

51L

GASTEC

**FLUOROCHLOROCARBONS LOW RANGE DETECTOR TUBE
CALIBRATED FOR TRICHLOROFLUOROETHANE R-113**

The Gastec Detector Tube No. 51L provides a rapid, fully quantitative analysis of the concentration of TRICHLOROFLUOROETHANE in air with an accuracy tolerance of $\pm 25\%$ utilizing the Gastec Multi-Stroke Gas Sampling Pump in conjunction with Model 840 Gastec Pyrotec Pyrolyzer.

PERFORMANCE :

Calibration Scale	1—20 ppm (based on 2 pump strokes)	
Measuring Range	1—20 ppm	20—54 ppm
Number of Pump Strokes	2	1
Correction Factor	Tube Reading \times 1	Tube Reading \times 2.7
Detecting Limit*	0.2 ppm	—
Sampling Time	2 minutes per pump stroke	
Color Change	Yellow—Reddish Brown	
Shelf Life	2 years	

MEASUREMENT PROCEDURE :

*Minimum detectable concentration.

The Gastec fluoro-chlorocarbons detector tube No. 51L is used with Gastec Pyrotec Pyrolyzer that pyrolyze halogenated hydrocarbons and measure the decomposed substances by the detector tube.

- Remove the inlet clamping nut from the Model 800 Gastec Gas Sampling Pump. Set the Pyrotec Pyrolyzer to the Sampling Pump.
- Push the power switch of the Pyrotec Pyrolyzer on and confirm that the battery of the Pyrotec Pyrolyzer is sufficient for use.
If the pilot lamp of the power switch does not light, replacement of the batteries is needed.
- Break tips off a fresh analyzer tube and a primary tube for pretreating sample by bending each tube end in the tube tip breaker of the pump.
- Connect the primary tube securely into the rubber inlet of the Pyrotec Pyrolyzer with tube arrow on the tube pointing toward the Pyrotec body. Also connect the analyzer tube to the rubber inlet of the sampling pump positioned on the center of Pyrotec Pyrolyzer with the arrow on the tube pointing toward the pump.
- Assemble for Teflon U-Tube with plastic hexagon screw and analyzer tube.
- Make certain the pump handle is all the way in. Align the guide marks on handle and pump body.
- Pull the handle all the way out until it locks on 1 pump stroke. Wait 2 minutes until staining stops. Repeat the above sampling procedure one more time.
- Read concentration at the interface of the stained-to-unstained reagent.
- After sampling, put the power switch of the Pyrotec Pyrolyzer off. To remove the remaining gas in the Pyrotec Pyrolyzer, connect used tubes with it and take 4 pump strokes in the fresh air.

APPLICATION FOR OTHER FLUOROCHLOROCARBONS GASES :

Name of Gases	Chemical Formula	Correction Factors n=2	Measuring Range
R-11 Trichloromonofluoromethane	CCl_2F	0.8	0.8—16 ppm
R-12 Dichlorodifluoromethane	CCl_2F_2	1.8	1.8—36 ppm
R-112 Tetrachlorodifluoroethane	$\text{CCl}_2\text{FCCl}_2\text{F}$	1.0	1.0—20 ppm
R-113 Trichlorotrifluoroethane	$\text{CClF}_2\text{CCl}_2\text{F}$	1.0	1.0—20 ppm
R-113b Trichlorotrifluoroethane	CCl_2CF_3	0.8	0.8—16 ppm

Name of Gases	Chemical Formula	Correction Factors n=2	Measuring Range
R-114 Dichlorotetrafluoroethane	$\text{CClF}_2\text{CClF}_2$	1.8	1.8—36 ppm
R-123 2, 2-Dichloro-1, 1, 1-trifluoroethane	CHCl_2CF_3	1.4	1.4—28 ppm
R-124 2-Chloro-1, 1, 1, 2-tetrafluoroethane	CHClFCF_3	7.0	7.0—140 ppm
R-141b 1, 1-Dichloro-1-fluoroethane	$\text{CH}_2\text{CCl}_2\text{F}$	1.1	1.1—22 ppm
R-142b 1-Chloro-1, 1-difluoroethane	CH_2CClF_2	1.9	1.9—38 ppm
R-225ca 3, 3-Dichloro-1, 1, 1, 2, 2-pentafluoropropane	$\text{CHCl}_2\text{CF}_2\text{CF}_3$	1.1	1.1—22 ppm
R-225cb 1, 3-Dichloro-1, 1, 2, 2, 3-pentafluoropropane	$\text{CHClFCF}_2\text{CClF}_2$	1.9	1.9—38 ppm
Halothane 2-Bromo-2-Chloro-1, 1, 1-trifluoroethane	CF_3CHBrCl	1.6	1.6—32 ppm
Enflurane 2-Chloro-1, 1, 2-trifluoroethyl difluoromethyl ether	$\text{CHClFCF}_2\text{OCHF}_2$	4.3	4.3—86 ppm
Isoflurane 1-Chloro-2, 2-trifluoroethyl difluoromethyl ether	$\text{CF}_3\text{CHClOCHF}_2$	2.1	2.1—42 ppm
Methyl Chloride	CH_3Cl	1.6	1.6—32 ppm
Dichloromethane	CH_2Cl_2	1.0	1—20 ppm

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Calibration of the Gastec detector tube No. 51L is based on a tube temperature of 20°C (68°F) and not the temperature of the gas being sampled, approximately 50% relative humidity and normal atmospheric pressure.

No correction is required for tube temperature of 0—40°C (32—104°F) and for relative humidity range of 0—100%. To correct for pressure, multiply by

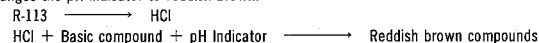
$$\frac{760}{\text{Atmospheric Pressure (mmHg)}}$$

CALIBRATION AND ACCURACY :

The Gastec detector tube No. 51L is carefully calibrated as an integral part of the manufacturing process. Calibration and accuracy test are performed using combinations of standard reference gas of known concentration and dynamic gas flow system and gas chromatographic technique.

DETECTION PRINCIPLE :

Halogenated hydrocarbons are pyrolyzed by the Pyrotec Pyrolyzer and produce hydrogen chloride which changes the pH indicator to reddish brown.

**INTERFERENCES :**

Other halogenated hydrocarbons produce similar stain by themselves.

DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (1994): 1,000 ppm (7—8 hours)

SEE OPERATING INSTRUCTIONS INCLUDED WITH THE GASTEC MULTI-STROKE GAS SAMPLING PUMP.

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956-51L-1
Printed in Japan