certificate is provided.

Listing on the Gafta Approved Register of Fumigators does not replace any legislative or Health and Safety requirements applicable in 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 compared to 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 and the 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 Gafta Approved Fumigator must put it in writing to Gafta or the Certification Body. Any such complaint must be made within 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.

Complaints relating to this Standard will be dealt with by the Certification Body's Complaints and Appeals process.

Non-conformances raised at 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 Membership Complaints and Disciplinary Regulations.

Gafta and the appointed Certification Body reserves the right to suspend or withdraw certification and/or membership of the Gafta Approved Register of Fumigators when it considers it necessary to do so to prevent the Standard, 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.

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 for Gafta Approved Register Logos. The permission is limited 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 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.

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.



Appendix II – Accepted Methods of Phosphine Application

A summary of the various methods of phosphine application methodology that can be considered for 'in-transit' fumigation of bulk or bagged cargoes in ships' holds and the key elements of each are listed below.

Note: These methods can also be used for store and silo fumigation when the appropriate gas-tight sheeting or other sealing materials are used.

The criteria that are relevant in respect of the fumigation are (Inter alia):

- Type of fumigant product and formulation used
- Application method
- Exposure time
- Conditions: temperature/moisture
- Type and volume of cargo/product.

i) Surface tablet/pellet application – is the application of tablets or pellets of a metal phosphide on the cargo surface worked into the cargo/below the surface/not scattered on the surface/buried.

High concentrations of gas build up in the head space, potentially resulting in significant leakage through the hatch covers unless they are very well sealed. Penetration down into the cargo is limited. Powdery residues cannot be removed."

ii) Surface blanket application – is the application of metal phosphide in blankets, sachets or sleeves, placed on the surface of the cargo (or into the top half metre).

All points the same as (i) except that with this method powdery residues can be removed prior to discharge.

iii) Fumigation by probing – is the application of tablets or pellets by probing into the cargo of at least 0.3 m depth up to a few metres. There is less loss of gas through hatch covers than in (i). Better penetration of gas is experienced compared to applications on the cargo (sub-)surface. The procedure is only fully effective if the holds are relatively shallow and voyage time relatively long. Powdery residues cannot be removed.

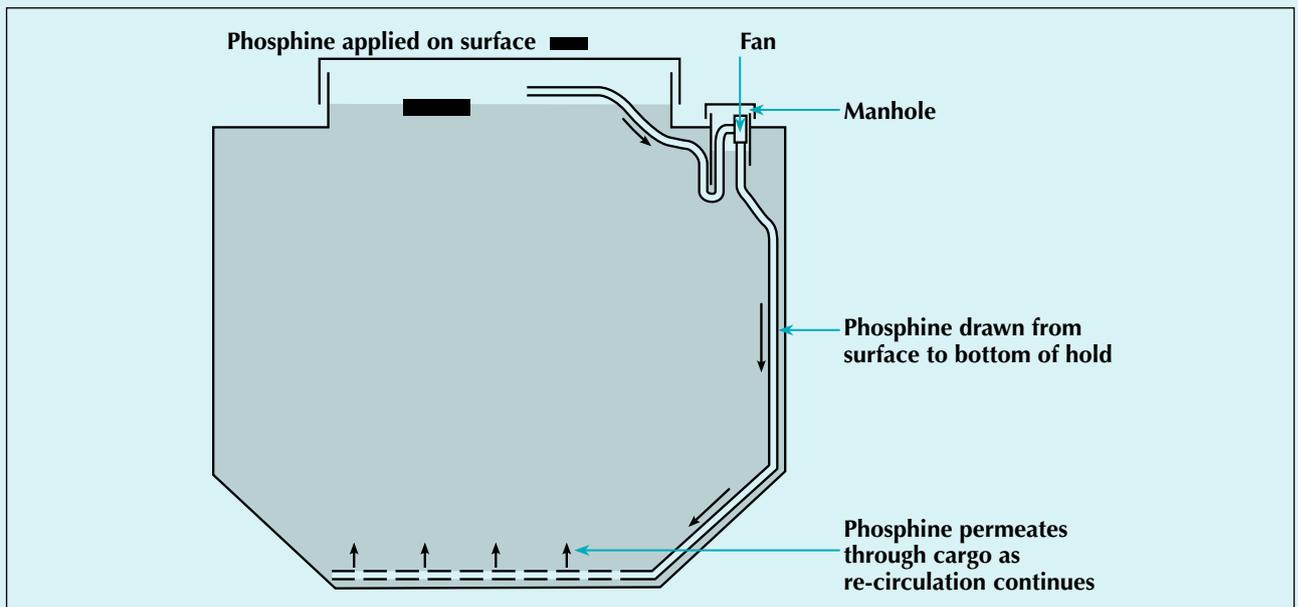
iv) Probing sleeve application – is the application of tablets or pellets by probing into the cargo a few metres in retrievable sleeves. All points as for (iii) except that with this method powdery residues can be removed prior to discharge.

v) Surface application with re-circulation – is the fitting of an enclosed powered re-circulation system to the hold and application of metal phosphide tablets or pellets to the surface. This to ensure the gas is homogeneously and rapidly distributed throughout the cargo. Powdery residues cannot be removed.

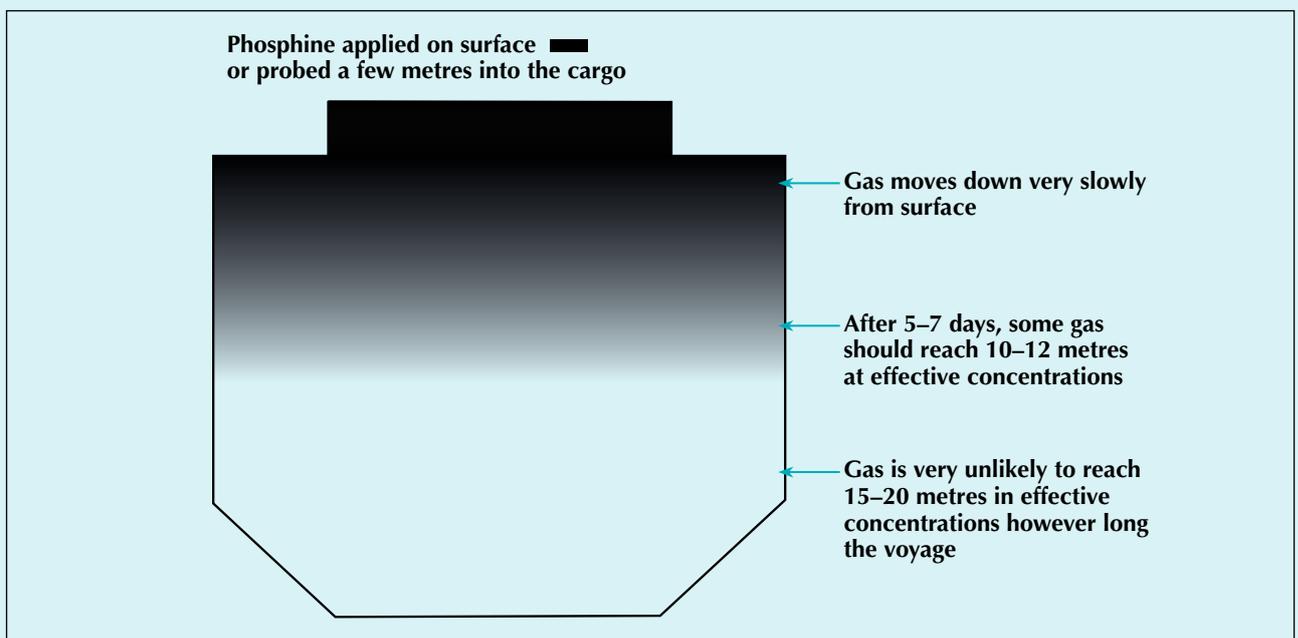
The re-circulation system consists of a permeable tubular loop placed in the lower part of a hold prior to commencement of loading operations. The tubular loop is connected via an impermeable tube/hose to the headspace of the hold. The mixture of gas and air is circulated by a spark proof ventilator.

vi) Probing sleeve/blanket application with re-circulation – is the fitting of an enclosed powered re-circulation system to the hold and application of metal phosphide in blankets, strips, sachets or sleeves on the surface or probed into the top one or two metres. As for (v) except that with this method, powdery residues can be removed. Also gaseous residues can be removed more easily than with other methods, as once the powdery residues have been removed the re-circulation system can be used to assist in the evacuation of the gas.

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.



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



Traditional fumigation of cargo in ship's hold using phosphine

Appendix III – Example of Schematic Fumigation Plan

Vessel Name:

Date of Fumigation:

Place of Fumigation:

Port of Destination:

Fumigant Used:	Aluminium Phosphide (AIP)	Magnesium Phosphide (MgP)	Other:		
Method of Application	Short Probe	Long Probe	Residue retaining x sleeves	Surface application re-circulation	Other re-circulation method

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

Hold 1	Hold 2	Hold 3	Hold 4	Hold 5	Hold 6	Hold 7
Volume 0000 m ³	Volume 0000 m ³	Volume 0000 m ³	Volume 0000 m ³	Volume 0000 m ³	Volume 0000 m ³	Volume 0000 m ³
AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs	AIP/MgP 00.0 kgs
No. Retaining sleeves:	No. Retaining sleeves:	No. Retaining sleeves:	No. Retaining sleeves:	No. Retaining sleeves:	No. Retaining sleeves:	No. Retaining sleeves:
Total volume = 0000 m³ Total fumigant AP/MP = 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 (x) method.

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

Estimated voyage time:

Date:

Port:

Fumigator-in-charge:

Master:

Appendix IV – Properties of Ordinarily Used Fumigants

Molecular weight	Specific Gravity Air = 1	Boiling Point (°C)	Flammability By Volume in Air (%)	Water Solubility ppm	Odour as Gas	Incompatibility – Liquid or Solid	Incompatibility – Gas
Phosphine – (PH³)							
34.04 g	1.21 at 0°C 18% heavier than air	-87.4°C	1.79% by volume of air	416 ppm at 17°C (very slightly soluble)	Carbide or garlic-like odour due to impurities, contaminant, ammonia in certain formulation.	Exothermic reaction with moisture or acid. Solid metal phosphide formulations can spontaneously ignite if contacted by water, acids, or chemicals.	Can corrode copper, brass, copper alloys and precious metals such as gold and silver. Can react with metallic salts on photographic film.
Methyl Bromide – (CH³Br)							
94.94 g	3.27 at 0°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.

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.gaftakiev.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



Registered in England and Wales with liability limited
by guarantee under Company no. 1006456.

VAT Registration No. GB 243 8967 24