

# CARBON MONOXIDE LENGTH-OF-STAIN DETECTOR TUBES

(Concentration Chart Type)

**PERFORMANCE:**

Measuring Range	: 25 - 1000ppm	5 - 300ppm
Sampling Time	: 3 min. (1 pump stroke)	9 min. (3 pump strokes)
Colour Change	: Yellow - Dark brown	
Detectable Limit	: 1ppm (3 pump strokes)	
Storage Condition	: In a cool and dark place, not exceed 25°C (77°F)	
Aspirating Pump	: Model 400, 400A or AP-1	

FLOW CONTROL ORIFICE SUPPLIED WITH PUMPS PRIOR TO SEPTEMBER, 1985 SHOULD NOT BE USED WITH THIS TUBE.

READ CAREFULLY THE "USER RESPONSIBILITY" SECTION PRIOR TO USING THIS PRODUCT.

**SAMPLING AND MEASUREMENT:**

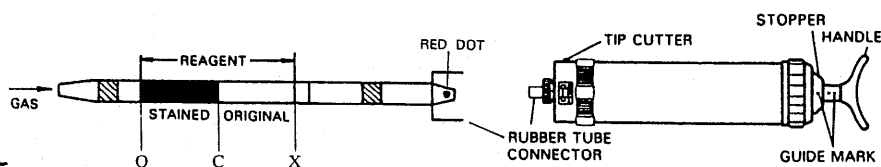


Fig. 1

1. Break both ends of a new detector tube by using the tip cutter.  
CAUTION: SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM AIRBORNE PIECES OF BROKEN GLASS AND SHARP CUT GLASS EDGES.
2. And insert the tube end with red dot sealed on the detector tube into the rubber tube connector as shown in Fig. 1.
3. Align the guide marks (red dots) on the shaft and stopper of the pump. Pull the handle at a full stroke and wait for 3 minutes. (In case of using the previous Model 400, turn the handle by 1/4 to lock after pulling it.)
4. Remove the detector tube from the rubber tube connector on the completion of sampling. Fit both edges of the reagent to the line "O" and "X" of CONCENTRATION CHART attached, then read the concentration with the top "C" of the stained layer.
5. In case of 3 pump strokes, push the handle without removing the detector tube from the pump inlet, and air in the pump will be discharged perfectly. Then repeat these pulling and pushing procedures twice, and read the concentration in accordance with the step 4.

**SPECIAL NOTE:**

When the top "C" of the stained layer is made obliquely, read the concentration at the centre between the longest and shortest points of the stained layer. The total stain length should be read, even if the stained layer gets multi-colour discolouration.

**CORRECTION FOR AMBIENT CONDITIONS:**

Temperature;

The concentration chart is calibrated based on the temperature of 20°C (68°F).

Readings obtained in other temperature circumstances should be corrected with temperature correction table on the CONCENTRATION CHART.

Humidity;

No corrections are necessary.

Atmospheric Pressure;

Tube readings can be corrected by using either the following equations:

True Concentration = Tube reading × 1013 / (Atmospheric pressure in mbar), or

True Concentration = Tube reading × 760 / (Atmospheric pressure in mmHg).

**INTERFERENCES:**

Coexistence of Ethylene more than 5,000 ppm gives higher readings. Coexistence of Sulphur dioxide more than 1/5 of Carbon monoxide gives higher readings. Coexistence of Nitrogen dioxide more than 1/5 of Carbon monoxide gives higher readings. Coexistence of Acetylene more than 1/5 of Carbon monoxide gives higher readings. Coexistence of Hydrogen more than 5,000 ppm changes the whole reagent to Yellowish grey.

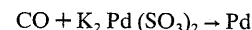
**HAZARDOUS AND DANGEROUS PROPERTIES OF CARBON MONOXIDE:**

T.L.V.♦: 25ppm

Explosive range in air: 12.5 - 74%

♦ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 1993.

**CHEMICAL REACTION IN THE DETECTOR TUBE:**



**INSPECTION OF ASPIRATING PUMP:**

Before testing, the pump shall be checked for proper performance. Leakage of air will affect accuracy of readings. The leakage check should be carried out by pulling the handle fully with unopened tube into the connector and waiting for 3 minutes. If the handle comes back throughly to the original position when the lock is released, the performance is good.

Any pump showing signs of leakage should be immediately removed from use until the leakage is corrected.

**CAUTION:**

Keep the detector tubes out of the reach of children and used tubes should be discarded carefully according to relevant regulations.

**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 instructions and the instructions provided with each Model 400, 400A or AP-1 aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour different than referenced under Performance Specifications.

The Manufacturer and Manufacturer's Distributor shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.