

GASTEC Instructions for No. 31B Oxygen Detector Tube

FOR SAFE OPERATION:

Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump.

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. While sampling the gas, the white discoloured detecting layer will be heated by the reaction. Please be careful when handling it.

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. While sampling the gas scrubber, the reagent will absorb hydrogen chloride to turn the colour from blue to yellowish brown.
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 Oxygen 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	3 - 6%	6 - 24%
Number of Pump Strokes	1	1/2
Stroke Correction Factor	1/2	1
Sampling Time	1 minute	30 seconds
Detecting Limit	2% (n = 1)	
Colour Change	Black → White	
Reaction Principle	$O_2 + 4TiCl_3 + 6H_2O \rightarrow 4TiO_2 + 12HCl$	

Coefficient of Variation: 5 % (for 6 to 24 %)

**** 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 between 0 - 40 C (32 - 104 F).
Humidity: No correction is required between 0 - 90% R.H.
Pressure: To correct for pressure, use the formula below:

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

* 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 instructions provided with the pump operation manual.
2. Break tips off a fresh detector tube with the tube tip breaker in the pump.
3. Insert the tube into the pump inlet with the arrow () on the tube pointing toward the pump.
4. 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.
5. Pull handle out until it locks at the half pump stroke (50mL). Wait 30 seconds and confirm that the sampling has completed.
6. If the discolouration is before the first calibration mark (6%), prepare a fresh tube. Break off both ends of the tube and connect the tube to the pump. Pull the handle all the way out (100mL) and wait until the staining stops.
7. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
8. If necessary, multiply the readings by the correction factors of the pump strokes and atmospheric pressure respectively.

INTERFERENCES:

Substance	Concentration	Interference	Changes colour by itself to
Carbon monoxide		No	No discoloration
Carbon dioxide	≥40%	+	No discoloration

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.

NOTE : If more than 40% carbon dioxide coexists, the tube reading will be 1% higher than the true concentration. (At 21% oxygen concentration, the tube 31B indicates 22%.)

INSTRUCTIONS ON DISPOSAL: The detector tubes can be disposed as glass, concrete, or ceramic waste. Before disposing of an Oxygen detector tube, repeat the same procedures as the measurement and confirm that the colour of the detecting reagent changed from black to white in all layers because unused or unreacted black detecting reagent (Titanium trichloride) remaining in the Oxygen detector tube may generate Hydrogen chloride. 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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