


Risks of Cargo Fumigation with toxic gasses - Cooperation with the supply chain

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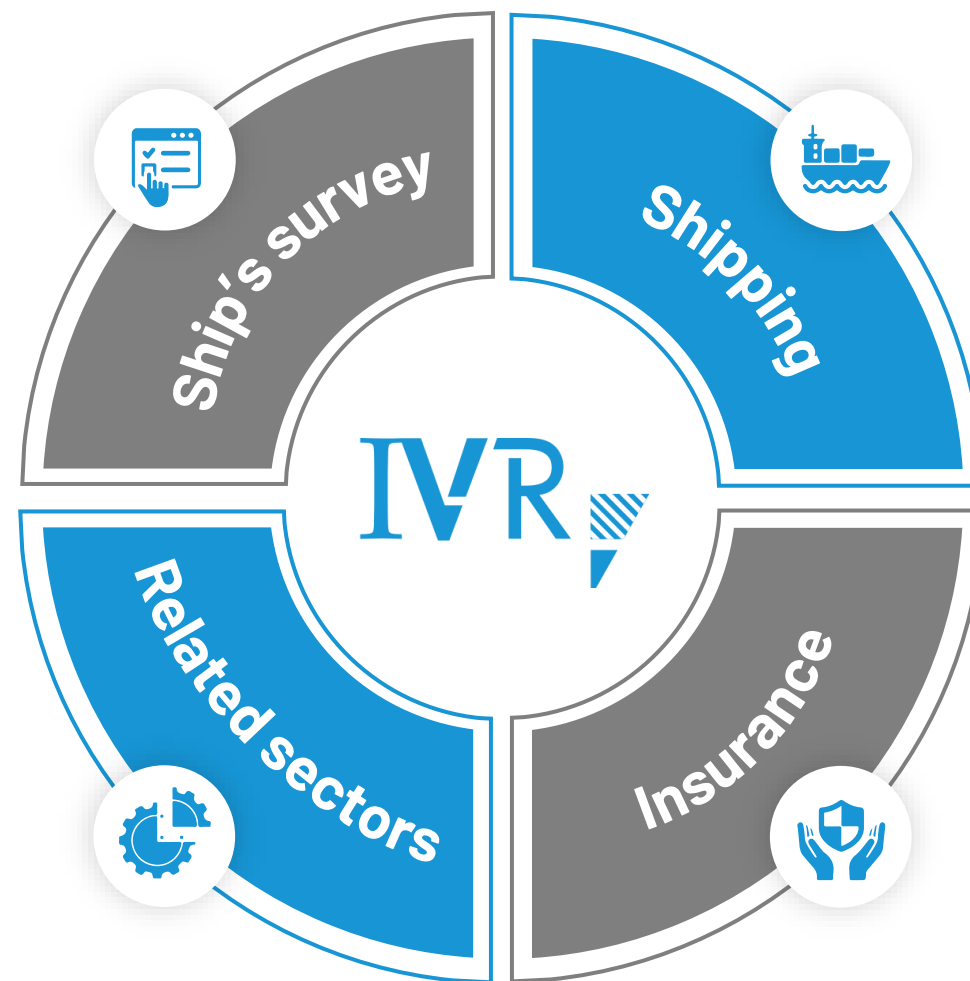


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Role and Position IVR

International Association for the representation of the mutual interests of the inland shipping and the insurance and for keeping the register of inland vessels in Europe



Mission IVR



- IVR is the unique international platform at which national organisations of inland navigation, insurance industry and surveyors as well as individual companies and persons from these and related areas such as brokers, lawyers, manufacturers, yards etc. are represented.
- IVR has been founded initially in 1877 by insurance companies and re-established in 1947 with representatives of inland navigation, surveyors and related industries.
- IVR's main objective is the observation and representation of the common interests of the involved industries on the network of the major European inland waterways. Inland navigation plays an important role within the European transport and mobility system. IVR is copying with all topics within the common sphere of interests of its members. It is characterised by its neutrality and independence.



EXPERTISES IVR



International Representation

Representation of the organisation at EU level, international river commissions and UNEGE



Platform & Events

International independent platform, sharing knowledge and organising networking events such as a congress, colloquia and workshops



Legal

Harmonisation & Unification of law



Loss Prevention Inspection

Loss Prevention Inspections on behalf of the insurability of inland navigation



Steering Gear Inspections

Independent certification of steering gear inspection



Engine Registration System

Initiated by several major insurers the IVR developed the present Engine Registration System (ERS)



IVR Ships Information System

Up-to-date vessel database concerning the European inland shipping fleet



Project



Cargo Fumigation by Phosphine Gas



CARGO FUMIGATION BY PHOSPHINE GAS

IVR
Technical leaflet

FUMIGATION:

The process of releasing toxic gasses into a cargo hold or compartment for the purpose of eliminating or avoiding infestation by live insects or other pests that may cause cargo deterioration.

PHOSPHINE GAS:

The most commonly used fumigant is phosphine gas, a gas that is also very toxic for humans. The European Indicative Occupational Exposure Limit (IOEL) Time Weighted Average (TWA) is 0.1 ppm, and the Short Term Exposure Limit (STEL) is 0.2 ppm. Symptoms have been reported in workers exposed intermittently to concentrations up to 35 ppm, and 290 to 430 ppm would be dangerous to life after 1 hour.

OEL TWA:

Time-weighted average concentration for a conventional 8-hour working day and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect.

OEL STEL:

15-minute time-weighted average of the airborne concentration of a chemical substance unless otherwise stated. It should not be exceeded at any time even though the 8-hour time-weighted average exposure is within the OEL TWA. Exposures above the OEL TWA up to OEL STEL should not be more than 15 minutes and no more than 4 times a day. A minimum of 60 minutes should be allowed between successive exposures in this range.

IN-TRANSIT FUMIGATION:

Phosphine is only fully effective if a lethal concentration is maintained for a period of time between 3 days and 3 weeks. This is the time needed for the gas to penetrate throughout the entire cargo heap. This period depends on the dimensions of the cargo heap, temperature and moisture and is to be assessed upon application by a professional.

Because of the time needed, in-transit fumigation is preferred by shippers and charterers because it reduces time in port. In-transit fumigation is done on board of sea-going ships, but it is also observed on rail-cars and even trucks arriving from Eastern Europe.

ALUMINUM PHOSPHIDE TABLETS

RISK FOR INLAND SHIPPING:

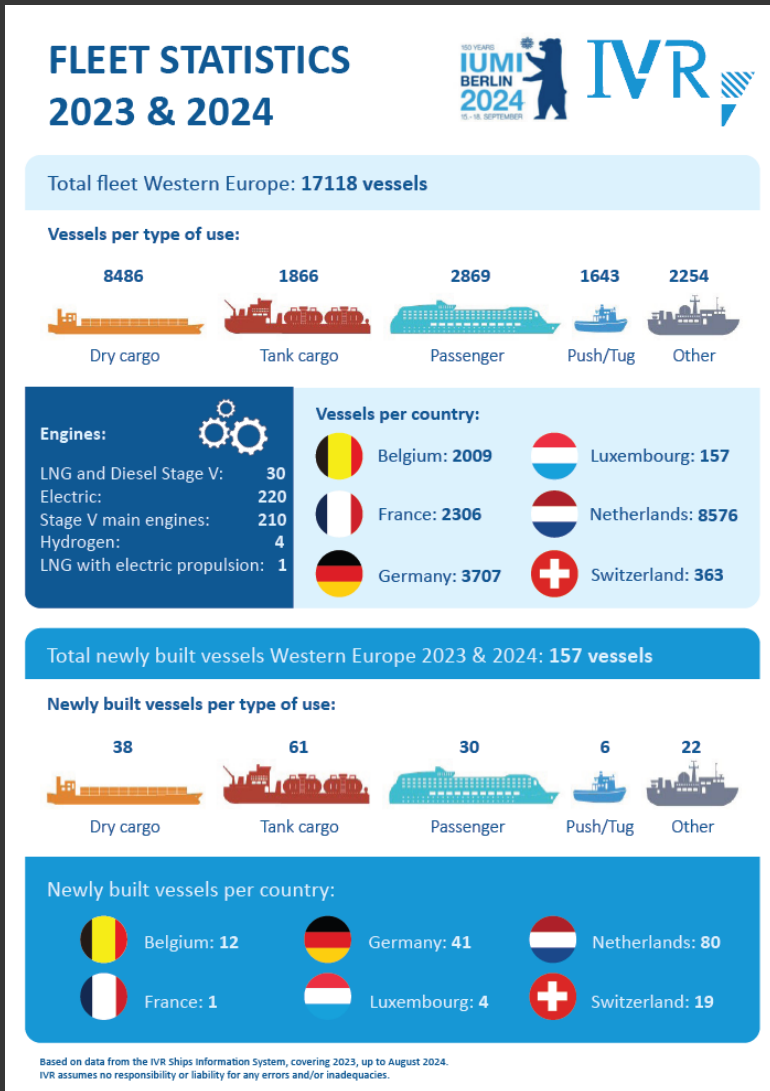
As a gas, but most commonly in the form of aluminium phosphide tablets react with moisture, to form phosphine gas and aluminium phosphide. As long as the tablets are not fully dissolved, they should be dissolved before loading foodstock or in-transit, they should be packed in a way that they can be easily removed before discharge. They should be tested by a professional before discharge, and not be released.

Be aware of the early symptoms of phosphine poisoning: headache, dizziness, nausea, vomiting, diarrhoea, drowsiness, cough and/or chest tightness. Realise that some of these symptoms might be easily underestimated as they are not life-threatening. Also pay attention to pets: they are often affected sooner than humans.

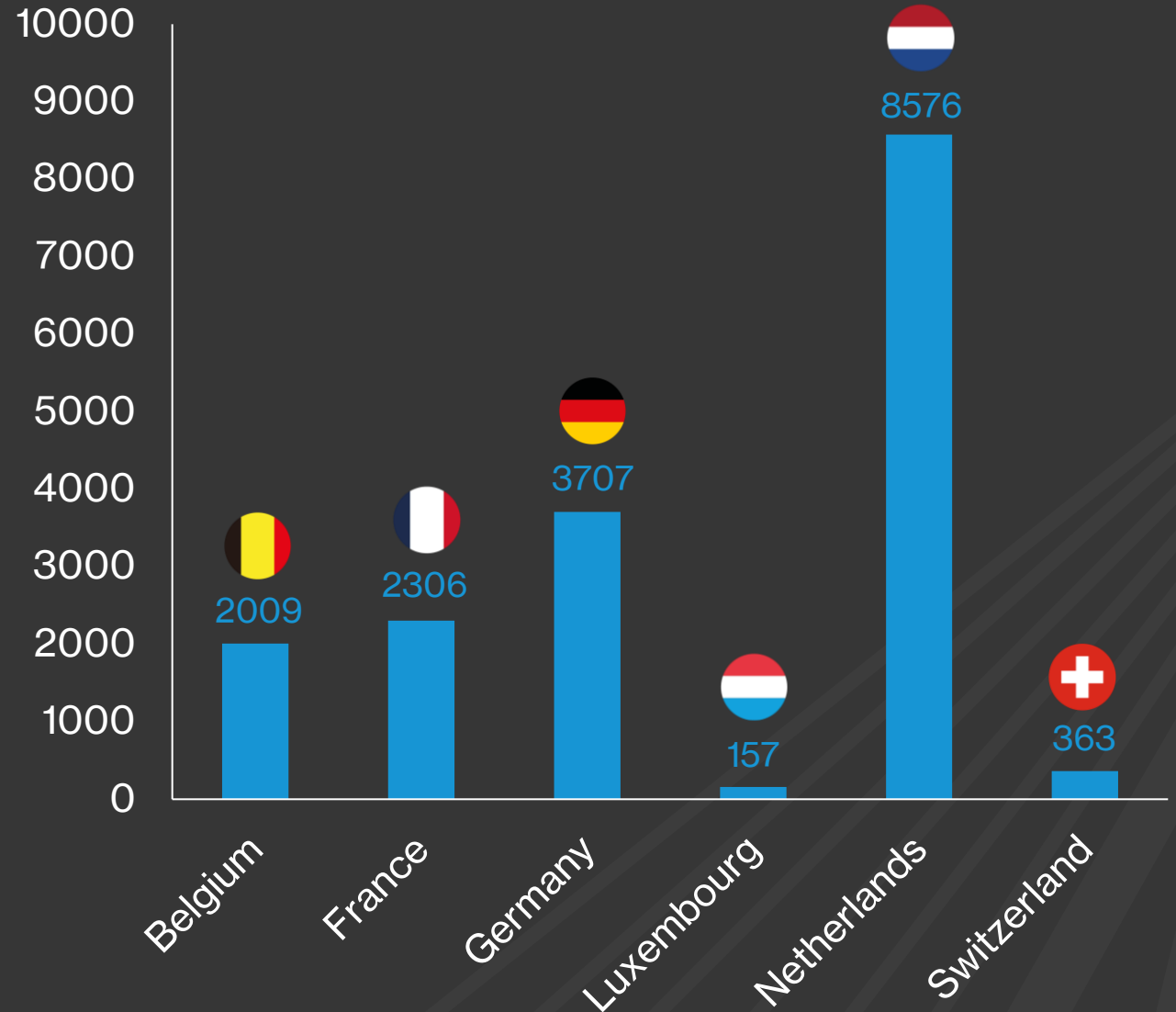
There is no antidote for phosphine toxicity. Initial treatment is ensuring that the patient is removed from the source of exposure. If this is done soon enough, it is well possible that there are no permanent negative health effects. If not, it can possibly lead to death. If exposed, always seek medical assistance.

IVR does not guarantee the accuracy or the content of this technical leaflet. For more information, contact the IVR website and the Dutch Ministry of Agriculture, Nature and Fisheries.

Fleet statistics Western Europe



Vessels per country:





HOOGTEPUNTEN

De nieuwe Schuttevaer is uit: 'Fosfine moet onder ADN' en 'Ons graan moet over water'

Er moet veel in de nieuwe Schuttevaer. Zo sleutelt een Europese werkgroep aan een oplossing voor fosfine, die moet het gi...



GEGASTE LADING

'Fosfine moet onder gevaargoed ADN'

Gegaste bulkclading moet worden ondergebracht in het Europese verdrag voor het vervoer van gevaarlijke stoffen in de binne...



LAVENDELZAKJES

Schipper Lenten na fosfine-incident: 'Iedereen moet een gasmeter'

De lading tarwe uit Oekraïne die de Leonore van Duisburg naar Nijkerk voer, was gegast met het levensgevaarlijke fosfine....



GEGASTE LADING

KBN waarschuwt voor fosfine in lading uit Oost-Europa na nieuw incident

Koninklijke Binnenvaart Nederland (KBN) waarschuwt binnenvaartschippers voor het laden van bulkclading uit treinwagons afk...



FOSFINE

Geldboetes voor Nederlandse bedrijven na fosfine-incident op drie binnenvaartschepen

Het Openbaar Ministerie heeft een geldboete van 12.500 euro opgelegd aan twee Nederlandse bedrijven die in 2021 ladingen ...

25 januari 2024



OPNIEUW GIF IN LADING

Twee schepen met fosfine stilgelegd bij Lobith

De ILT heeft donderdag twee schepen stilgelegd waarvan de lading is besmet met fosfine. Dat gebeurde na een melding over ...



AANSCHERPING

Levensgevaarlijke fosfine voor binnenvaart in de ban

Het gebruik van fosfine wordt verder aan banden gelegd. Naar aanleiding van een aantal levensbedreigende incidenten met h...



OPGELUCHT

Fosfine uit de schepen: Weslie en Daya varen weer

De binnenvaartschepen Weslie en Daya zijn onderweg met de, inmiddels ontgaste, lading maïs. De schepen lagen een week sti...



LADING MAÏS

Fosfine-alarm gaat weer af: giftige lading aan boord van twee binnenvaartschepen

Opnieuw zijn er te hoge waardes fosfinegas gemeten aan boord van binnenvaartschepen. De schepen Weslie en Daya laadden wo...



VERGIFTIGING

Havenwerkers op zeeschip onwel door fosfine

Opnieuw heeft zich een geval voorgedaan van vergiftiging door fosfine in de lading van een schip. Ruim 2,5 jaar geleden l...

20 mei 2022



The perfect gas

- Non-explosive
- Non-flammable
- Only toxic to insects
- Direct gas development
- Leaves no residue
- The gas spreads quickly and well through the entire cargo

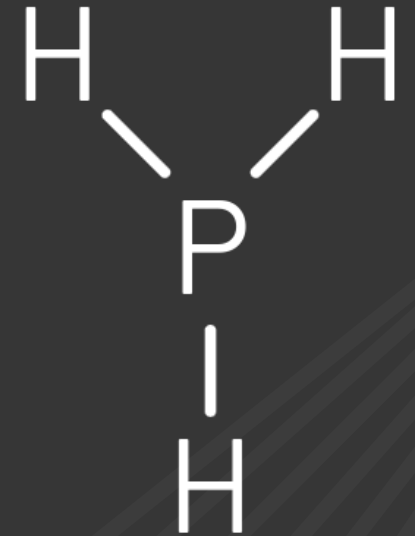
Phosphine gas

- Explosive
- Highly flammable
- Toxic to insects, but also to humans
- Gas development only under good conditions
- Leaves residues
- The gas spreads slowly through the cargo, bottom of the hold only with a recirculation system



What is Phosphine?

- Phosphine is a flammable gas with a distinctive odor often described as resembling rotten fish or garlic.
- Phosphine is a simple molecule composed of one phosphorus atom and three hydrogen atoms. It is a weak base and can react with acids to form phosphonium salts.
- Was first synthesized in the 19th century and has been used in various applications since then, including in the early days of chemical warfare.
- Phosphine is highly flammable and can form explosive mixtures with air. Proper ventilation and handling precautions are crucial when working with this gas.

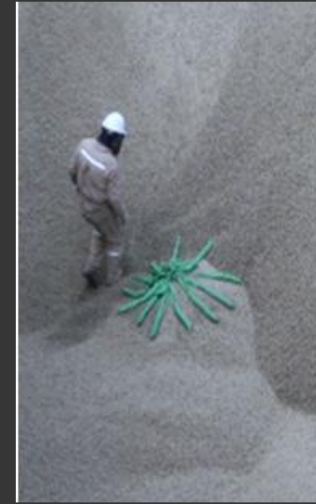


Phosphine



Why “In Transit Fumigation”

- Essential for world trade and cargo protection
- Preventing the spread of vermin (infestation)
- Contract requirements / value protection (insurance)
- Import and export requirements



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Why during voyage?

- No loss of time
- Financial interest



Use of Phosphine

- Loose phosphine tablets (3 gram product → 1 gram gas (AC))
- Sleeves



2 recent incidents in The Netherlands

- Fox (December 2019)
- Two people admitted to intensive care



- Coby, Imatra en Semper Spera (July 2021) by train
- No personal injury but financial damage



▶ What happens when you are exposed (inhalation)?



- **First signals:** eye irritation, dizziness, coughing, headache, nausea, vomiting, diarrhea.
- **Severe poisoning:** pain on the chest, palpitations, weakness of the heart (low blood pressure), drowsiness, convulsions, unconsciousness, Cell damage (lung, liver, kidney, heart damage). Even death in severe cases.
- Also **pay attention to pets:** they are often affected sooner than humans.



Effects and Treatments

Single (limited) exposure: full recovery (no long-term effects expected)

Severe exposure: Symptoms usually occur almost immediately (sometimes it takes longer) Depending on the amount of cell damage (hospitalization) possible permanent damage

Stack Poison: No indications for. Phosphine is broken down in the body (usually within a few hours)

After exposure, remove victim (safely) from source of exposure (fresh air).

Call emergency services 112 /999/911



Regulatory Framework

International

Recommendations on the Safe Use of Pesticides in Ships applicable to the Fumigation of Cargo Holds (IMO-regulations)

International Maritime Dangerous Goods (IMDG)

International Maritime Solid Bulk Cargoes Code (IMSBC)

Gafta Standard for Fumigation

National (The Netherlands)

Legislation on working conditions (Arbowet)
Plant protection products and biocidal products Act (Wgb)

Regional

Port Bye-Law Rotterdam (art. 4.7 C)

ADN, not to be expected before 2027



- Cargo covered by ADN can normally only be transported by vessels with an ADN certificate.
- That would mean that virtually all those currently transporting this cargo (e.g. grain) would no longer be able to do so.
- Goal of the European working group is to implement a mandatory measurement on board after the transfer, conducted by an expert rather than the skipper. This will incur additional costs, as a gas specialist must be present for every potentially hazardous cargo. It's still uncertain where these costs will ultimately fall, but they will not be the responsibility of the skipper.
- Following the incident with the "Fox", protocols for transshipment from seagoing vessels have been tightened significantly, with effect.



Guidelines and Plan of Action

Guideline
for gas measurements for cargo that has been fumigated with phosphine abroad
Version 1.0 -2024

SPIKE GROUP **EWSGROUP** **Anticimex**
Fumico **Ruvoma** **AMS Marine Service BV**

NON AUTHORITATIVE TRANSLATION
Warning: Notwithstanding great care has been taken in translating the Dutch exemption document, differences between the English and Dutch text may occur. In cases of disputes or discrepancies the Dutch text shall prevail.

Plan of Action for ships of which the cargo has been fumigated with phosphine in a foreign port

Forming part of the Regionale Havenverordening Noordzeekanaalgebied 2019 (Regional Port Bye-laws for the Noordzeekanaalgebied 2019)



► (Legal) Consequences

January 2024: fine 12.500 euro

Inland vessels were carrying wheat from Poland (train) to an animal feed company. Polish seller had wrongly failed to mention that phosphine had been used. According to Public Prosecution, the two Dutch companies in the transport chain did not deliberately act incorrectly, but they should have been more careful.

The skippers of the three vessels, De Coby, Imatra and Semper Spera were not aware of the presence of this gas. They would also have been exposed to it. The concentration was reported to be 140 ppm (parts per million), while it should only be 0.1 ppm. Above 0.5 ppm, the poison gas is dangerous to humans. Took more than one month to fully degas.

Insurance?



Business interruption insurance? Not likely and common



Preventive Measures

- Gas measurement by gasdoctor
- Gas detection
- Gas mask
- > 0.20 ppm respiratory protection mandatory!



ILT waarschuwt voor gasmaskers met asbesthoudende filterbussen

25/10/2023

De Inspectie Leefomgeving en Transport (ILT) vond onlangs per toeval tijdens een reguliere controle aan boord van een bulkcarrier gasmaskers met asbesthoudende filterbussen. De...



- It is advisable for skippers to avoid gaps or other openings between the cargo hold and engine rooms and/or accommodation. A cargo hold is not gas tight!
- The responsibility doesn't rest solely with the skippers. Cargo owners, transshipment terminals, charterers, and skippers all play a part in managing risks. It's crucial to always seek information regarding the status of the cargoes. Furthermore, the terminal, cargo owner/client, or charterer can request additional measurements to be conducted.



Special thanks to



Van Ameyde Marine 



▶ ANY QUESTIONS?

IVR 



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