

GASTEC Instructions for No.91L Formaldehyde Low Range 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.

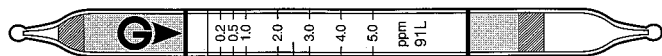
1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, pieces and reagent with bare hand(s).
3. The sampling time represents the time necessary to draw the air sample through the tube. The tube must be positioned in the desired sampling area for the entire sampling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

△ NOTES : For maintaining performance and reliability of the test result

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 by the coexisting gases. Please refer to the "INTERFERENCES".
5. Shelf life and storage conditions of the tube are marked on the label of the box of tube.

APPLICATION OF THE TUBE : Use of this tube for the detection of Formaldehyde 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.)



Detecting Layer

Measuring Range	0.1 - 5 ppm	5 - 40 ppm
Number of Pump Strokes	5	1
Correction Factor	1	8
Sampling Time	1.5 minutes per pump stroke	
Detecting Limit	0.05 ppm (n = 5)	
Color Change	Yellow - Reddish Brown	
Reaction Principle	<p>Formaldehyde reduces with hydroxylamine phosphate to liberate phosphorous acid, which discolors pH indicator to reddish brown.</p> $3\text{HCHO} + (\text{NH}_2\text{OH})_2\text{H}_3\text{PO}_4 \rightarrow \text{H}_3\text{PO}_4$ $\text{H}_3\text{PO}_4 + \text{Base} \rightarrow \text{Phosphoric Acid Salt}$	

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

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

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Temperature : Since the tube is affected by the temperature, multiply the correction factor to the tube reading.

Temperature (°C)	0	10	20	30	40
Temperature (°F)	32	50	68	86	104
correction Factor	1.50	1.20	1.0	0.85	0.70

Humidity : Humidity Correction is not required.

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

$$\frac{\text{Tube Reading (mg/m}^3\text{)} \times 1013 \text{ (hPa)}}{\text{Atmospheric Pressure (hPa)}}$$

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 detector tube in the tube tip breaker of the pump.
3. Insert the tube securely into pump inlet with arrow on the tube pointing toward pump.
4. Make certain pump handle is all the way in. Align guide marks on pump body and handle.
5. Pull handle all the way out until it locks on 1 pump stroke (100ml). Wait 1.5 minute.
6. In case the discoloration exceeded after 5 pump strokes sampling, replace by new tube and take 1 pump stroke to obtain true concentration.
7. Read concentration at the interface of the stained-to-unstained reagent.
8. If atmospheric correction is needed, refer to the "Corrections for Temperature, Humidity and Pressure".

INTERFERENCES :

Substance	Concentration	Interference	Change color by itself
Aldehydes		Plus error	Produce reddish brown stain
Ketones		Plus error	Produce reddish brown stain
Acid Gases		Plus error	Produce red stain
Organic acids		No effect	No stain by themselves

DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Ceiling by ACGIH (1998) : 0.3 ppm

APPLICATION FOR OTHER GASES :

Substance	Correction Factor	No. of Pump stroke					Measuring range
Diisobutyl ketone	5.8	4					0.58 - 29 ppm
Methaldehyde	0.65	3					0.065 - 3.25 ppm
Propionaldehyde	7.6	1					0.76 - 38 ppm
91L Tube Reading (n = 1)	0.2	0.5	1	2	3	4	5
Benzaldehyde (ppm)	2	4	9	22	40	63	92
91L Tube Reading (n = 1/2)	0.2	0.5	1	2	3	4	5
Cyclohexanone (ppm)	10	30	60	130	220	330	470

CORRECTION FACTOR : Detector tubes are primarily designed to measure specific gases.

But it is also possible to measure other substance of similar chemical properties with the aid of a correction factor or chart. A correction factor is a figure which is multiplied by the concentration interpreted from the color starting on the detector tube. The correction may also be presented as a chart on table if the correction relationship is nonlinear. Therefore, please make use of the correction factor / chart measuring ranges as a reference. Moreover, this factor may vary slightly between production batches. For a more precise factor please contact your Gastec distributor.

DISPOSAL INSTRUCTION : Reagent of the tubes does not use toxic substance. On 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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IM0091LE1
Printed in Japan
04C1Z