

GASTEC Instructions for No.174 1,3-Butadiene 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 guarantees.

⚠ 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, pieces or 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.

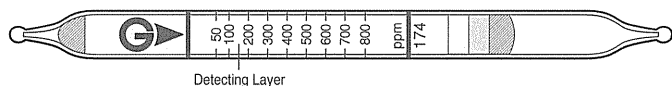
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may 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 detecting 1,3-Butadiene in the air or in industrial areas and for determining the environmental atmospheric condition.

SPECIFICATION :

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



Measuring Range	50 – 800 ppm
Number of Pump Strokes	1
Correction Factor	1
Sampling Time	1.5 minutes per pump stroke
Detecting Limit	10 ppm (n=1)
Colour Change	Pale yellow → White
Reaction Principle	$\text{CH}_2=\text{CHCH}=\text{CH}_2 + \text{PdSO}_4 + (\text{NH}_4)_2\text{MoO}_4 \rightarrow \text{Reaction product}$

Coefficient of Variation: 10% (for 50 to 200 ppm), 5% (for 200 to 800 ppm)

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

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

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Temperature : Correct for temperature by the table below.

Tube Reading (ppm)	True Concentration (ppm)								
	0°C (32°F)	5°C (41°F)	10°C (50°F)	15°C (59°F)	20°C (68°F)	25°C (77°F)	30°C (86°F)	35°C (95°F)	40°C (104°F)
800	—	—	—	—	800	755	710	685	660
700	—	—	850	775	700	665	630	615	600
600	900	800	700	650	600	575	550	535	520
500	710	635	560	530	500	480	460	445	430
400	550	500	450	425	400	380	360	350	340
300	410	375	340	320	300	287.5	275	267.5	260
200	260	240	220	210	200	192.5	185	180	175
100	120	115	110	105	100	97.5	95	90	85
50	65	60	55	52.5	50	47.5	45	42.5	40

Humidity : No correction is required.

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

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

* This value is after other correction(s), if applied any.

MEASUREMENT PROCEDURE :

1. For checking the leakage of the pump, insert a fresh sealed detector tube into the pump. Follow instructions provided with the pump operating manual.
2. Break tips off a fresh detector tube with the tube tip breaker of the pump.
3. Insert the tube into the pump inlet with arrow (➔) on the tube pointing toward pump.
4. Make certain the pump handle is all the way in. Align the guide mark on the pump body with the guide mark on the handle.
5. Pull the handle all the way out until it locks at one pump stroke (100 mL). Wait 1.5 minutes and confirm the completion of the sampling.
6. Read concentration level at the interface where the stained reagent meets the unstained reagent.
7. If temperature correction is necessary, obtain the true concentration by using the temperature correction table.
8. If pressure correction is necessary, use the pressure correction formula.

INTERFERENCES :

Substance	Concentration	Interference	Changes colour by itself to
Acetylene, Carbon monoxide	≥ 10 ppm	+	Blue
Ammonia, Hydrogen cyanide		+	White
Hydrogen	$\geq 20\%$	+	Blue for whole layer
Hydrogen sulphide	≥ 10 ppm	+	Black
Ethylene	≥ 1 ppm	+	Blue
Styrene		+	Pale blue

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 give a positive result from other substances not listed in the table. If more information is needed, please contact us or your Gastec representatives.

APPLICATION FOR OTHER SUBSTANCES :

Tube 174 can also be used for the other substances as below :

Substance	Correction factor	No. of pump strokes	Measuring range
1,3-Pentadiene	5.0	1	250 – 4000 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 a more precise factor please contact your Gastec representatives.

DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (2018) : 2 ppm

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 quality of the tubes, please feel free to contact your Gastec representatives.

Manufacturer : Gastec Corporation
 8-8-6 Fukayanaka, Ayase-City, Kanagawa 252-1195, Japan
<https://www.gastec.co.jp/>
 Telephone +81-467-79-3910 Facsimile +81-467-79-3979

IM00174E2
 Printed in Japan
 19B1Z