

# GASTEC No.13

## Instructions for Carbon Disulfide 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, pieces and reagent with bare hand(s).

#### ⚠ NOTES : For maintaining performance and reliability of the test results.

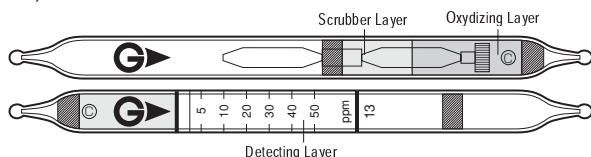
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may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

### APPLICATION OF THE TUBE :

Use this tube for the detection of Carbon Disulfide 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	0.63 - 1.25 ppm	1.25 - 2.5 ppm	2.5 - 50 ppm	50 - 100 ppm
Number of Pump Strokes	4	2	1	1/2
Correction Factor	1/4	1/2	1	2
Sampling Time	3 minutes per pump stroke			1.5 minutes
Detecting Limit	0.3 ppm (n = 4)			
Color Change	Blue → Yellow			
Reaction Principle	Carbon disulfide is oxidized by nascent oxygen, which is generated by the reaction of chromic acid and sulfuric acid to sulfur dioxide. Sulfur dioxide neutralizes barium chloride, discoloring pH indicator to yellow. $\text{CS}_2 + \text{CrO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{SO}_2 + \text{CO}_2$ $\text{SO}_2 + \text{BaCl}_2 + \text{H}_2\text{O} \rightarrow \text{BaSO}_3 + 2\text{HCl}$ $\text{HCl} + \text{Base} \rightarrow \text{Chlorides}$			

**Coefficient of Variation : 10% (for 2.5 to 10 ppm ), 5% ( for 10 to 50 ppm)**

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

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

### CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Calibration of the Gastec detector Tube No.13 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 :** Correct for temperature by the table below.

Temperature (°C) (°F)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Correction Factor	1.25	1.1	1.0	0.95	0.82

**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 checking 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 primary tube and secondary tube by bending each tube end in the tube tip breaker of the pump.
3. Connect © marked ends with rubber tubing after breaking each end.
4. Insert secondary 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 3 minutes and confirm the completion of the sampling out.
7. For lower than 2.5 ppm measurement, repeat the above sampling procedure 1 or 3 more times until the stain attains to the first calibration mark. For higher than 50 ppm measurement, prepare fresh tube and take 1/2 pump stroke.
8. Read concentration at the interface of the stained-to-unstained reagent.
9. If correction is needed, multiply the correction factors of temperature, pump strokes pressure.

### INTERFERENCES :

Substance	Concentration	Interference	Changes color by itself to
Ammonia		No effect	No discoloration
Hydrogen cyanide	≥ 200 ppm	No effect	No discoloration
Sulfur dioxide	≥ 1/5	Plus error	Yellow

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.

### DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (2004) : 10 ppm

Explosive Range : 1.3 - 50 %

### DISPOSAL INSTRUCTION :

Reagent of the tube contains a small amount of chromic acid. When disposing the tube regardless of whether 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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