Detector Tube System

Gastec Detector Tubes indicate concentrations directly by way of a calibrated scale printed on the tubes. Al Gastec, we endeavour to achieve highest quality detector tubes for analysing airborne gases/liquids, as well as pollutants in soil and water through our advanced state-of-the-art research and development. Through our efforts, we have acquired a solid reputation among our customers in virtually all sectors of industry, commerce and society. Tubes are now available for more than 500 different applications.

### One

Break off the both ends of the detector tube by using the built-in diamond tip breaker. Confirm the pump handle is fully pushed in, then insert the detector tube into the rubber inlet with O mark towards the gas sampling pump.

### Two

Align the guide marks on the pump shaft (≤ 100 or 50 ml), and pull out the handle until it is locked. Wait until the sampling time has elapsed. With an easy-to-see flow finish indicator (white disk pops out when the prescribed volume has been fully drawn), the operator is assured that the sampling is complete.

### Three

The colour in the detector tube changes as the gas is drawn in. Wait the required sampling time and read the measurement at the end of the coloured layer. (Be sure note the concentration or mark the colour change demarcation on the glass tube with a pen immediately.)
Sampling Pump [for short-term measurements]

The built-in tip breaker incorporates a diamond edge for maximum durability that cuts the surface of the detector tube. This makes the tip breaking much easier, safer, and convenient. Discarded tips are deposited in a storage bin for safe and easy disposal.

The pump piston has been designed with a smaller diameter so that the handle can be pulled out with even less effort. This permits anyone to operate the pump easily. Also, the pump coil has been designed to work in the leakage test of EN 137. Workplace atmosphere short-term detector tube measurement systems, requirements and test methods, D.2.2 Detector tube pump, D.2.2 Leakage. The detector tube pump with the closed detector tube connection shall be light, so that during the first minute of a pump stroke the leakage rate does not exceed 3 ml/min. The Gastec pump shaft shows you the leakage rates with red line.

The pump body is covered with a soft elastomer, with the middle portion narrower than the ends to ensure a firm grip on the pump cylinder. The other outer surfaces of the pump are made of non-sparking material (ABS resin except for the opening of the tube-tip cutter that is made of chrome stainless steel).

The full-stroke (100ml) and the half-stroke (50ml) positions are marked exactly by the red line on the pump dial, and the handle is precisely locked at those positions. The attached flow finish indicator tells you automatically when the stroke is complete. When the white disk pops out, the sample is complete.

The automatic stroke counter built in the model GV-110 gas sampling pump can track up to ten pump strokes automatically so there is no chance of miscounting.

Detector Tube [for short-term measurements]

- High quality glass tube
- Calibration scale (in ppm, mg/m³, mg/l, or % depending on the substance to be measured and its concentration)
- Printed in an ink that permits high legibility against the colour change layer. The scale is determined for each production lot that has passed Gastec’s existing qualification tests.
- Distinct layer of colour change.
- Reliable detecting reagents that comply with the Gastec’s stringent quality standards (regulating the length of colour change layer, the cleanness of demarcation, and the tone and brightness of colour change).
- Chemical formula of the substance to be measured. An abbreviation is used for a long formula.
- Standard number of pump strokes (n). The number of pump strokes required to collect the standard volume of sample air for this tube.
- Detector tube number. The number represents the kind of substance the tube can measure, and the letter specifies the level of concentrations the tube can determine. For example, H, M and L respectively indicate high, middle, and low levels concentrations.
- Quality control number (QC No.). Gastec’s quality assurance number is printed on every Gastec detector tube. Detector tubes of the same production lot have the same QC No. When a QC No. is registered, sample tubes with that QC No. will be kept and monitored periodically to verify the quality.
Measurement procedure with GASTEC Detector Tube System

The primary step is providing countermeasures against hazardous gas generation for occupational hygiene control. Pollution control to acquire accurate data regarding gas types and their concentration levels. Our GASTEC Detection Kit includes 12 detection tubes.

1. Confirm the direction of air flow at the measurement site by using the No.500 Smoke Tester Set.
2. Connect the No.350A Extension Hose to the Model GSV10C Gas Sampling Pump, when necessary.
3. Break off both ends of a Polytube No.107 and connect the tube to the pump, or to the end of the Extension hose when it is used.
4. Pull-out the handle of the Pump, wait for the predetermined sampling time and examine the tube for color change.
5. Proceed with the measurements by using all 12 kinds of detector tubes as shown in the following toxic gas determination flowchart.
6. Finally, determine the pollutants from the measurement results.

**Toxic Gas Detection System (Gastec TG-1 System)**
- Provides immediate identification of unknown gases on the spot by just following the flowchart.
- No batteries or electrical power required.
- Requires fewer pump strokes and provides faster results.
- GASTEC sampling pumps and detector tubes are pre-calibrated and are always ready to use.

**Toxic gas detection flowchart**

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**Example: No.107**

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Substance    Concentration (ppm)    Changes from white to
Carbon disulfide ≤ 1 ppm    Green
Hydrogen sulfide ≤ 1 ppm    Green
Carbon monoxide ≤ 10 ppm    Green or Brown
Acetone 1000 ppm    Brown
Acrylonitrile ≤ 10 ppm    Brown
Ethylene ≤ 60 ppm    Yellow or Brown
Propene 100 ppm    Yellow
Propylene 100 ppm    Yellow
Butane 10 ppm    Yellow
Isobutane 10 ppm    Yellow
Isopropylene 10 ppm    Yellow
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Qualitative Analysis System for Unknown Gases

The GASTEC Polytec System consists of the Model GSV100 or GSV110 Gas Sampling Pump and the Polytec Tubes. The Polytec tubes are unique detector tubes, each having 1 to 7 reaction layers to determine multiple unknown substances in the sample simultaneously. When you pull the handle of the pump, the amount of gas is sample, the color(s) of the Polytec tube's indicator changes uniquely according to the contents of the sample. Four types of Polytec Tubes are available: Polytec I (No. 107), Polytec II (No. 25), Polytec III (No. 24), and Polytec IV (No. 27). Detailed description and color changes of the tubes are mentioned in the instruction sheets included with individual Polytec Tubes.
Other Detector Tubes

Passive Dosimeter-Tube (for long-term measurements)

The TWA measurement system consists of Gastec Dose-Tubes and the No. 710 Holder, Direct reading Passive Dosimeter-Tubes are specially designed tubes for measuring time-weighted average gas concentrations (TWA values). They can be attached to a pocket or collar using the No. 710 Holder to measure the breathing zone of people in a workplace for a prolonged period of time (15 to 180 hours) to determine personal exposure values. With this system day-by-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).

Aitec Tube for analysis of Breathing Air/airline test

Aitec tubes are a convenient and simple system for testing gas cylinders, compressed breathing air and air lines. Industrial operations often produce, or are performed in the presence of harmful airborne contaminants. When self-contained breathing apparatus or other devices are used for respiratory protection, the quality of the breathing air requires special attention. Contaminants entering the compressor or contaminates generated by the compressor or cylinder can be harmful to the worker and the respiratory equipment.

Tubes for Substance in Solution

Dissolved substances in solution can be measured by simply immersing a Gastec Dissolved Substance Detection Tube (with both ends broken) into a solution, with directional armor. By inserting the tube, the solution will rise up through the tube due to capillary action and react with the reagent in the tube. Tubes are available for measuring Hydrogen (H2), Chlorine (Cl2), Acetylene (C2H2), Oxygen (O2), Arsenic (As), Sulfur (S), and many others. The sample is drawn into the tube by capillary action.

* Adjustment of pH is required when measuring with liquid detector tubes.