

# GASTEC Instructions for No.112 Ethanol 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.

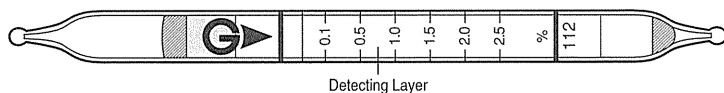
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may 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 Ethanol 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	0.01 - 0.05 %	(0.05) - 2.5 %	2.5 - 7.5 %
Number of Pump Strokes	2	1	1/2
Correction Factor	0.2	1	3
Sampling Time	1 minute per pump stroke		30 seconds
Detecting Limit	0.004 % (n = 2)		
Colour Change	Pale vermilion → Pale blue		
Reaction Principle	$C_2H_5OH + Cr^{6+} + H_2SO_4 \rightarrow Cr^{3+}$		

**Coefficient of Variation : 15% (for 0.05 to 0.5%), 10% (for 0.5 to 2.5%)**

**\*\*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 (%)	True Concentration (%)								
	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)
2.5	4.0	3.6	3.2	2.8	2.5	2.2	2.0	1.8	1.7
2.0	3.2	2.9	2.6	2.3	2.0	1.8	1.6	1.5	1.4
1.5	2.3	2.1	1.9	1.7	1.5	1.3	1.2	1.1	1.1
1.0	1.5	1.35	1.2	1.1	1.0	0.9	0.8	0.75	0.7
0.5	0.7	0.65	0.6	0.55	0.5	0.45	0.4	0.4	0.4
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

**Humidity :** No correction is required.

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

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

\* 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 (G) 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 one minute and confirm the completion of the sampling.
6. For smaller measurements less than 0.05 %, repeat the above sampling procedure one more time until the stain reaches the first calibration mark. For measurements higher than 2.5 %, prepare a fresh tube and perform a half pump stroke.
7. Read concentration level at the interface where the stained reagent meets the unstained reagent.
8. If temperature correction is necessary, obtain the true concentration by using the temperature correction table. Afterwards multiply the correction factor of pump stroke if necessary.
9. If pressure correction is necessary, use the pressure correction formula.

**INTERFERENCES :**

Substance	Interference	Changes colour by itself to
Carbon monoxide	No	No discolouration
Carbon dioxide	No	No discolouration
Alcohols	+	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.

**DANGEROUS AND HAZARDOUS PROPERTIES :**

Threshold Limit Value-Short Term Exposure Limit by ACGIH (2018) : 1,000ppm  
Explosive range : 3.3-19%

**INSTRUCTIONS ON DISPOSAL :**

The reagent of the tube uses a small amount of hexavalent chromium. When disposing of 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

IM00112E2  
Printed in Japan  
18K1Z