

INSTRUCTION MANUAL

No.159SC

Kitagawa OXYGEN 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 :	3 - 24 %	1.5 - 3 %
Sampling Time	1 minute	1.5 minutes
& Pump Strokes:	1/2 pump strokes	1 pump stroke
*Graduations on the detector tube apply to 1/2 pump strokes.		
Colour Change :	Black → White	
**When the concentration is less than 10 %, 3mm length of original colour (Black) stain is remained as it is. But, if the top of the discoloured layer is clear, read its point.		
Operating temperature: 0-45 °C (32-113°F)		
Aspirating Pump : Model AP-1 or 400A		

- CAUTION**
- DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN. (When the detector tube damages and reagent touch oxygen the hydrogen chloride occurs.)
 - KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

NOTICE

- THE USE OF ASPIRATING PUMPS OTHER THAN MODELS AP-1 OR 400A MAY CAUSE CONSIDERABLE ERROR IN INDICATION.
- DO NOT USE FLOW CONTROL ORIFICE WITH THIS TUBE. (FOR MORE DETAILS, REFER TO THE INSTRUCTIONS OF THE ASPIRATING PUMP.)
- BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS (REF. ITEM 8). ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
- DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
- 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.
- PRIOR TO USE, READ CAREFULLY ITEM 9 "USER RESPONSIBILITY" .

2. SAMPLING AND MEASUREMENT:

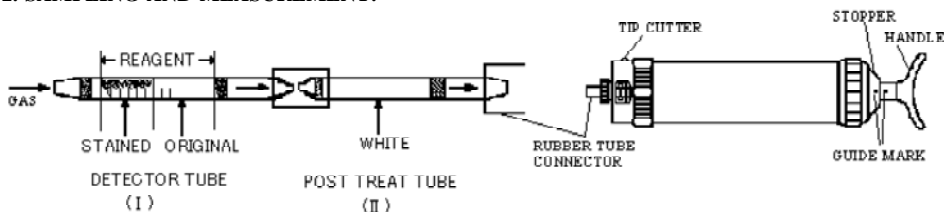


Fig.1

- Break both ends of a new post-treat tube (II) and one side end "A" of a new detector tube (I) by using the tip cutter, and connect them with the rubber tube as shown in Fig. 1.

WARNING (1) SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.

(2) CONNECT THE POST-TREAT TUBE BETWEEN THE DETECTOR TUBE AND ASPIRATING PUMP WITHOUT FAIL, AS SHOWN IN FIG.1. (Unless the post-treat tube is connected between the detector tube and aspirating pump, high concentration Hydrogen Chloride (HCl) will be exhausted from the detector tube.)

- Break another side end "B" of the detector tube (I) as the detector tube (I) and post-treat tube are

- Align the guide marks (red dots) on the shaft and stopper of the aspirating pump.
- Pull the pump handle at 1/2 pump strokes (to 50 ml line), and it will lock. Wait for 1 minute or until confirmation that sampling is completed (See descriptions of the flow indicator in the pump instructions.)

NOTE: Carry out quickly above steps ② to ④.

WARNING (3) THIS TUBE PRODUCES HEAT IN ITS NORMAL, AND WILL BE HOT TO THE TOUCH AS THE STAIN FORMS. TO AVOID POSSIBLE INJURY, ALLOW ADEQUATE COOLING TIME OR WEAR SAFETY GLOVES WHEN HANDLING RECENTLY USED TUBES.

- On completion of sampling, read the scale at the top of the stained layer.
- In case that concentration is less than 3 % with the above 1/2 pump stroke procedures, the following 1 pump stroke procedure is more available than the above 1/2 pump stroke procedure.
 - Repeat the above steps ① to ③.
 - Pull the handle at full stroke, and it will be automatically locked. Leave it for 1.5 minutes as it is or until confirmation that sampling is completed (See descriptions of the flow indicator in the pump instructions.
 - Remove the detector tube from the pump and read the concentration.
 - Then multiply the true concentration by 1/2.

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

3. CORRECTION FOR AMBIENT CONDITIONS:

- Temperature; No corrections are necessary.
- Humidity ; No corrections are necessary.
- Atmospheric Pressure ;

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

4. INTERFERENCE:

Each coexistence of Sulphur dioxide, Carbon dioxide, Nitrogen dioxide or Hydrogen sulphide with Oxygen does not affect accurate readings.

5. OXYGEN DEFICIENCY: Less than 18 %

6. CHEMICAL REACTION IN THE DETECTOR TUBE: $O_2 + TiCl_3 \rightarrow TiO_2$

7. DISPOSAL OF TUBE:

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

8. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

- Insert sealed, unbroken detector tube into the pump.
- Align the guide marks on the shaft and stopper of the pump.
- Pull the handle to full stroke and wait for 3 minutes.
- 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.

- 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.

connected, and insert the tube end of the post-treat tube (II) into the rubber tube connector of the aspirating pump securely as shown in Fig. (Arrow mark shall point to the pump.)

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