

Recommendations for fire brigade response when at risk through fumigated containers

Short title: Fumigated containers
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Change history:

Version: 4 (March 2023)

Replaces Version: 3 (November 2018)

Initial Version: June 2007

Significant changes:

- Editorial changes

Note:

A spelling that is equally fair to all genders is desirable. However, since corresponding newer spellings generally lead to major restrictions in readability, this has been dispensed with. Thus, for the entire document, the masculine form includes all genders, unless explicitly stated otherwise.

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1. Purpose of the instruction sheet

In particular, imported goods made of natural raw materials (wood, rattan, cotton, food and luxury foodstuffs) as well as goods with wooden transport securing devices (boxes, pallets, dunnage) are often fumigated for pest control before transport. These fumigants do not always (fully) evaporate during transport, however, and therefore constitute a hazard during transport and unloading. According to the latest international studies in every third imported container traces of these fumigants can be detected. Special measures must therefore be taken when responding to incidents involving containers or transport units of this kind, especially if the container was already or has to be opened.

gfpa Department 10 has summarised the information in this instruction sheet to reflect the state of the art and processed it for use by fire brigades. Advice on scenarios involving chemical weapons

2. General:

2.1. Properties:

- The main fumigants used for containers and transport units are methyl bromide, phosphine and sulfuryl fluoride. Chloropicrin, hydrogen cyanide, formaldehyde, ammonia, ethylene bromide and ethyl formate are also used in international transport.
In addition to the fumigants also so-called VOC`s (Volatile Organic Compounds) evaporated from the transported goods may represent a potential health hazard.
- Methyl bromide:
 - Gaseous
 - Colourless and odourless
 - Heavier than air
 - Explosive range: 8.6 - 20 %
- Phosphine:
 - Gaseous (but often used for fumigation in tablet form as aluminium, magnesium or zinc phosphide, which react with moisture in the air and release phosphine)
 - Garlic-like / carbide odour but only in high concentrations - health risk!
 - Explosive range: > 1 %
- Sulfuryl fluoride:
 - Gaseous
 - Colourless and odourless

2.2. Reconnaissance features

Labelling of container with IMDG Code 9 “Fumigation” (sometimes also in combination with UN3359)

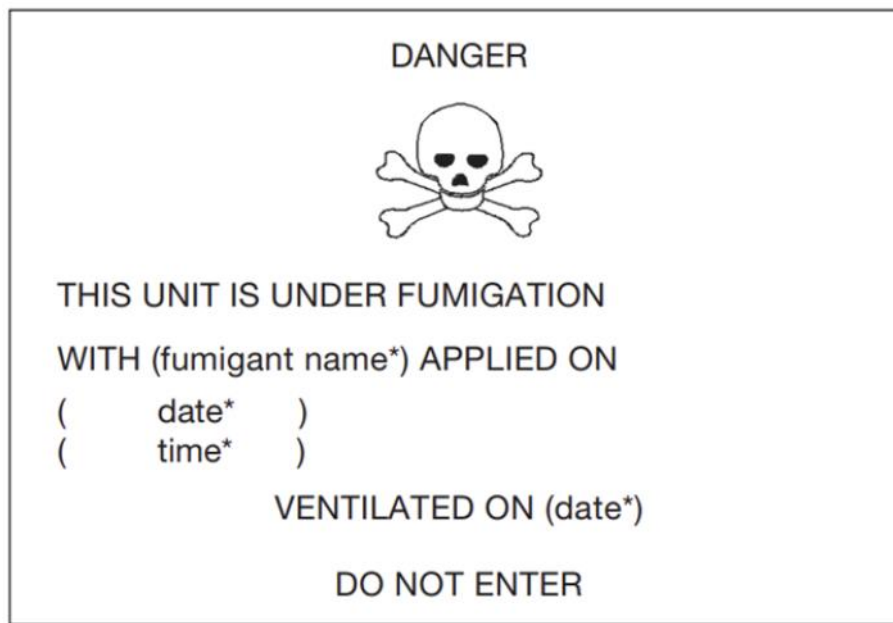


Figure 1: Labelling of container (IMDG Code 2020, Section 5.5.2)

- With containers not labelled: check transport documents (higher risk for contents like wood, furniture, rattan, textiles, and agricultural/forestry products etc. or wooden packaging, pallets, dunnage and products originating from Overseas/Asia)
- Taped ventilation slits on containers
- Destroyed “Fumigation” labelling
- Unconscious or injured persons when opening/unloading suspect containers of this kind
- Unpleasant, garlic-like smell (only with high concentrations of phosphine)

2.3. Detection

- Phosphine can only be smelled in high concentrations - health risk.
- Combustible gas detector, fumigant concentrations have been detected all the way up to the explosion range
- Detector tubes, for methyl bromide, phosphine and sulfuryl fluoride as well as Fumigation Simultaneous Set and additional detector tubes (see Draeger-Safety’s ‘fumigation measuring strategy’) for unknown risk situations
- Gas Detector Array (GDA)
- Photoionisation detector
- Ex measurement before further measurements

3. Measures

3.1. Safety Distance:

- Unprotected operational staff / persons must keep a safety distance of 10 m to suspect containers

3.2. Examination of suspect containers / loads

- Possible explosion risk of sealed, fumigated containers
- Isolate surrounding area
- Avoid sources of ignition

If there is a reasonable suspicion, the air inside should be analysed first through the closed door of the transport unit by using a suitable measuring device (e.g. an extension tubing/probe put through the rubber seal of the container door or other opening).

- In case of positive readings notify the responsible regulatory agency for occupational safety and consult a qualified expert (certified in accordance with No. 9.3, Para 13 of the Technical Regulation for Fumigation TRGS 512). If necessary, seal container again until technical assistance arrives.
- Only open and ventilate fumigated or suspect containers when wearing SCBA (self-contained breathing apparatus) Air-purifying respirators are effective for some fumigants only!
- With suspect transport units, make a visual inspection for fumigant residues of cargo such as substrates, bags or cans; if necessary, make a control measurement.
- Fumigant residues may continue to seep from packagings or linger in poorly ventilated areas at the rear of the container for a long time. This should be taken into account when unloading containers and handling the unloaded goods / packaging (ensure sufficient ventilation).
- Maintain an initial safety distance of 10 m around potentially fumigated cargos, which have been unloaded already.
- Please beware in addition to the fumigant risk that wooden crates, wooden pallets or dunnage can have severe “fungal infestation” to the extent that fungal spores may be released in quantities, which are dangerous to health. Inhalation should be avoided, especially while unloading (respiratory protection with at least P3 or FFP3 filters).

3.3. Follow-up measures:

- Ventilate suspect loads / cargos for a sufficient period of time (off-gassing can take several days)
- Handing over the site of operation to the operator
- Release of fumigated transport units only by competent persons or licence holders, no release by the fire brigade.

3.4. Notification:

- Consigner
- Consignee
- Competent occupational safety authority, if necessary
- Qualified and certified expert, if necessary

4. Literature

- DGUV 208-051 GEFAHREN BEIM ÖFFNEN UND ENTLADEN VON FRACHTCONTAINER, <https://publikationen.dguv.de/dguv/pdf/10002/208-051.pdf>
- INFORMATIONSSCHRIFT „GESUNDHEITSGEFÄHRDUNG BEIM ÖFFNEN BEGASTER CONTAINER“, STAND FEBRUAR 2009, BEZIRKSREGIERUNG DETMOLD, <https://www.bezreg-detmold.nrw.de/system/files/media/document/file/076begastecon.pdf>
- CIMOLINO (HRSG.): EINSATZLEITERHANDBUCH FEUERWEHR; ECOMED SICHERHEIT, LANDSBERG/LECH STAND 2022
- MESSUNG VON BEGASUNGSMITTELN IN CONTAINERN, MESSSTRATEGIE, HANDBUCH FÜR DRÄGER RÖHRCHEN UND MICROTUBES 21. AUFLAGE, DRÄGER SAFETY AG & Co. KGAA,
- TRANSPORT-INFORMATION-SYSTEM (TIS) DER TRANSPORTVERSICHERER IM GDV: HINWEISE ZUR BEHANDLUNG VON TRANSPORTHOLZ: <http://www.tis-gdv.de/tis/verpack/holz/export/export.htm>
- INFORMATIONEN DER BUNDESANSTALT FÜR ARBEITSSCHUTZ UND ARBEITSMEDIZIN BAUA ZUR TRGS 512 BEGASUNGEN: <https://www.baua.de/DE/Angebote/Rechtstexte-und-Technische-Regeln/Regelwerk/TRGS/TRGS-512.html>
- HANDBUCH „DON`T GET CAUGHT BY SURPRISE“ MIT HINWEISEN UND ERFAHRUNGEN ZUM SICHEREN ÖFFNEN UND UMGANG MIT BEGASTEN CONTAINERN VON TGAV IN ENGLISCHER SPRACHE