GASTEC No.2HH Instructions for Carbon Dioxide Extra High 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.

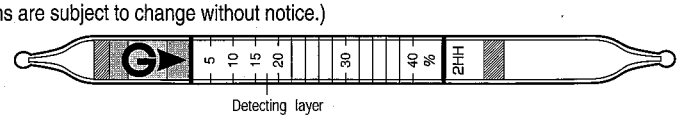
1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, pieces and reagent with bare hand(s).

△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℃(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 Carbon dioxide 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	2.5 - 5%	5 - 40%
Number of Pump Strokes	1	1/2 (50ml)
Correction Factor	1/2	1
Sampling Time	45 sec.	45 sec.
Detecting Limit	0.04% (n = 1)	
Color Change	Orenge → Yellow	
Reaction Principle	Carbone dioxide neutralize with potassium hydoxide to discolor the indicator to yellow stain. $CO_2 + 2KOH \rightarrow K_2CO_3 + H_2O$	

Coefficient of Variance:10%(for 5 to 10%), 5%(for 10 to 40%)

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

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

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Calibration of the Gastec detector Tube No.2HH is based on a tube temperature of 20 ℃ (68°F) and not the temperature of the gas being sampled, approximately 50% relative humidity and normal atmospheric pressure.

Temperature : Temperature correction is not required.

Humidity : Humidity correction is not required.

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

$$\frac{\text{Tube Reading (\%)} \times 1013\ \text{(hPa)}}{\text{Atmpheric Pressure (hPa)}}$$

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 into the pump inlet with arrow G► on the tube pointing toward pump.
4. Make certain pump handle is all the way in. Align guide marks of "50" on pump body and red guide mark of handle.
5. Pull the handle 1/2 stroke until it locks on half pump stroke (50ml). Wait 45 seconds and confirm the completion of the sampling.
6. For lower than 5% measurement, prepare fresh tube then pull 1 pump stroke.
7. Read concentration at the interface of the stained-to-unstained reagent.
8. If atmospheric correction is needed, refer to the "Corrections for Pressure".

INTERFERENCES :

Substance	Concentration	Interference	Change color by itself
Ammonia	Less than 8%	No effect	No discoloration
Hydrogen chloride	Less than 3%	No effect	Produce white at 4000ppm
Chlorine	Less than 1%	No effect	Produce white stain from 1000ppm
Hydrogen sulfide	Less than 1/15 times	No effect	Produce pale yellow from 1200ppm
Sulfur dioxide	Less than 2%	No effect	Produce pale yellow from 2400ppm
Nitrogen dioxide	Less than 1/5 times	No effect	Produce pale yellow from 50ppm
Ethanol	Less than 7%	No effect	Produce pale yellow from 2%
Acetic acid	Less than 2%	No effect	Produce pale yellow from 4500ppm
Trimethylamine	Less than 10%	No effect	No discoloration
Carbon monoxide, Nitric oxide		No effect	No discoloration
Ethylene, Propane		No effect	No discoloration

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 positivie result by the other substances not listed in the table. Please contact us or our distributors in your territory for more precise information if necessary,

DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (2003) : 5,000 ppm
Threshold Limit Value-short Term Exposure Limit by ACGIH (2003) : 30,000 ppm

DISPOSAL INSTRUCTION :

Reagent of the tube does not use toxic substances. 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.

Manufacturer : Gastec Corporation
6431 Fukaya, Ayase-City, 252-1103, Japan

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