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| <b>Title</b>          | IMDG Code 2016 / SUPPLEMENT / Recommendations on the Safe Use of Pesticides in Ships applicable to the Fumigation of Cargo Transport Units / 7 |
| <b>Effective Date</b> | 1-1-2012                                                                                                                                       |
| <b>Invalid from</b>   | 1-1-2014                                                                                                                                       |
| <b>Note</b>           | Incorporating Amendment 35-10                                                                                                                  |

## 7 Fumigation detection

### 7.1

The most effective method of protection is to carry out gas tests when the container doors are opened. As a minimum, it is recommended to test for Phosphine and Methyl bromide as the two most common fumigants used. If gas is found the container should be put aside for ventilation.

#### 7.1.1

##### Stain tube gas test equipment

##### 7.1.1.1

Glass stain tube equipment is simple in design and use, robust and reliable. A test for Phosphine and Methyl bromide can be carried out by a person standing outside the container using a lance inserted into the container doorway. In practice air is drawn by small hand-held bellows through a glass tube containing impregnated crystals which react with the gas for which the test is being done. If the air is contaminated by the gas in question, the crystals change colour. The function is not affected by moisture, but care has to be taken to warm the tubes to above 0°C in sub zero temperatures. Also a reasonable degree of light is required to detect the colour change of the crystals. The tubes should be used in accordance with the manufacturer's instructions. In particular, they must not be used after their expiry date.

#### 7.1.2

##### Electronic (photo-ionisation gas testing equipment)

##### 7.1.2.1

Gas tests can be carried out that detect the presence of gases and their concentration levels. Similarly, equipment can confirm that there is a safe level of oxygen within the container. At the present time the technology is such that both the quantification and discrimination are poor. There are frequent false positives due to cross sensitivities and readings are not accurate enough for determining safe exposure levels. Therefore the use of these instruments at the present time is not recommended.

### 7.2

#### Personal monitors

#### 7.2.1

Small electronic personal monitors are available for Phosphine, but not for Methyl Bromide. Phosphine monitors can be placed inside the container while unloaders are working, or worn by individuals on outer garments. The location of an independent monitor is important both to ensure that any fumigant is detected and ensure that the reading is not compromised by ventilation at the door or external contaminants. Monitors issue an audible signal if Phosphine levels reach the pre-set level and are useful as warning devices. However, they should not be used for the initial fumigation detection and measurement process. Also, electronic monitors have the disadvantage that they can respond to a range of harmless substances giving misleading alarm signals.

#### 7.2.2

Personal monitors are also available to show the level of oxygen within the container. This would indicate a deoxygenated atmosphere but would not necessarily indicate that the atmosphere is free from fumigant.