

## Kitagawa SULPHURIC ACID DETECTOR TUBES

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

### 1. PERFORMANCE:

Measuring Range	: 0.5-5mg/m <sup>3</sup>
Number of pump strokes	: 5 (500ml)
Sampling Time	: 100 sec. / 5 pump strokes (20 sec./1 pump stroke)
Colour Change	: Yellow → Pink
Detectable Limit	: 0.2mg/m <sup>3</sup> (5 pump strokes)
Operating temperature	: 5-40 °C (41-104°F) (Temperature correction is necessary.)
Operating relative humidity	: 0-90 %
Aspirating Pump	: Model AP-1 or 400A

#### ▲CAUTION

1. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
2. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

#### NOTICE

1. THE USE OF ASPIRATING PUMPS OTHER THAN MODELS AP-1 OR 400A MAY CAUSE CONSIDERABLE ERROR IN INDICATION.
2. DO NOT 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. DO NOT 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"
7. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.

### 2. SAMPLING AND MEASUREMENT:

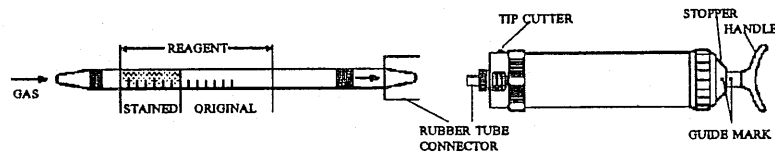


Fig.1

- ① Break both ends of detector tube.

▲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 pump handle to full stroke until it locks and wait for 20 seconds or until confirmation that sampling is completed (See descriptions of the flow indicator in the pump instructions).
- ⑤ Repeat the above sampling procedure four more times.
- ⑥ On completion of sampling, read the scale at the top of the stained layer.

**SPECIAL NOTE:** I. When the top of the stained layer is unclear or obliquely, read the scale at the centre between the longest and shortest points.

II. It is desirable to read the concentration immediately after measurement because the discoloured layer gets longer gradually.

### 3. CORRECTION FOR AMBIENT CONDITIONS:

- ① Temperature: The scale is calibrated based on the temperature of 20 °C (68°F). Readings obtained in other temperature circumstances should be corrected with multiply the tube reading by following factors.

Temperature	5 °C (41 °F)	10 °C (50 °F)	20 °C (68 °F)	30 °C (86 °F)	40 °C (104 °F)
Correction Factor	2.0	1.5	1.0	0.8	0.6

- ② Humidity: No corrections are necessary.

- ③ Atmospheric Pressure;

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

### 4. INTERFERENCES:

Hydrogen chloride, Hydrogen fluoride, Nitrogen dioxide, Nitric acid, and Chlorine produces respectively a similar stain and each coexistence with Sulphuric acid gives higher readings. Hydrogen sulphide and Sulphur dioxide do not affect the accuracy of readings.

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

The pH indicator is discoloured.

### 6. DISPOSAL OF TUBE:

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

### 7. HAZARDOUS PROPERTY OF SULPHURIC ACID:

T.L.V. ◆ 1mg/m<sup>3</sup>

◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 1999.

### 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 with 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-1, 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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