



GASTEC



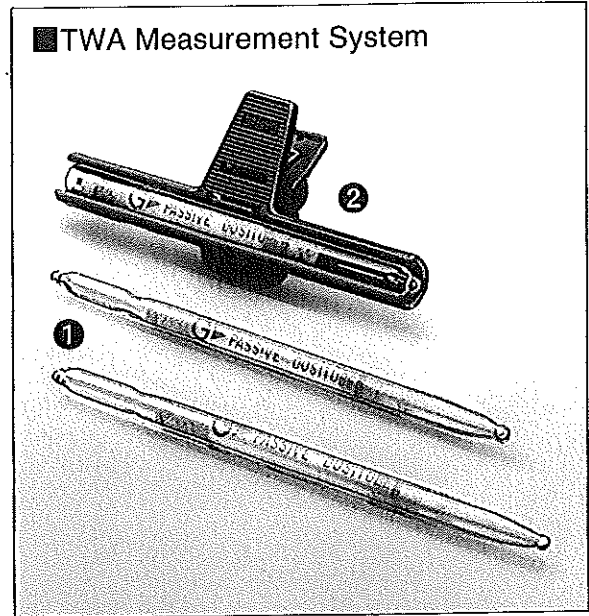
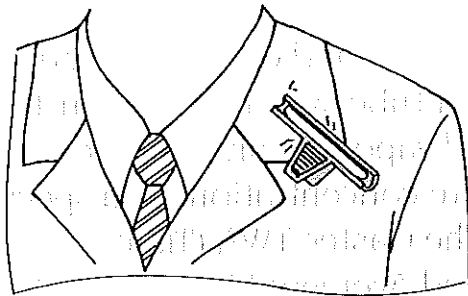
Chapter 4

Gastec Applied Detector Tube Systems for Long-Term Gas and Vapour Analysis

While the Gastec Standard Detector Tube system and Gastec applied detector tube systems for short-term gas and vapour analysis are to measure concentrations at a specific time, the Gastec TWA (Time-weighted Average) Measurement System determines the average concentration for a specific period of time. This system can measure concentrations to which people are constantly exposed in their workplaces.

TWA Measurement System

The TWA Measurement System consists of Gastec Dosi-tubes and the No.710 Tube Holder. Dosi-tubes are special detector tubes for measuring time-weighted average gas concentrations (TWA values). They can be attached with the No.710 Tube Holder to the breathing zone of people in a workplace for a prolonged time (1 to 10 hours) to measure personal exposure values. With this system day-to-day gas concentration fluctuation or gas concentration distribution in the workplace can be easily obtained. Measurement values can be used to assess the working environment by comparing them with the threshold limit values (TLV-TWA) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH).



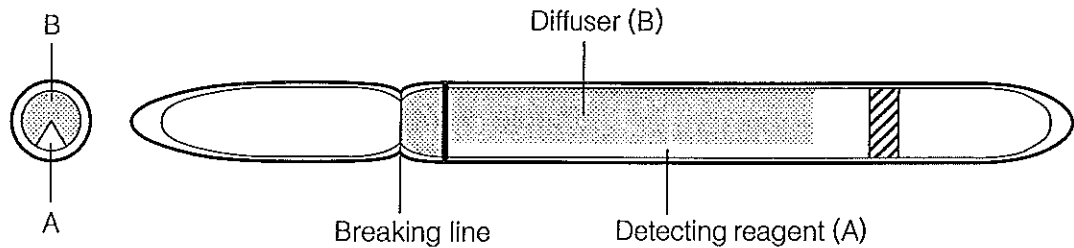
● Features

- Small and lightweight
- Simple direct measurements without special analysis equipment or complicated operation procedures

■ TWA Measurement System configuration

Components	Quantity	Remarks
Dosi-tubes (Photo ①)	1 box	10 tubes/box
No.710 Tube Holder (Photo ②)	1	

■ Structure of Dosi-tube (Example : Ammonia No.3D)

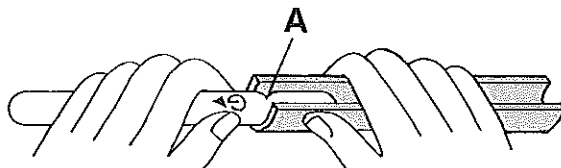


Most Dosi-tubes contain a diffuser and a reagent in parallel. The diffuser has many fine pores through

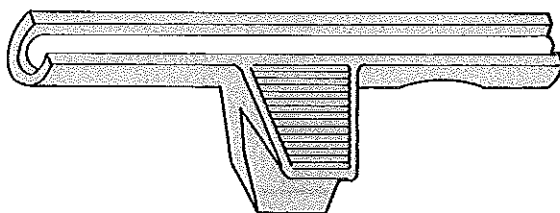
which the gas is diffused at a constant rate and reacts with the reagent to change its colour clearly.

■ Measurement procedure

- ① Write down the starting time of measurement on an adhesive label included inside each box of Dosi-tubes, and place the label onto the tube.
- ② Insert the G marked end of the Dosi-tube into the No.710 Tube Holder, and break the tube end at the breaking line (A). Remove the broken end from the Tube Holder.



- ③ Insert the Dosi-tube fully into the Tube Holder.



- ④ Attach the Tube Holder with the Dosi-tube to the shirt collar for personal sampling, or put it on an appropriate measurement point in the workplace for area monitoring.
- ⑤ When the measurement is finished, write down the finishing time on the label, and determine the actual sampling time :

$$= (\text{finishing time}) - (\text{starting time})$$
- ⑥ Obtain the average concentration (TWA value) by the following formula.

$$\text{TWA value (ppm)} = \frac{\text{Dosi-tube reading (ppm} \cdot \text{hr)}}{\text{Actual sampling time (hr)}}$$

■ Dosi-tube specifications

There are Dosi-tubes whose specifications are given in the following pages. Explanations of the specification items are the same as those for the Gastec standard detector tubes (see page 2-2).