

# GASTEC Instructions for No.135L 1,1,1-Trichloroethane (Methyl Chloroform) Detector Tube

## FOR SAFE OPERATION :

Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump.

### ⚠ 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 you do not observe the following precautions, you may suffer injuries or damage to the product.

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).
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 of the test results, observe the following.

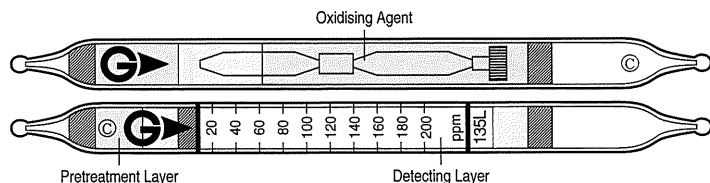
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may be interfered with by the coexisting gases. Please refer to the table "INTERFERENCES" below.
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 1,1,1-Trichloroethane in air or the industrial areas and environmental atmospheric condition.

### SPECIFICATION :

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



Measuring Range	6 – 20 ppm	20 – 200 ppm	200 – 900 ppm
Number of Pump Stroke	2	1	1/2
Correction Factor	0.3	1	4.5
Sampling Time	3 minutes per pump stroke		1.5 minutes
Detecting Limit	3 ppm (n=2)		
Colour Change	White → Pale pink		
Reaction Principle	1,1,1-Trichloroethane reacts with oxidising agent to produce intermediate products then it reacts with detecting agent to produce pale pink stain.		

**Coefficient of Variation : 10% (for 20 to 60 ppm), 5% (for 60 to 200 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 :

**Temperature :** Correct for temperature by the table below :

Temperature °C (°F)	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)
Correction Factor	2.5	2.0	1.6	1.25	1.0	0.8	0.6	0.5	0.4

**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 operating manual.
2. Break tips off a fresh primary tube and an analyser tube with the tube tip breaker of the pump.
3. Connect © marked ends with rubber tubing after breaking each end.
4. Insert the analyser tube into the pump inlet with arrow (➤) on the tube pointing toward pump.
5. Make certain the pump handle is all the way in. Align guide mark on the pump body with the guide mark on the handle.
6. Pull handle all the way out until it locks at one pump stroke (100 mL). Wait three minutes and confirm the completion of the sampling.
7. For smaller measurements less than 20 ppm, repeat the above sampling procedure one more time until the stain reaches to the first calibration mark.  
For measurements higher than 200 ppm, prepare a pair of fresh tubes and perform a half pump stroke.
8. Read concentration level at the interface where the stained reagent meets the unstained reagent.
9. If necessary, multiply the readings by the correction factors of temperature, pump strokes and atmospheric pressure respectively.

**INTERFERENCES :**

Substance	Interference	Changes colour by itself to
Halogens	+	Pale pink
Nitrogen oxides	+	Pale pink
Saturated halogenated hydrocarbons	+	Pale pink

This table of interference gases primarily expresses the interference of each coexisting gas in the gas concentration range, that is 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 Gastec representatives.

**APPLICATION FOR OTHER SUBSTANCES :**

Tube 135L can also be used for other substances as below :

Substance	Correction factor	No. of pump strokes	Measuring range
1,2-Dichloroethane	5.2	1	104 – 1040 ppm
1,1,2,2-Tetrabromoethane	0.046	4	0.92 – 9.2 ppm
1,2,3-Trichloropropane	1.8	4	36 – 360 ppm

**CORRECTION FACTOR :**

Detector tubes are primarily 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 representatives.

**DANGEROUS AND HAZARDOUS PROPERTIES :**

Threshold Limit Value-Time Weighted Average by ACGIH (2015) : 350 ppm

Threshold Limit Value-Short Term Exposure Limit by ACGIH (2015) : 450 ppm

**INSTRUCTIONS ON DISPOSAL :**

The reagent of the primary tube uses a small amount of hexavalent chromium. The reagent of the analyser tube uses a small amount of hexavalent chromium. When disposing the tube regardless of whether it has been used or not, follow the rules and regulations of your 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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