

## Dräger Fumigation Test Set

The Dräger-Tube® measurement system provides an easy method for testing containers and other spaces for the presence of fumigation agents. A specially developed measuring strategy allows for the detection of fumigants even when the chemical is unknown. The Dräger Fumigation Test Set can be equipped with all of the necessary components for this measurement.



ST-4324-2003

### Hazards caused by fumigants

To prevent goods from being damaged by animals such as insects and other disease carriers, containers are flooded with toxic or suffocating gases.

Fumigants are highly toxic and harmful to the health in many ways. To ensure adequate protection, the concentration of the fumigants used must be measured. This is relevant for all personnel present during:

- the start or finish of the fumigation process
- the opening of transport containers or other confined spaces
- the loading or unloading of fumigated products from transport containers
- the removal of fumigated goods from packaging materials
- transportation (in case of leakages)

Suitable measurement instruments are used to determine the type and concentration of fumigants before opening a container or entering other spaces.

Thereby, it is important to check the Oxygen concentration in the container or other spaces. When inert gases have been used, they will displace Oxygen and this results in a very high probability of suffocation. A leakage in one individual package is one example of a relatively simple cause for this.

### Mobile and quick

The well-known Dräger-Tube measuring method is an easy way to perform measurements. In only a few minutes, the concentration of the fumigants within the container can be determined. Depending on the concentration measured, the decision can be made whether the container or space can be entered or ventilated.

Even when a container has not been declared correctly or the labeling is no longer legible, the Dräger measuring strategy will assist in the identification and detection of the fumigation agents.



ST-6756-2003

### Dräger Fumigation Test Set

The quick and easy way to determine whether a container has been fumigated.

### Easy to use

For several decades, Dräger-Tubes have been renowned for their ease of use and high degree of measurement accuracy. Even without special training, the Dräger-Tubes, which were especially developed for this application, provide reliable test results. Dräger-Tubes are ready for use at any time. All that is needed are the corresponding tubes, the Dräger accuro® hand pump, and the Dräger bar probe. By comparing the color change within the detector tube to the printed scale, an estimation of the concentration can be made.

### Recommended measurement strategy

If the fumigant is known, the corresponding Dräger-Tube is chosen and the measurement carried out as instructed. If the measurement result is too high, then the container or space should be ventilated. A new measurement should be taken at periodic intervals and, when the concentration is low enough, the container or room can be released for entry. If the concentration detected is below the defined maximum limit, the container or room can be opened and entered.

The measurement of fumigants should take place while the container is still closed. To do this, insert the Dräger Bar Probe (order code 83 17 188) e.g. through the rubber seal of the container door. The probe should be used to lift the rubber seal of the container at its lowest point and pushed as far as possible into the container. The Dräger-Tubes should then be prepared for measurement and attached to the bar probe. The necessary pump strokes for the measurement should then be made by using the Dräger gas detection pump.

If the fumigant is not known, the use of the Dräger Simultest Fumigation is recommended to determine which chemical has been used. This test set allows for the measurement of five typical fumigation agents at the same time:

- Ammonia or Ethylene Oxide
- Methyl Bromide
- Hydrocyanic Acid
- Phosphine
- Formaldehyde

In addition, the following Dräger-Tubes should be used for the measurement of

Ethylene Oxide, Carbon Dioxide, and Sulfuryl Fluoride:

- Ethylene Oxide 1/a  
Measuring range from 1 to 15 ppm
- Carbon Dioxide 0,1 %/a  
Measuring range from 0.1 to 1.2 Vol.-%
- Sulfuryl Fluoride 1/a  
Measuring range from 1 to 5 ppm

When one or more gases are present, the container or space should be ventilated with air before entry and individual Dräger-Tubes used to test the concentrations of the corresponding gases periodically.

If personnel should be equipped with personal air monitors for the measurement of Oxygen, Dräger offers a complete line of measurement and warning devices equipped with electrochemical sensors for this purpose.

To determine a potential risk of explosion, Dräger measurement and warning devices equipped with an infrared Ex-sensor should be used. Gas detectors that use catalytic ex-sensors are not appropriate as they do not operate in inert atmospheres.



Direct container measurement



Dräger Simultest Fumigation

## ORDER INFORMATION

Description	Order Code
Fumigation case (empty)	83 17 147
Gas detector pump – Dräger accuro®	64 00 000
Bar Probe 400 for the measurement of fumigants in containers <sup>1)</sup>	83 17 188
Extension hose for Dräger accuro, 1 M; 3.3 ft.	64 00 561
Adapter Dräger Simultest, consisting of cutting holder and adapter	64 00 090
Spare parts set for Dräger accuro	64 00 220

<sup>1)</sup> In order to use the Bar Probe 400 with the Simultest Set, two additional adaptors are necessary.

Dräger-Tube	Measuring Range	Order Code
Ammonia 5/a	5 – 700 ppm	CH 20 501
Benzene 0.5/c	0.5 – 10 ppm	81 01 841
Carbon Dioxide 0.1%/a	0.1 – 6 Vol.-%	CH 23 501
Carbon Monoxide 10/d	10 – 3000 ppm	81 03 321
Chloropicrine 0.1/a	0.1 – 2 ppm	81 03 421
1,2-Dichlorethane (using Dräger-Tube Methyl Bromide 0.2/a)	2 – 10 ppm	81 03 391
1,3-Dichloropropene 0.1/a	0.1 – 10 ppm	81 03 551
Ethylene Oxide 1/a	1 – 15 ppm	67 28 961
Ethyl Formate 20/a	20 – 500 ppm	81 03 541
Formaldehyde 0.2/a	0.2 – 5 ppm	67 33 081
Hydrocyanic Acid 2/a	2 – 30 ppm	CH 25 701
Methyl Bromide 0.2/a	0.2 – 8 ppm	81 03 391
MITC 0.1/a (for the measurement of Methyl Isothiocyanate)	0.1 – 6 ppm	81 03 485
Oxygen 5%/C	5 – 23 Vol.-%	81 03 261
Phosphine 0.01/a	0.01 – 1 ppm	81 01 611
Phosphine 0.1/a	0.1 – 4 ppm	CH 31 101
Sulfuryl Fluoride 1/a	1 – 5 ppm	81 03 471
Toluene 5/b	5 – 300 ppm	81 01 661

Dräger Simultest Fumigation	Scale Mark	Order Code
Measurement of		81 03 410
Formaldehyde	1 ppm	
Phosphine	0.1 ppm	
Hydrocyanic Acid	10 ppm	
Methyl Bromide	0.5 ppm	
Ammonia	50 ppm	

Dräger Simultest Container Fumigation	Scale Mark	Order Code
Measurement of		81 03 380
Formaldehyde	1 ppm	
Phosphine	0.3 ppm	
Hydrocyanic Acid	10 ppm	
Methyl Bromide	0.5 ppm	
Ethylene Oxide	1 ppm	

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