GASTEC No.51 Instructions for Fluorochlorocarbons Pyro Tube

FOR SAFE OPERATION :

Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump and dedicated Gastec Pyrotec Pyrolyzer (No. 840).

⚠ 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 to the product.

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 results, observe the following.

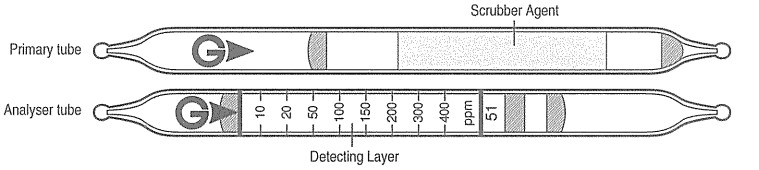
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40℃ (32 - 104℉).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may be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

SPECIFICATION :

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



Measuring Range	10 - 400 ppm
Number of Pump Stroke	1
Correction Factor	1
Sampling Time	2 minutes
Detecting Limit	2 ppm (n=1)
Colour Change	Yellow → Reddish purple
Reaction Principle	Pyrotec : Fluorochlorocarbons → Hydrogen halogenide Pyrotube : Hydrogen halogenide + Base → Chloride

****Shelf Life : Please refer to the validity date printed on the box of tube.**
****Store the tubes in the cool and dark place.**

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Temperature : No correction is required between 0 - 40℃ (32 - 104℉).
Humidity : No correction is required between 0 - 90% R.H.
Pressure : To correct for pressure, multiply the tube reading by

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

MEASUREMENT PROCEDURE :

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 pump. Follow the instructions provided with the pump and Gastec Pyrotec Pyrolyzer operation manual.
3. Turn on Gastec Pyrotec Pyrolyzer and wait for two minutes.
4. Break tips off a fresh primary tube and an analyser tube with the tube tip breaker of the pump.
5. Insert the primary tube and the analyser tube into Gastec Pyrotec Pyrolyzer with arrow ( ) on the tube pointing toward Gastec Pyrotec Pyrolyzer (fig. 1).
6. Make certain the pump handle is all the way in. Align guide mark on the pump body with the guide mark on the handle.
7. Pull handle all the way out until it locks at one pump stroke (100 mL). Wait two minutes and confirm the completion of sampling.
8. Read concentration level at the interface where the stained reagent meets the unstained reagent.
9. If necessary, multiply the readings by the correction factors of pump strokes and atmospheric pressure respectively.
10. Displace residual gas in the routing of Gastec Pyrotec Pyrolyzer with clean air after use.

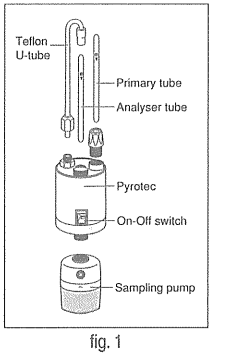


fig. 1

INTERFERENCES :

Substance	Interference	Changes colour by itself to
Hydrogen chloride	+	Reddish purple
Halogenated hydrocarbons	+	Reddish purple
Nitrogen dioxide	+	Reddish purple

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

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 be given positive result by the other substances not listed in the table. For more information is needed, please contact us or Gastec representatives.

APPLICATION FOR OTHER SUBSTANCES :

Tube 51 can also be used for other substances as below :

Substance	Correction Factor	No. of Pump Strokes	Measuring Range
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	1.0	1	10-400 ppm
1,1-Dichloro-1-fluoroethane (R141b)	2.5	1/2	400-1000 ppm
1,1-Dichloro-1-fluoroethane (R141b)	1.0	1	10-400 ppm
2,2-Dichloro-1,1,1-trifluoroethane (R123)	4.0	1/2	560-1600 ppm
2,2-Dichloro-1,1,1-trifluoroethane (R123)	1.4	1	14-560 ppm
Dichloropentafluoropropane (R225)	2.0	1	20-800 ppm
Chlorodifluoromethane (R22)	2.5	1	25-1000 ppm
Dichlorodifluoromethane (R12)	1.1	1	11-440 ppm
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	2.0	1	20-800 ppm
Enflurane	By scale	1	100-1230 ppm
Halothane	2.4	1	24-960 ppm
Methyl chloride	1.2	1	12-480 ppm
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	0.7	1	7-280 ppm
Trichlorofluoromethane (R11)	0.8	1	8-320 ppm
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	1.0	1	10-400 ppm
2-Chloro-1,1,1,2-tetrafluoroethane (R124)	4.5	1	45-1800 ppm

Enflurane

Enflurane (ppm)	100	350	525	670	780	1010	1230
Tube 51 Reading (n=1)	10	50	100	150	200	300	400

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 more precise factor please contact your Gastec representatives.

INSTRUCTIONS ON DISPOSAL :

The reagent of the primary tube uses a small amount of hexavalent chromium. The reagent of the analyser 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.

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IM0051E4
Printed in Japan
19K1Z