



Toxic fumigants in shipping containers

A company received a shipping container of nuts from South Africa. Workers for the company noticed fumigant packages on the floor of the container, threw them in the garbage, and continued unloading the nuts. The garbage was emptied and taken to a waste-sorting facility, where it came in contact with water. The leftover fumigant residue inside the packages reacted with the water, generating phosphine gas. As a result, 13 people were sent to hospital. The company was found guilty of improper waste disposal and fined \$65,000.

What are fumigants?

Fumigants are gaseous pesticides that completely fill a container to control pests (for example, insects, rodents, or fungi) inside. The following are the most commonly used fumigants:

- **Methyl bromide** – a colourless, odourless, flammable gas that is heavier than air. It is normally applied as a liquid under pressure, and is often mixed with tear gas to warn workers of its presence. Methyl bromide is available in cylinders and cans.
- **Phosphine** – a colourless, odourless, flammable gas that is released from aluminum or magnesium phosphide solids exposed to moist air. The products are available in pellets, tablets, sachets, fumi-cels, fumi-strips, and cylinders.
- **Sulfuryl fluoride** – a colourless, odourless gas that is applied under pressure. No indicator chemical is added, so the gas has no warning properties. It is available in cylinders.

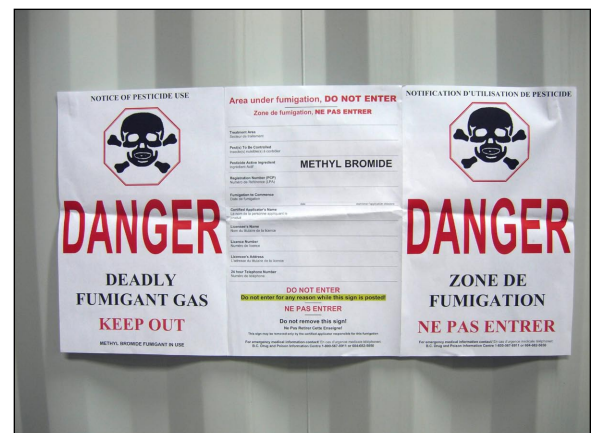
Approximately 20% of all shipping containers are fumigated. Upon completion of fumigation, containers are supposed to be ventilated to release the gas. However, residual fumigant gases (gases from solids) may still be present when a container is received.



Typical shipping container

What happens if I am exposed to fumigants?

- **Methyl bromide** is severely irritating to the lower respiratory tract, and can cause fluid buildup in the lungs (which may be delayed for hours after exposure). Early symptoms may include headache, dizziness, nausea, vomiting, tremor, slurred speech, and unsteady movements. Methyl bromide can also be absorbed through the skin.
- **Phosphine** is severely irritating to the respiratory tract. Symptoms of exposure include fatigue, nausea, headache, dizziness, thirst, coughing, shortness of breath, chest tightness, and jaundice.
- **Sulfuryl fluoride** can cause death through asphyxiation. Early exposure symptoms include nose, eye, and throat irritation; weakness; nausea; vomiting; difficult breathing; coughing; restlessness; muscle twitching; and seizures.



Fumigant gas warning label

Victims of fumigant exposure must be moved to fresh air immediately. Keep them quiet and in a semi-reclining position. If skin is contaminated, wash with soap and flush with water for at least 15 minutes. Seek medical attention immediately. Anyone attempting to rescue a person suffering from fumigant exposure should be properly equipped with a self-contained breathing apparatus.

How do I tell if fumigants have been used?

- Look for obvious signage with “Danger,” “Deadly,” “Fumigant,” or a skull and crossbones on the outside of the container. Look carefully, as signs may have been damaged or partially removed.
- Check the vents along the tops of the containers – they may have been taped closed or blocked to retain the gas.
- Look for suspicious cylinders, packets, pellets, or powder residues that may be present in the container.

How do I protect myself from exposure to fumigants?

- Conduct a hazard assessment before opening the container – look for evidence that fumigants may have been used. Air samples may be required to determine if hazardous levels of fumigant gas are present – these should only be collected by a qualified hazardous waste consultant.
- Don’t rely on odour to warn you of fumigant gas – cargo may emit an odour that may be confused with fumigants. Don’t enter the container if you notice any suspicious odours.
- Wear appropriate personal protective equipment as required, including protective clothing and a respirator.
- If additional ventilation is necessary, open the doors, remove any tape on the vents, and force air into the container using fans to displace the fumigant (which can collect in pockets in the cargo). Depending on the product that was treated, it may take several hours to a few days to displace the fumigant residues. Workers should be kept clear of the area while venting takes place.

How do I dispose of fumigants?

- You don’t – only specially trained people should be permitted to neutralize the remains of a fumigant or remove fumigant containers.
- Tablets or packets that generate phosphine gas may contain residues that are still active or could reactivate after the container has been ventilated. Residual phosphide solids can (and powder will) burn or explode on contact with moisture.
- Pesticide wastes are toxic and must be disposed of in accordance with local hazardous waste regulations.

For more information contact WorkSafeBC during normal business hours at 1 888 621-7233, or after hours at 1 866 922-4357.



Phosphine gas-generating packets and tablets



Methyl bromide gas cylinder



WORKING TO MAKE A DIFFERENCE
worksafebc.com