GASTEC No.51L Instructions for Fluorochlorocarbons 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. 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 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 sampling.

⚠ NOTES : For maintaining performance and reliability of the test results, observe the following.

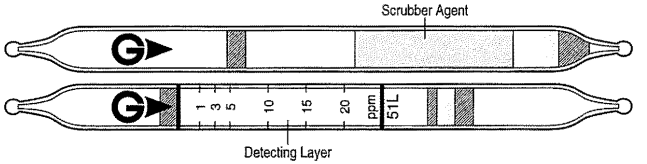
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40℃ (32 - 104℉).
3. Use this tube within the relative humidity range of 0 - 90%.
4. This tube may be 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. 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 Fluorochlorocarbons 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	1 - 20 ppm	20 - 54 ppm
Number of Pump Stroke	2	1
Stroke Correction Factor	1	2.7
Sampling Time	2 minutes per pump stroke	
Detecting Limit	0.2 ppm (n=2)	
Colour Change	Yellow → Reddish purple	
Reaction Principle	Pyrotec : Fluorochlorocarbons → HCL Pyrotube : HCl + Base → Chlorine	

**** 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 : No correction is required.
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 :

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 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 detector tube with the tube tip breaker in the pump.
5. Insert the tube securely into Gastec Pyrotec Pyrolyzer with the arrow (G►) 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). Wait two minutes and confirm the completion of the sampling. Repeat the above sampling procedure one more time.
8. For measurements higher than 20 ppm, prepare a fresh tube and perform one pump stroke.
9. Read the concentration level at the interface where the stained reagent meets the unstained

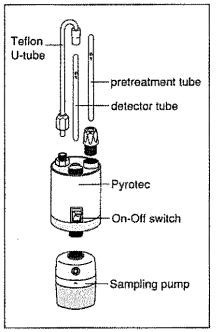


fig. 1

reagent.

10. If necessary, multiply the readings by the correction factors of pump strokes and atmospheric pressure.
11. Displace residual gas in the routing of Gastec Pyrotec Pyrolyzer with clean air after use.

INTERFERENCES :

Substance	Interference	Interference gas only
Hydrogen chloride, Nitrogen dioxide	+	Reddish purple
Halogenated hydrocarbons	+	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 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 Gastec representatives.

APPLICATION FOR OTHER SUBSTANCES :

Tube 51L 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 (R-113)	2.7	1	20-54 ppm
1,1,2-Trichloro-1,2,2-trifluoroethane (R-113)	1.0	2	1-20 ppm
Chlorodifluoromethane (R22)	6.75	1	50-135 ppm
Chlorodifluoromethane (R22)	2.5	2	2.5-50 ppm
Dichlorodifluoromethane (R12)	4.86	1	36-97.2 ppm
Dichlorodifluoromethane (R12)	1.8	2	1.8-36 ppm
1,1-Dichloro-1-fluoroethane(R141b)	1.1	2	1.1-22 ppm
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	4.86	1	36-97.2 ppm
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	1.8	2	1.8-36 ppm
2,2-Dichloro-1,1,1-trifluoroethane (R123)	1.4	2	1.4-28 ppm
Dichloropentafluoropropane (R225)	1.4	2	1.4-28 ppm
Enflurane	By chart	2	25-145 ppm
Halothane	3.0	2	3-60 ppm
Methyl Chloride	4.32	1	32-86.4 ppm
Methyl Chloride	1.6	2	1.6 – 32 ppm
Methylene Chloride	2.7	1	20 – 54 ppm
Methylene Chloride	1.0	2	1-20 ppm
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	2.7	1	20-54 ppm
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	1.0	2	1-20 ppm
Trichlorofluoromethane (R11)	2.16	1	16-43.2 ppm
Trichlorofluoromethane (R11)	0.8	2	0.8-16 ppm
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	2.16	1	16-43.2 ppm
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	0.8	2	0.8-16 ppm

(1) Enflurane

Tube 51 reading (n=2)	1	3	5	10	15	20
Enflurane concentration (ppm)	25	45	65	95	120	145

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 pretreatment tube uses a small amount of hexavalent chromium. The reagent of the detector tube does not use toxic substance. 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 the quality of the tubes, please feel free to contact your Gastec representatives.

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