

Kitagawa

## BENZENE DETECTOR TUBES —IN PRESENCE OF OTHER AROMATIC HYDROCARBONS—

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

### 1. PERFORMANCE:

Measuring Range	1 - 80 ppm	0.2 - 1 ppm
and Sampling Time:	(2 minutes)	(10 minutes)
	(1 pump stroke)	(5 pump strokes)

Graduations on the detector tube are based on 1 pump stroke.

Colour Change:	White → Brown	
Detectable Limit:	0.1 ppm (5 pump strokes)	
Operating temperature:	0 - 40 °C (32-104°F) (Temperature correction is necessary.)	
Aspirating Pump:	Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A	

#### CAUTION

1. DETECTOR TUBE CONTAINS REAGENTS.
2. DON'T TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

#### NOTICE

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

### 2. SAMPLING AND MEASUREMENT:

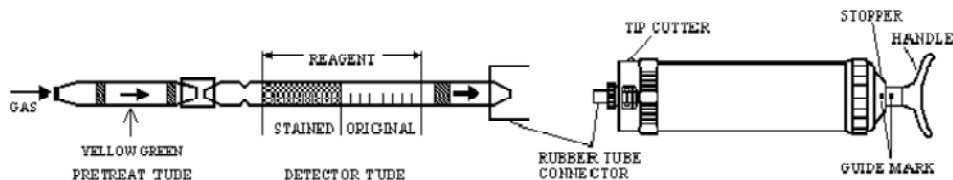


Fig.1

- ① Break both ends of detector tube (I) and pre-treat tube (II) by using the tip cutter, and connect each end of the detector tube (I) and pre-treat tube (II) with rubber tube connector as shown in Fig.1.  
(Arrow mark shall point to the pump)

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

- ② Insert the detector tube into 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 full stroke until it locks and wait for 2 minutes or until the completion of sampling is confirmed with the flow indicator of the pump (See descriptions about the flow indicator in the instructions of the pump).
- ⑤ On completion of sampling, read the scale at the maximum point of the stained layer.
- ⑥ When the concentration is below the scale range, 5 pump strokes can be used to determine this lower concentration.  
At this point, turn the handle right or left by 1/4 (90°), push it toward to the pump without removing the detector tube from the pump inlet and then repeat the step ③~④ for 4 times.

In case of 5 pump strokes, the following formula is available for true concentration.

$$\text{True concentration} = \text{Reading value} \times \frac{1}{5}$$

- SPECIAL NOTE:**
- I. The scale is calibrated at 20 °C (68°F) and 1013 hPa. Readings obtained in other circumstances should be corrected (REF. ITEM 3).
  - II. When the maximum point of the stained layer is unclear, read the scale at the centre between the longest and shortest points.

### 3. CORRECTION FOR AMBIENT CONDITIONS:

- ① Temperature; To Correct for temperature, multiply the tube reading by the following factors.

Temperature (°C)	0	1	2	3	4	5	6	7	8	9
Correction Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Temperature (°C)	10	11	12	13	14	15	16	17	18	19
Correction Factor	0.66	0.70	0.73	0.76	0.79	0.83	0.86	0.89	0.93	0.96
Temperature (°C)	20	21	22	23	24	25	26	27	28	29
Correction Factor	1.00	1.04	1.08	1.11	1.15	1.19	1.23	1.27	1.31	1.35
Temperature (°C)	30	31	32	33	34	35	36	37	38	39
Correction Factor	1.40	1.44	1.48	1.53	1.57	1.62	1.66	1.71	1.71	1.71
Temperature (°C)	40									
Correction Factor	1.71									

- ② Humidity; No corrections are necessary.

- ③ Atmospheric Pressure;

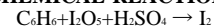
$$\text{True concentration} = \frac{\text{Temperature corrected concentration}}{\text{Atmospheric pressure (in hPa or mbar)}} \times 1013$$

### 4. INTERFERENCE:

In case of 1 pump stroke, each coexistence of 1,000 ppm or less of Toluene, Xylene or Ethyl benzene with Benzene will not affect to the accuracy of readings. (in case of 5 pump strokes, 200 ppm). Each coexistence of more than 2 ppm of Carbon monoxide with Benzene will change the whole reagent to pale brown, produce an unclear stain and give higher readings. More than 2 ppm of Hexane will produce very light brown discoloration.

\*If aromatic hydrocarbons such as Toluene, Xylene and Ethyl benzene are existing, the pre-treat tube will be discoloured to black or dark brown from the bottom of the original yellowish green layer.

### 5. CHEMICAL REACTION IN THE DETECTOR TUBE:



### 6. DISPOSAL OF TUBE:

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

### 7. HAZARDOUS AND DANGEROUS PROPERTIES OF BENZENE:

- ◆ T.L.V. : 0.5 ppm
- ◆ Explosive range in air : 1.2 - 8.0 %
- ◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2002.

### 8. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

- ① Insert 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 3 minutes.
- 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 pump instructions to correct the fault.

### 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, 400B, AP-1, AP-1S or 400A 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 Distributor shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.

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