

# Cleaning up the container fumigation act

It is estimated that up to 5% of all shipping containers or their cargoes transported around the globe undergo some form of quarantine treatment or inspection in order to minimise the spread of pests and diseases from one country or continent to another. Bottlenecks and delays often occur as treatment and ventilation can take anything from 24 hours to a number of days to complete.

The most common cause of a quarantine treatment being required is the presence of timber products inside a shipping container. Treatments are performed to meet a convention known as the *International Standard for Phytosanitary Measures (ISPM 15): Guidelines for Regulating Wood Packaging Material in International Trade*. Wood packing, includes timber pallets, which are used in a very high proportion of container shipments, while treatment involves either heat treatment or, most commonly, fumigation with the quarantine gas methyl bromide.

## New technology is emerging which allows container fumigation to be carried out in an environmentally friendly way whilst at the same time improving container throughput\*

Though highly toxic, methyl bromide is a very effective biocide, and has been the fumigant of choice in many countries for more than 30 years. Unfortunately, it is also an extremely potent Ozone Depleting Substance (ODS) and has today been banned from use, except for quarantine and pre-shipment purposes, unless a special exemption is obtained under the Montreal Protocol. The latter has been ratified by 189 nations and has been very effective in virtually eliminating other ODSs such as CFCs as refrigerant gases.

Much research is being carried out to find substitutes for methyl bromide but it will most likely be many years before there is any widespread application of alterna-

tives in the quarantine arena. Any new gases, are also likely to be extremely toxic in order to perform their function.

In the interim, on opposite sides of the world, authorities are beginning to act and instigate mandatory recapture of methyl bromide. Belgium, for example, has regulated for this to occur from July 2007, while the Australian island state of Tasmania has had gas recapture systems in place since 2005.

### Residual gases

Moreover, many of the fumigants commonly used to treat cargoes inside shipping containers, including phosphine, hydrogen cyanide, and even chloropicrin (a nerve gas used infamously during World War

I) can leave dangerous levels of residual gases, even after a prescribed ventilation period.

Gases have also been known to arise inside containers due to desorption from cargoes, wood glues and other products. The "safe" level of exposure to any of these toxins has dropped considerably over the years, as detection monitors have progressively become more sophisticated, with levels below the "parts per million" causing concern.

A major concern is the fact that some of these gases, including methyl bromide, are odourless and not detectable without appropriate instruments at levels well in excess of safe standards. Regrettably there have been many in-



Authorities around the world are starting to make the recapture of fumigant gases mandatory. Tasmania has had gas recapture systems in place since 2005

stances of container inspection and unpacking staff being overcome by unknown gases inside the confined space of a shipping container. These are not always well documented, but anecdotally surprisingly common. An insidious dimension is the fact that many exposures may have delayed reaction times and a cumulative effect can occur even with repeated small exposures.

### Leading the way

The same technology that allows fumigant recapture is also being brought to bear upon the problem of residual gases within containers. Australia and the Netherlands are leaders in this cutting edge technology. Australian Customs will not enter a shipping container without first testing for a range of gases and using a fan-forced vacuum system to clear the container, rendering it safe for entry and unloading.

The southern Australian state of Victoria has brought in a safe work regulation, requiring 24 hour open-door ventilation of previously fumigated containers - even if fumigated overseas at port of origin.

In Australia, similar equipment is now increasingly being used by larger importing firms with a high rate of container import and hence repeated exposure risks for their unpacking staff. In many cases, the decision to implement improved practices has arisen only after an occurrence of gas exposure.

Europe has the most stringent safety standards and not surprisingly has a high incidence of identifying containers with unsafe levels of residual gases. The Port of Rotterdam, for example, has developed a special protocol for dealing with this problem and ventilates thousands of containers each year until safe levels have been reached. Other ports in Europe are believed to be studying the Dutch approach and this should lead to more widespread use of monitoring and ventilation equipment.

Gases found inside containers extend from fumigants to benzene and toluene - listed as carcinogens - and many more. The rate of unsafe gas levels being determined is remarkably high; industry sources put this in the range of 20% to 30% of all imported containers and sometimes even higher.

This scale of occurrence has been confirmed in studies performed in different parts of the world.

In North America, customs authorities are trialling residual gas removal technologies, following adverse experiences during the inspection of containers previously fumigated with methyl bromide. In the USA, there is a history of concern, particularly because of the huge volume of container imports which are shipped across the Pacific each year, many of them fumigated according to USDA requirements.

### Action plan

What actions can those concerned about this problem take? Recommendations vary depending upon local circumstances, but at the simplest level include checking to see if a container has been fumigated. Accompanying documentation should show this and a sticker should be evident on the container doors, as per IMO regulations, although in some gassing incidents these stickers had fallen off, or may never have been applied.

Gas monitors are available, with varying levels of sophistication, and can indicate whether a container is safe to enter.

Ventilation alternatives vary from simply leaving doors open for an extended time, placing a fan at the entrance or - the most effective and time-efficient solution - using purpose built clip-on technology to recapture the gas. The cost of such equipment is becoming more economical as adoption spreads.

Lastly, reporting of incidents when they have occurred allows authorities responsible for safe transportation of containers to be kept informed. There are many more instances of people being affected by residual gases inside shipping containers than are reported each year and, to a large extent, addressing this problem requires acknowledgement of the scale of the problem in the first place.

In the meantime, it pays to be cautious when entering any shipping container. It is very much a case of what you can't see, can hurt you! □

*\*This article was written by Wil Grullemans, general manager of Sydney-based Nordiko Quarantine Systems Pty Ltd*