

- ★ READ THIS INSTRUCTION MANUAL AND THE INSTRUCTIONS OF THE ASPIRATING PUMP PRIOR TO USING THIS PRODUCT.
- ★ DO NOT DISCARD CAREFULLY THIS INSTRUCTION MANUAL UNTIL ALL THE TUBES IN THIS BOX ARE USED UP.

1. PERFORMANCE:

Measuring Range	: 1 - 10 ppm(*)	0.5 - 5 ppm	0.1 - 1 ppm
and Pump Stroke	: 1/2 pump stroke	1 pump stroke	5 pump strokes

(*) Graduations on the detector tube are based on 1 pump stroke.

Sampling Time	: 30 seconds	1 minute	5 minutes
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Colour Change: : Pale yellow → Pink

Detectable Limit: : 0.02 ppm (5 pump strokes)

Operating Temperature: : 0 - 40 °C (32-104°F)

(1) No temperature correction is necessary for 1 pump stroke or 1/2 pump stroke.

(2) Temperature correction is necessary for 5 pump strokes.

Aspirating Pump: : Model AP-20, AP-20S or 400B

⚠ CAUTION

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

NOTICE

1. USE ONLY WITH PUMP MODELS AP-20, AP-20S OR 400B. OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS. (REFER TO ITEM 8. INSPECTION OF ASPIRATING PUMP.) ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
3. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
4. STORE TUBES IN A COOL AND DARK PLACE (0-25 °C/32-77°F), AND USE BEFORE EXPIRATION DATE PRINTED ON THE TOP OF THE BOX.
5. PRIOR TO USE, READ ITEM 9. USER RESPONSIBILITY CAREFULLY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER DRAWING THE SAMPLE.

2. SAMPLING AND MEASUREMENT:

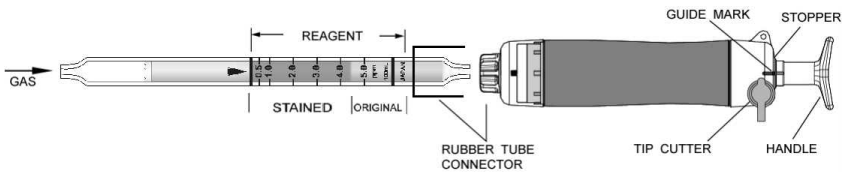


Fig.1

- ① Break both ends of the detector tube.

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

- ② Insert the detector tube into the aspirating pump securely as shown in Fig.1. (Arrow mark shall point to the pump.)
- ③ Align the guide marks on the shaft and stopper of the aspirating pump.
- ④ Pull the pump handle at a full stroke until it locks and wait for 1 minute or until the completion of sampling is confirmed with the flow indicator of the pump. (See descriptions about the flow indicator in the instruction manual of the pump.)
- ⑤ On completion of sampling, read the scale at the maximum point of the stained layer.
- ⑥ When the concentrations is over the scale range, a 1/2 pump stroke can be used to determine this higher concentration.
- ⑦ When the concentration is below the scale range, 5 pump strokes can be used to determine this lower concentration.

In case of 1/2 or 5 pump strokes, the following equation is available to obtain a true concentration.

$$1/2 \text{ pump stroke: True concentration} = \text{Tube reading} \times 2$$

$$5 \text{ pump strokes: True concentration} = \text{Temperature corrected concentration} \times 0.2$$

- ⑧ Determine the concentration of each mercaptans with the following equation.
 Concentration = Tube Reading × Conversion coefficient

Conversion Coefficient Table					
Name of gas	Coefficient	Name of gas	Coefficient	Name of gas	Coefficient
Methyl mercaptan	1.00	n-Propyl mercaptan	1.15	iso-Propyl mercaptan	1.15
Ethyl mercaptan	1.05	tert-Butyl mercaptan	1.10		

- SPECIAL NOTE:**
- I. The scale is calibrated at 20 °C (68°F), 50 %R.H. and 1013hPa. Readings obtained in other circumstances should be corrected. (**REFER TO ITEM 3. CORRECTION FOR AMBIENT CONDITIONS**).
 - II. When the maximum point of the stained layer is unclear or oblique, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

- ① Temperature ; 1 pump stroke or 1/2 pump stroke, no correction is necessary.
 5 pump strokes, The scale is calibrated based on the temperature of 20 °C (68°F). Reading obtained in other temperature circumstances should be corrected with the following temperature correction table.

Table of the coefficient for temperature correction (based on 20 °C)					
Temperature (°C)	0	10	20	30	40
Temperature correction	0.8	0.9	1	1.1	1.2

Procedure of temperature correction: Actual readings can be obtained by multiplying the readings of tubes by coefficient for temperature correction shown in the above. Therefore,

$$\text{True concentration (ppm)} = \text{Readings (ppm)} \times \text{Coefficient for temperature correction}$$

- ② Humidity ; 1 pump stroke or 1/2 pump stroke, no correction is necessary.
 5 pump strokes, no correction is necessary. (10-90%R.H.)

- ③ Atmospheric Pressure;

$$\text{True Concentration} = \text{Tube reading} \times \frac{1013}{\text{Atmospheric pressure (in hPa)}}$$

4. INTERFERENCE:

Arsine, Hydrogen selenide, Phosphine or Hydrogen sulphide produces a similar stain and will give higher reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

By reacting with silver compound, Acidic product is produced and pH indicator is discoloured.

6. DISPOSAL OF TUBES:

USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. HAZARDOUS AND DANGEROUS PROPERTIES OF MERCAPTANS :

TLV-TWA ♦ Methyl mercaptan : 0.5 ppm
 Ethyl mercaptan : 0.5 ppm

Explosion range in air : -

♦ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2020.

8. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

- ① Insert a sealed, unbroken detector tube into the pump.
- ② Align the guide marks on the shaft and stopper of the pump.
- ③ Pull the handle to full stroke and wait for 1 minute.
- ④ Unlock the handle and allow it to return slowly into the pump by holding the cylinder and handle securely.

CAUTION HANDLE WILL TEND TO SNAP BACK INTO THE PUMP QUICKLY.

- ⑤ If the handle returns completely to the original position, the performance is satisfactory.

Otherwise, refer to maintenance procedure in the instruction manual to correct the leakage.

9. 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 AP-20, AP-20S or 400B aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour change different to 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.

※ Product specifications are subject to change without any prior notice.