

# GASTEC Instructions for No.231 Sulphuryl Fluoride Detector tube

## FOR SAFE OPERATION :

Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump and dedicated Gastec Pyrotec Pyrolyzer (No. 860).

### ⚠ 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.
4. Do not operate Gastec Pyrotec Pyrolyzer near flammable liquids or in explosive atmospheres.

### ⚠ 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 0 - 35°C (32 - 95°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. Do not subject Gastec Pyrotec Pyrolyzer to strong vibrations or shocks. Damaged filament or circuit failure may change pyrolysis rate.
6. The shelf life and storage condition of the tube are marked on the label of the tube box.

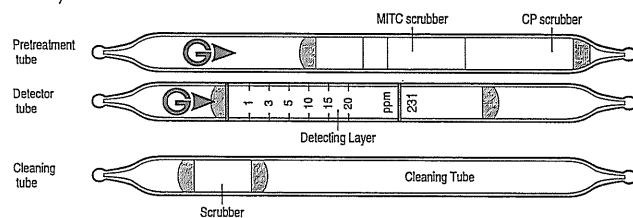
## APPLICATION OF THE TUBE :

Use this tube for detecting Sulphuryl Fluoride in the air or in industrial areas and for determining the environmental atmospheric condition.

Use this tube with Gastec Gas Sampling Pump and dedicated Gastec Pyrotec Pyrolyzer (No. 860).

## SPECIFICATION :

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



|                          |   |
|--------------------------|---|
| Measuring Range          | 1 - 20 ppm  |
| Number of Pump Strokes   | 3   |
| Stroke Correction Factor | 1   |
| Sampling Time            | 6 minutes   |
| Detecting Limit          | 0.4 ppm (n = 3)   |
| Colour Change            | Bluish purple → White   |
| Reaction Principle       | SO <sub>2</sub> F <sub>2</sub> → SO <sub>2</sub><br>SO <sub>2</sub> + I <sub>2</sub> + H <sub>2</sub> O → HI + H <sub>2</sub> SO <sub>4</sub> |

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

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

## CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

**Temperature :** Correct for temperature with the table below. :

| Tube Reading (ppm) | Temperature Correction (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) | 25°C(77°F) | 35°C(95°F) |
| 20                 | 28                           | 26        | 24         | 22         | 20         | 18         | 15.5       | 7.5        |
| 15                 | 21                           | 20        | 18.5       | 17         | 15         | 13         | 11         | 5.5        |
| 10                 | 14.5                         | 13.5      | 13         | 11.5       | 10         | 8.5        | 6.5        | 3          |
| 5                  | 8                            | 7.6       | 7          | 6.1        | 5          | 3.6        | 2          | 0.5        |
| 3                  | 5.5                          | 5.4       | 5          | 4          | 3          | 2          | 1          | —          |
| 1                  | 2.5                          | 2.3       | 2          | 1.5        | 1          | 0.7        | —          | —          |

**Humidity :** No correction is required.

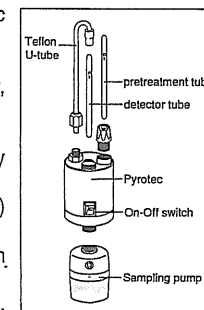
**Pressure :** To correct for pressure, use the formula below :

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

## MEASUREMENT PROCEDURE :

Before use, read the instructions provided with the pump and Gastec Pyrotec Pyrolyzer operation manual.

1. Set up Gastec Pyrotec Pyrolyzer and Gastec Gas Sampling Pump.
2. For checking the leakage of the pump and Gastec Pyrotec Pyrolyzer, insert a freshly sealed detector tube into the Pyrotec Pyrolyzer.
3. Turn on Gastec Pyrotec Pyrolyzer and wait for two minutes.
4. Break the tips off the fresh pretreatment tube and detector tube by snapping off each tube end in the tube tip breaker of the pump.
5. Insert tubes securely into Gastec Pyrotec Pyrolyzer with the arrow (➔) on the tube pointing toward Gastec Pyrotec Pyrolyzer (fig. 1).
6. 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.
7. Pull the handle all the way out until it locks at one pump stroke (100 mL).



8. Wait two minutes and confirm the completion of the sampling. Repeat the above sampling procedure two more times.
9. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
10. If necessary, multiply the readings by the correction factors of temperature and atmospheric pressure.
10. Displace residual gas in the routing of Gastec Pyrotec Pyrolyzer with clean air after use. (One cleaning tube is contained in a box. Each cleaning tube can be used 4 times.)
  - (a) Break the tips off the cleaning tube.
  - (b) Remove pretreatment tube and detector tube from Pyrotec Pyrolyzer and replace with cleaning tube in the place at detector tube.
  - (c) 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.

- (d) Pull the handle all the way out until it locks at one pump stroke (100 mL). Wait six seconds and confirm the completion of the sampling. Repeat the above sampling procedure 19 more times.
- (e) Remove the cleaning tube.

**INTERFERENCES :**

| Substance                    | Concentration   | Interference | Interference gas only |
|------------------------------|-----------------|--------------|-----------------------|
| Sulphur Dioxide              | $\geq 0.04$ ppm | +            | White at 0.05 ppm     |
| Carbon Dioxide               | $\leq 5$ %      | No           | No discolouration     |
| Chloropicrin(CP)             | $\leq 50$ ppm   | No           | No discolouration     |
| Methyl Isothiocyanate (MITC) | $\leq 50$ ppm   | No           | No discolouration     |
| Low Oxygen environment       |                 | +            | No discolouration     |

CP scrubber : The scrubber removes the effect of CP. When the scrubber agent becomes wholly discoloured, pyrolysis rate is decreased and lower test result may be given.

MITC scrubber : The scrubber removes the effect of MITC. If unreacted scrubber layer becomes 2mm or less, MITC may break through the scrubber and lower test result may be given.

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-Time Weighted Average by ACGIH (2012) : 5 ppm

Threshold Limit Value-Short Term Exposure Limit by ACGIH (2012) : 10 ppm

**INSTRUCTIONS ON DISPOSAL :**

The reagent of the cleaning tube and detector tube do not use toxic substance. The reagent of the pretreatment tube contains a small amount of hexavalent chromium. When dispose of the tube regardless of used or unused, follow the rules and regulations of the 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.

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

IM00231E1  
Printed in Japan  
12G1Z