

# GASTEC Instructions for No.121 Benzene Detector Tube

## FOR SAFE OPERATION :

Read this manual and the instruction manual of your Gastec Gas Sampling Pump carefully.

### ⚠ WARNING:

1. Use only Gastec detector tubes in a Gastec pump.
2. Do not interchange or use non-Gastec parts or components in Gastec's detector tube and pump system.
3. The use of non-Gastec parts or components in Gastec's detector tube and pump system or use of a non-Gastec detector tube with a Gastec pump or use of a Gastec detector tube with a non-Gastec pump may result in property damage, serious bodily injury, and death; voids all warranties; and voids all performance and data accuracy guaranties.

### ⚠ CAUTION: If not observed, injuries to the operator or damage to the product may result.

1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, piece and reagent with bare hand(s).
3. The sampling time represents the time necessary to draw the air sample through the tube. The tube must be positioned in the desired sampling area for the entire sampling time or until the flow finish indicator indicates the end of the sample.

### △ NOTES : For maintaining performance and reliability to the test results.

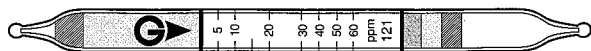
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube under the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube under the relative humidity range of 0 - 90%.
4. This tube may be interfered with by the coexisting gases. Please refer to the "INTERFERENCES".
5. Shelf life and storage condition of the tube is marked on the label of the box of tube.

## APPLICATION OF THE TUBE :

Use this tube for the detection of Benzene in air or the industrial areas and environmental atmospheric condition.

## SPECIFICATION :

(As a result of Gastec's commitment to continued improvement, specifications are subject to change without notice.)



Measuring Range	2.5 - 5 ppm	5 - 60 ppm	60 - 120 ppm
Number of Pump Strokes	4	2	1
Correction Factor	1/2	1	2
Sampling Time	1.5 minutes per pump stroke		
Detecting Limit	0.5 ppm (n = 4)		
Color Change	White → Dark green		
Reaction Principle	Benzene reduces iodine pentoxide to liberate iodine, which produces a dark green in color. $\text{C}_6\text{H}_6 + \text{I}_2\text{O}_5 + \text{H}_2\text{S}_2\text{O}_7 \rightarrow \text{I}_2$		

**Coefficient of Variation : 10% (for 5 to 20 ppm), 5% (for 20 to 60 ppm)**

**\*\* Shelf Life : Please refer to the Validity Date printed on the box of tube.**

**\*\* Store the tubes in the cool and dark place.**

## CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE

Calibration of the Gastec detector Tube No.121 is based on a tube temperature of 20°C (68°F) and

not the temperature of the gas being sampled, approximately 50% relative humidity and normal atmospheric pressure.

**Temperature :** No correction is required.

**Humidity :** No correction is required.

**Pressure :** To correct for pressure, multiply the tube reading by

$$\frac{\text{Tube Reading (ppm)} \times 1013 \text{ (hPa)}}{\text{Atmospheric Pressure (hPa)}}$$

## MEASUREMENT PROCEDURE :

1. For leak tight check of the pump insert a fresh sealed detector tube into pump. Follow instructions provided with the pump operation manual.
2. Break tips off a fresh detector tube in the tube tip breaker of the pump.
3. Connect both tubes with rubber tubing supplied in the box of the pump.
4. Insert the detector tube securely into pump inlet with arrow (G) on the tube pointing toward pump.
5. Make certain pump handle is all the way in. Align guide marks on pump body and handle.
6. Pull handle all the way out until it locks on 1 pump stroke (100ml). Wait 1.5 minutes and confirm the completion of sampling. Repeat the above sampling procedure one more time.
7. For lower than 5 ppm measurement, repeat the above sampling procedure 2 more times until the stain attains to the first calibration mark. For higher than 60 ppm measurement, prepare fresh tube and take 1 pump stroke.
8. Read concentration at the interface of the stained-to-unstained reagent.
9. If correction is needed, multiply the correction factors of pump strokes and pressure.

## INTERFERENCES :

Substance	Concentration	Interference	Changes color by itself to
Esters	≥ 2000 ppm	Plus error	No discoloration
Aromatic HCs		Plus error	Dark green

Aromatic hydrocarbons other than benzene are trapped in the brown layer in the pretreatment tube. If the pretreatment reagent is entirely consumed (whole brown layer turns to dark brown), a higher reading will be given.

The table of this interference gases primarily expresses the interference of each coexisting gas in the gas concentration range, equivalent to the gas concentration. Therefore, the test result may be given positive result by the other substances not listed in the table. For more information is needed, please contact us or our distributors in your territory.

## APPLICATION FOR OTHER SUBSTANCES :

Substance	Correction Factor	No. of Pump Strokes	Measuring Range
Diisobutylene	9	1	45 - 540 ppm
α-Pinene	19	3	95 - 1,140 ppm

## CORRECTION FACTOR :

Detector tubes are primary designed to measure specific gases. But it is also possible to measure other substances of similar chemical properties with the aid of a correction factor or chart. Therefore, please make use of the correction factor/chart measuring ranges as a reference. For more precise factor please contact your Gastec distributor.

## DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (2004) : 0.5 ppm  
Threshold Limit Value-Short Term Exposure Limit by ACGIH (2004) : 2.5 ppm  
Explosive Range : 1.3 - 7.1%

## DISPOSAL INSTRUCTION :

Reagent of the tube uses toxic chromic acid. When disposing the tube regardless of used or unused, follow the rules and regulations of the local government.

## WARRANTY :

If you have any questions regarding gas detection and quality of the tubes, please feel free to contact your Gastec representatives.

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