

- ★ 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:

Tube/box	: 10 tubes (10-time use)
Pump Stroke	: 1 (100mL)
Sampling Time	: 20 seconds
Shelf Life	: 1 year
Operating Temperature:	0 - 40 °C
Temperature & humidity compensation:	Unnecessary
Shape of the tube	



CAUTION

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

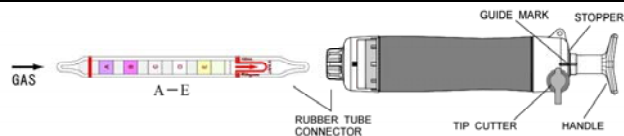
NOTICE

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. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS (REFER TO ITEM 6. 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 TOP OF THE BOX.
5. PRIOR TO USE, READ CAREFULLY ITEM 7. USER RESPONSIBILITY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.

2. SAMPLING AND MEASUREMENT:

Cut both ends of a fresh tube and connect it to the aspirating pump in accordance with the arrow mark printed and the following direction; and take 20 seconds for sampling.

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



CONNECTION OF NO.131 TUBE Pump: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A

With comparing each section of the sampled tube and original colour of a unused tube, confirm the discolouration of the each section. Discriminate kinds of inorganic gases in presence with referring to the discolouration and the following CHART 1. INORGANIC GAS QUALITATIVE DETECTION CHART

CHART 1. INORGANIC GAS QUALITATIVE DETECTION CHART

Section (Original colour)					*1) Substances (*2)
A (Pale purple)	B (Reddish purple)	C (White)	D (White)	E (Yellow)	
Yellow	-	-	-	-	1) Ammonia (5) 2) Amines (5)
-	Yellow	-	-	-	3) SO ₂ (10) 4) Acetic Acid (15)
-	Pink	-	-	-	5) Hydrogen chloride (20)
-	White	Yellowish orange	-	-	6) Chlorine (5)
-	-	Yellow	-	-	7) Nitrogen dioxide (5)
-	-	-	Brown	-	8) H ₂ S (10)
-	-	-	-	Pale blackish brown	9) CO (10)
-	-	-	-	Dark black	10) Phosphine (2)
-	-	-	-	Pale Yellowish green	11) Acetylene
-	-	-	-	Dark yellow	12) Methyl mercaptan (10)

NOTES

- (1) - : Undiscoloured
- (2) *1) : Item No. for quick reference to details in CHART 2.

(3) *2) : Detectable gas concentration limit of the substance (Unit: ppm)

The discolouration length is approx. 0.5 to 1.0mm

(4) Substances No.4), 11), and 12) are organic substances.

3. GAS-CONCENTRATION LEVEL AND DISCOLOURATION:

After the above discrimination of present gas kinds, it is suggested to use respective gas detector tubes for accurate quantitative analysis. However, it is possible to know gas-concentration levels roughly by confirming degrees of discolouration and referring to the following CHART 2.

CHART 2. CHART FOR GAS-CONCENTRATION LEVEL AND DISCOLOURATION

Inorganic Substances	Gas Concentration (ppm)	Section				
		A (Pale purple)	B (Reddish purple)	C (White)	D (White)	E (Yellow)
1) Ammonia	50	Yellow (I) Yellow (III)	-	-	-	-
2) Amines	50 5	Yellow (I) Yellow (III)	-	-	-	-
3) Sulphur dioxide (SO ₂)	50 10	-	Yellow (I) Yellow (III)	-	-	-
4) Acetic acid	30 15	-	Yellow (II) Yellow (III)	-	-	-
5) Hydrogen chloride	50 20	-	Pink (II) Pink (III)	-	-	-
6) Chlorine	20 5	-	White (I) White & Pale purple (II)	Yellowish orange	-	-
7) Nitrogen dioxide	20 5	-	-	Yellow (I) Yellow (I)	-	-
8) Hydrogen sulphide (H ₂ S)	100 10	-	-	-	Brown (I) Brown (I)	Brown (II) -
9) Carbon monoxide (CO)	50 10	-	-	-	-	Blackish brown (I) Pale blackish brown (I)
10) Phosphine	30 2	-	-	-	-	Black (II) Pale black (III)
11) Acetylene	50 10	-	-	-	-	Yellowish green (I) Pale yellowish green (I)
12) Methyl mercaptan	100 10	-	-	-	-	Pale yellow (I) dark yellow (II)

NOTES:

- (1) - : Undiscoloured
- (2) Discolouration level: I ; The whole layer is discoloured.
II ; A Half layer is discoloured.
III ; Approx. 0.5 - 1.0 mm of the layer is discoloured.
- (3) Substances No.4), 11) and 12) are organic substances.

4. NON-DISCOLOURATION CONFIRMED SUBSTANCES:

- 1) Hydrogen cyanide (HCN)
- 2) Carbon dioxide (CO₂)
- 3) Ethylene (Organic substance)
- 4) Nitric oxide (NO)

5. DISPOSAL OF TUBE:

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

6. 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.

7. 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 Distributors shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.