GASTEC No.21LA Instructions for Carbonyl Sulphide Detector Tube

FOR SAFE OPERATION:
Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump.

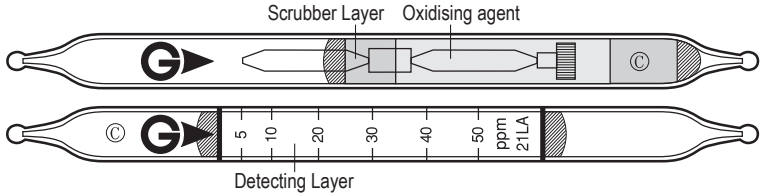
⚠WARNING:
1. Use only Gastec detector tubes in a Gastec pump.
2. Do not interchange or use non-Gastec parts or components in Gastec's detector tube and pump system.
3. Using non-Gastec parts or components in Gastec's detector tube and pump system or using a non-Gastec detector tube with a Gastec pump 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.

⚠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 - 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. 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 carbonyl sulphide 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	2 - 5 ppm	5 - 50 ppm	50 - 125 ppm
Number of Pump Strokes	2	1	1/2
Stroke Correction Factor	0.4	1	2.5
Sampling Time	3 minutes per pump stroke		1.5 minutes
Detecting Limit	0.8 ppm (2 pump stroke)		
Colour Change	Bluish Purple → White		
Reaction Principle	$COS + I_2O_5 + H_2SO_4 \rightarrow SO_2 + CO_2$ $SO_2 + I_2 + H_2O \rightarrow 2HI + H_2SO_4$		

Coefficient of Variation: 10% (for 5 to 10 ppm), 5 % (for 10 to 50 ppm)
**** Shelf Life: Please refer to the validity date printed on the tube box.**
**** Store the tubes at 10°C (50°F) or below in a refrigerator.**

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE:

Temperature: Correct for temperature with the table below.

Temperature °C (°F)	0(32)	5(41)	10(50)	15(59)	20(68)	25(77)	30(86)	35(95)	40(104)
Correction Factor	1.9	1.65	1.45	1.2	1.0	0.9	0.8	0.73	0.65

Humidity: No correction is required between 0 - 90% R.H.
Pressure: To correct for pressure, use the formula below

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

* This value is after other correction(s), if any, are applied.

MEASUREMENT PROCEDURE:
1. For checking the leakage of the pump, insert a freshly sealed detector tube into the pump. Follow the instructions provided with the pump operation manual.
2. Break the tips off the fresh primary tube and secondary tube by snapping off each tube end in the tube tip breaker of the pump.
3. Connect the © marked ends with rubber tubing after snapping off each end.
4. Insert the analyzer tube securely into pump inlet with the arrow (G►) on the tube pointing toward the pump.
5. 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.
6. Pull the handle all the way out until it locks at one pump stroke (100 mL). Wait three minutes.
7. For smaller measurements less than 5 ppm, repeat the above sampling procedure one more times until the stain reaches the first calibration mark. For measurements higher than 50ppm, prepare a fresh tube and perform a half pump stroke.
8. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
9. If temperature correction is necessary, obtain the true concentration by using the temperature correction factor. Afterwards multiply the correction factor of pump strokes if necessary.
10. If pressure correction is necessary, use the pressure correction formula.

INTERFERENCES:

Substance	Concentration	Interference	Changes colour by itself to
Carbon monoxide	≧500 ppm	Black	Black at 500 ppm
Sulphur dioxide Cabon disulphide		+	White
Cabon dioxide		No	No discoloration
Nitrogen dioxide	≧2 ppm	+	Discolours to brown at 2 ppm
Hydrogen sulphide	≦1,000 ppm	No effect at 1 pump stroke	*1
Butane, Propane	≦10%	No	Produces a black stain at the top of the discolored area

*1: If the primary tube is totally discolored, the analyser tube will be discolored white due to the effect of hydrogen sulphide.
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.

INSTRUCTIONS ON DISPOSAL: The reagent of the 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 the quality of the tubes, please feel free to contact your Gastec representatives.

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