

GASTEC Instructions for No. 91LL Formaldehyde 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. Using non-Gastec parts or components in Gastec's detector tube and pump system or using a non-Gastec detector tube with a Gastec pump or using a Gastec detector tube with a non-Gastec pump may damage your detector tube and pump system, or may cause serious injuries, or death to the end-user. It will also void all warranties, and guarantees regarding performance and data accuracy.

! CAUTION: If you do not observe the following precautions, you may suffer injuries or damage the product.

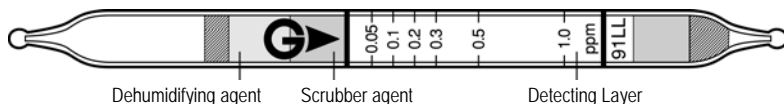
1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, broken pieces and reagent with bare hand(s).
3. The sampling time represents the time necessary to draw the air sample through the tube. The tube must be positioned in the desired sampling area for the entire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

! 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 10 - 35°C (50 - 95°F).
3. Use this tube within the relative humidity range of 15 - 90%.
4. This tube may be interfered with by the coexisting gases. Please refer to the table "INTERFERENCES" below.
5. The shelf life and storage condition of the tube are marked on the label of the tube box.

APPLICATION OF THE TUBE: Use this tube for detecting formaldehyde in industrial areas and for environmental atmospheric monitoring.

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



Measuring Range	0.05 - 1.0 ppm
Number of Pump Strokes	5
Stroke Correction Factor	1
Sampling Time	1.5 minutes per pump stroke
Detecting Limit	0.03 ppm (n = 5)
Colour Change	Yellowish Brown → Reddish Brown
Reaction Principle	$3\text{HCHO} + (\text{NH}_2\text{OH})_3\text{H}_3\text{PO}_4 \rightarrow \text{H}_3\text{PO}_4$ $\text{H}_3\text{PO}_4 + \text{Base} \rightarrow \text{Phosphate}$

Coefficient of Variation: 10% (for 0.05 to 0.3 ppm), 5 % (for 0.3 to 1.0 ppm)

**** Shelf Life:** Please refer to the validity date printed on the tube box.

**** Store the tubes at 10°C (50°F) or below in a refrigerator.**

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE:

Temperature: Since temperatures affect the tube, multiply the correction factor by the tube reading.

Temperature	°C	10	12	14	16	18	20	25	30	35
	(°F)	(50)	(53.6)	(57.2)	(60.8)	(64.4)	(68)	(77)	(86)	(95)
Correction Factor		4.0	2.6	1.8	1.4	1.2	1.0	0.8	0.6	0.4

Humidity: No correction is required.

Pressure: To correct for pressure, use the formula below:

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

MEASUREMENT PROCEDURE:

1. For checking the leakage of the pump, insert a freshly sealed detector tube into the pump. Follow the instructions provided with the pump operation manual.
2. Break the tips off the fresh detector tube with the tube tip breaker in the pump.
3. Insert the tube securely into the pump inlet with the arrow (**G**) on the tube pointing toward the pump.
4. Make certain the pump handle is all the way in. Align the guide marks on the pump body with the guide marks on the handle.
5. Pull the handle all the way out until it locks at one pump stroke (100 mL). Wait 1.5 minutes. Repeat the above sampling procedure four more times.
6. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
7. If necessary, multiply the readings by the correction factors of the temperature and atmospheric pressure respectively.

INTERFERENCES:

Substance	Concentration	Interference	Interference gas only
Ammonia		-	Faint dull yellow colour
Nitric Oxides		No	Pale pink around zero
Aldehydes	≥ 1/3	+ (Unclear demarcation)	Faint reddish brown
Ketones	≥ 1/1	+ (Unclear demarcation)	Faint reddish brown
Toluene	≤ 10 ppm	No	No discoloration

- 1) The prelayer removes the effect of nitrogen dioxide. When the prelayer becomes completely discoloured, the zero mark of the tube discolours to a faint dull pink colour regardless of the formaldehyde concentration. However, this concentration does not interfere with the tube reading.
- 2) This table of interference gases primarily expresses the interference of each coexisting gas in the concentration range, that is equivalent to the gas concentration. Therefore, the test result may show positive results due to other substances not listed in the table. If more information is needed, please contact us or our distributors in your territory.

DANGEROUS AND HAZARDOUS PROPERTIES:

Threshold Limit Value-Ceiling by ACGIH (2009) : 0.3 ppm
Explosive range: 7.0 - 73%

INSTRUCTIONS ON DISPOSAL: The reagent of the tube does not use toxic substances. 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 the quality of the tubes, please feel free to contact your Gastec representatives.

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