

- ★ CAREFULLY READ THIS INSTRUCTION SHEET AND AIRBORNE LABS INTERNATIONAL (ALI) MANIFOLD METHOD INSTRUCTIONS PRIOR TO USING THIS PRODUCT THAT IS DESIGNED FOR CARBON DIOXIDE (CO₂) TESTING.
- ★ THIS DETECTOR TUBE IS DESIGNED AND CALIBRATED FOR USE ONLY WITH THE ALI MANIFOLD SYSTEM. IT IS NOT INTENDED FOR USE WITH A HAND OPERATED PUMP.
- ★ DO NOT DISCARD THIS INSTRUCTION SHEET UNTIL ALL THE TUBES IN THIS BOX ARE USED UP.

1. PERFORMANCE:

Measuring Range : 0.05 - 2.5 ppm v/v (*)
SO₂ in CO₂ Gas

(*) Graduations on the detector tube are based on a 660 scc gas sample volume.

Typical MDL : 0.025 ppm v/v

Maximum Manifold : 20 psig (**DO NOT EXCEED!!**)

Test Pressure

Manifold Flow rate : 165 scc/min for 4.0 min = 660 scc

/ Time / Volume

Colour Change : Blue Purple → Pure White

A slight tan stain of about 0.05 ppm mark is observed for SO₂-free, clean CO₂.
This small tan stain should not be mistaken for a pure white stain caused by SO₂.

Operating Temperature : 20 - 30 °C (68 - 86°F) (Correction is necessary.)

⚠ CAUTION

1. DETECTOR TUBE CONTAINS CHEMICAL REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

NOTICE

1. USE ONLY ALI PASSIVATED GAS MANIFOLDS. (GAS-1 OR GAS-5XL SERIES) OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. BEFORE TESTING, CHECK THE MANIFOLD AS PER ALI OPERATING INSTRUCTIONS.
3. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
4. STORE TUBES IN A COOL AND DARK PLACE (4 - 10 °C/39 - 50°F), AND USE BEFORE EXPIRATION DATE PRINTED ON TOP OF THE BOX.
5. PRIOR TO USE, READ CAREFULLY ITEM 7. USER RESPONSIBILITY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER A MEASUREMENT.

2. SAMPLING AND MEASUREMENT:

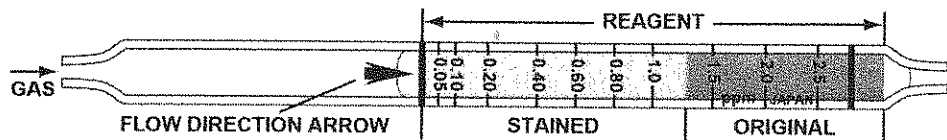


Fig.1

- ① Ensure that the proper 20 psig manifold delivery pressure is set, then briefly purge the transfer line and manifold with sample gas flow as per ALI instructions.
- ② Using a Cutter Tool, break open both ends of the detector tube and properly discard the broken ends.

⚠ CAUTION SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.

- ③ Insert the detector tube into the rubber manifold channel sleeve (Flow Direction Arrow must point UPWARD away from this sleeve).
- ④ Connect the manifold cap assembly to the detector tube's outlet end.

- ⑤ Ensure the manifold timer is set for a 4.0 minute test period.
- ⑥ Start the gas flow and quickly adjust the gas flow metering valve to achieve 165 scc/min constant flow.
- ⑦ On completion of the test period, shut off the gas flow and read the scale at the maximum point of the stained layer.
- ⑧ If SO₂ is present, a Pure White discoloration stain will appear up to the reading concentration.

SPECIAL NOTE I. The floating ball flowmeters used on gas manifolds are calibrated at 20°C (68°F) and 760 mm Hg (1013 hPa). Flowball readings obtained under other circumstances should be corrected accordingly. (REFER TO ITEM 3. SCALE CORRECTION FOR NON-STANDARD TEMPERATURE AND FLOWMETER BALL POSITION CORRECTION FOR LOW ATMOSPHERIC PRESSURE.)

II. When the maximum point of the stained layer is unclear or oblique, read the scale at the center between the longest and shortest points.

3. SCALE CORRECTION FOR NON-STANDARD TEMPERATURE CONDITIONS:

- ① Temperature; Correct the tube reading by the following temperature correction table.

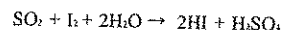
Tube Readings (ppm)	Temperature Correction Table	
	20 °C (68°F)	30 °C (86°F)
2.5	2.5	2.25
2.0	2.0	1.77
1.5	1.5	1.35
1.0	1.0	0.93
0.8	0.8	0.75
0.6	0.6	0.58
0.4	0.4	0.38
0.2	0.2	0.20
0.1	0.1	0.10
0.05	0.05	0.05

- ② Humidity; Dry CO₂ gas employed-No correction is necessary.
- ③ Atmospheric Pressure ; (If testing is performed at a high altitude location, the manifold flowmeter ball position for a true 165 scc/min CO₂ flow must be adjusted accordingly from that obtained at sea level 760 mm Hg conditions). Use of a pressure / temperature correction type flowmeter is required for a ball flowmeter / altitude effect adjustment.

4. INTERFERENCE:

Coexistence of Hydrogen Sulphide (H₂S) will produce a Pink stain and will give a higher reading. Coexistence of Nitrogen Dioxide (NO₂) or Ammonia (NH₃) will give a lower reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBES:

WHEN APPLICABLE, USED TUBES SHOULD BE DISPOSED OF ACCORDING TO RELEVANT LOCAL REGULATIONS.

7. USER RESPONSIBILITY:

It is the sole responsibility of the user of this equipment to ensure that the equipment is operated, maintained, and repaired in strict accordance with these detector tube instructions and the instructions provided by ALI for their gas manifold models. Detector tubes should not be used which are either beyond their expiration date or show a color change different from that stated in the performance specifications. The Manufacturer and Manufacturer's Distributors shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.