

(DIISOPROPYL AMINE, CYCLOHEXYL AMINE, DIBUTYL AMINE, DIPROPYL AMINE, N,N-DIMETHYL ANILINE, o-TOLUIDINE, p-TOLUIDINE, PYRIDINE, BUTYL AMINE, PROPYL AMINE, PENTYL AMINE, N-METHYL ANILINE AND MORPHOLINE WITH CONVERSION CHART)

- ★ 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	: 1 - 20 ppm(*)	0.5 - 10 ppm	0.2 - 4 ppm
and Sampling Time	: 1 minute	2 minutes	5 minutes
(*) Graduations on the detector tube are based on 1 pump stroke.			
Number of pump strokes	: 1 (100mL)	2 (200mL)	5 (500mL)
Colour Change	: Pale Purple → Pale Yellow		
Detectable Limit	: 0.1ppm (1 pump stroke)		
Operating temperature	: 0 - 40 °C (32-104°F) (No corrections is necessary.)		
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A		
By using conversion charts undermentioned (refer to ITEM 8. CONVERSION CHART), following gases can be detected.			

Gases to Measured	Measuring Range	Number of pump strokes	Sampling Time
Di-iso-Propyl amine	1 - 16 ppm	1 (100mL)	1 minute
*Cyclohexyl amine	1 - 20 ppm	1 (100mL)	1 minute
Di-n-Butyl amine	2 - 20 ppm	1 (100mL)	1 minute
Di-n-Propyl amine	1 - 14 ppm	1 (100mL)	1 minute
N,N-Dimethyl aniline	0.5 - 9 ppm	1 (100mL)	1 minute
o-Toluidine	2 - 22 ppm	1 (100mL)	1 minute
p-Toluidine	2 - 20 ppm	1 (100mL)	1 minute
**Pyridine	0.5 - 10 ppm	1 (100mL)	1 minute
n-Butyl amine	1 - 20 ppm	1 (100mL)	1 minute
Propyl amine	1 - 20 ppm	1 (100mL)	1 minute
Pentyl amine	2 - 22 ppm	1 (100mL)	1 minute
N-Methyl aniline	0.5 - 6 ppm	2 (200mL)	2 minutes
Morpholine	2 - 22 ppm	1 (100mL)	1 minute
Operating temperature	: 15 - 25 °C (59-77°F)		

*Cyclohexyl amine can be detected by using the same graduations for Ammonia in this tube.

**Pyridine: Divide the tube reading by two. (tube reading ÷ 2).

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 9. 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 10. USER RESPONSIBILITY**.
6. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.

2. SAMPLING AND MEASUREMENT:

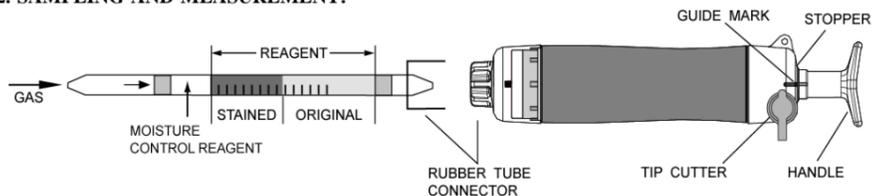


Fig.1

- 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 the pump handle at full stroke locked position 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 concentrations are below the scale range, multiple pump strokes can be used to determine these lower concentrations.
Use 2 or 5 pump strokes, then following formula is available for true concentration.

$$\text{True concentration} = \text{Tube reading} \times \frac{1}{\text{Number of pump strokes}}$$

- 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 obliquely, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

- ① Temperature; No correction is necessary
- ② Humidity; No correction is necessary.
- ③ Atmospheric Pressure;

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

4. INTERFERENCE:

Amines produce a similar stain and will give higher readings.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBE:

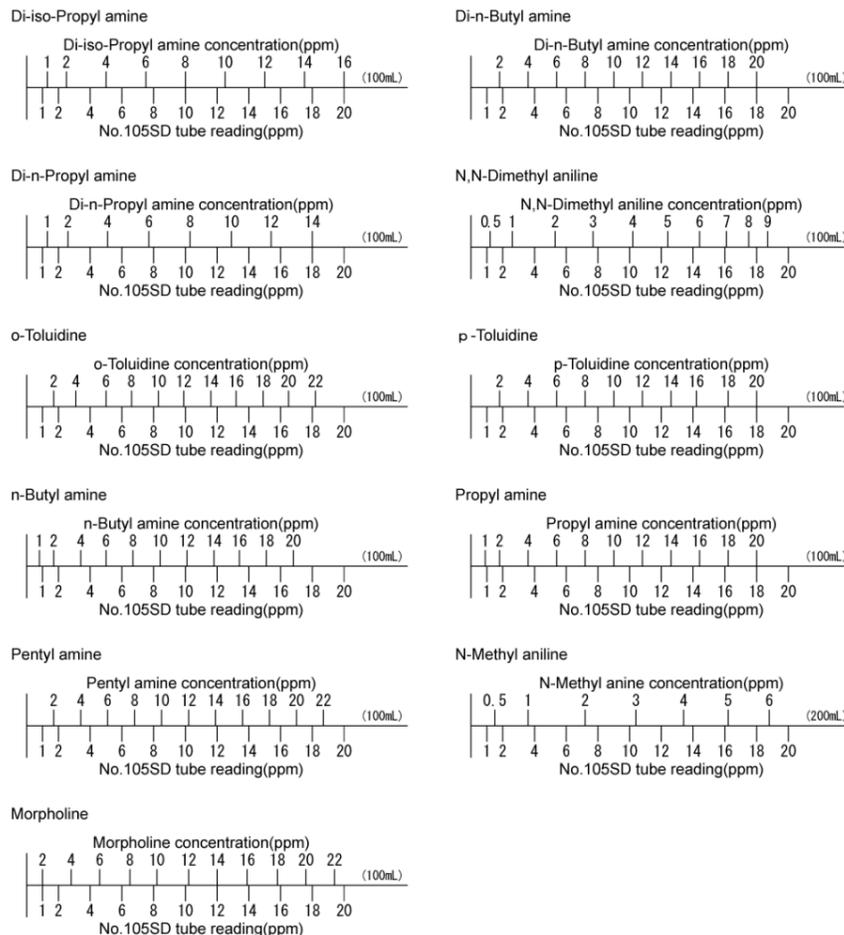
USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. THRESHOLD LIMIT VALUE (T.L.V.) OF EACH GAS:

Name of gas	Japan	U.S.A.	Name of gas	Japan	U.S.A.
Ammonia	25 ppm	25 ppm	p-Toluidine	-	2 ppm
Di-iso-Propyl amine	-	5 ppm	Pyridine	-	1 ppm
Cyclohexyl amine	-	10ppm	n-Butyl amine	*5ppm	C 5ppm
Di-n-Butyl amine	-	-	Propyl amine	-	-
Di-n-Propyl amine	-	-	Pentyl amine	-	-
N,N-Dimethyl aniline	5ppm	5ppm	N-Methyl aniline	-	0.5 ppm
o-Toluidine	1ppm	2ppm	Morpholine	-	20 ppm

*: Maximum Threshold Limit Value, C : TLV-C

8.CONVERSION CHART



9. 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 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 of the pump to correct the leakage.

10. 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.

Kitagawa AMMONIA DETECTOR TUBES

- ★ 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	0.5 - 30 %
and Sampling Time:	1 minute (1 pump stroke)
Colour Change:	Pink → Blue brownish green
Detectable Limit:	100 ppm
Operating temperature:	0 - 40 °C (32-104°F) (Temperature correction is necessary.)
Aspirating Pump:	Model AP-1, AP-1S, 400A or AP-400

-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-1, AP-1S, 400A OR AP-400. 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:

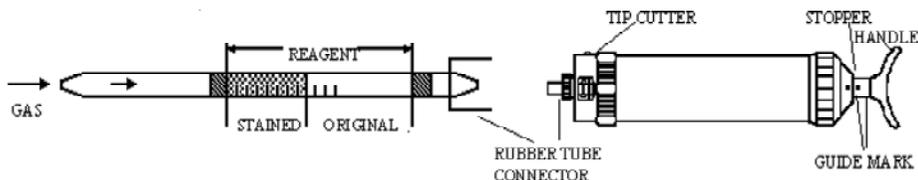


Fig.1

- ① Break both ends of detector tube.

-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 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 instructions of the pump).
NOTE: If using Model AP-400, pull pump handle to full stroke and turn the handle by 1/4 (90°), then wait for 1 minutes.

- ⑤ On completion of sampling, read the scale at the maximum point of the stained layer.

SPECIAL NOTE: I. The scale is calibrated at 20 °C (68°F) and 1013hPa. 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; Correct the tube reading by following temperature correction table.

Tube Readings (%)	Temperature Correction Table				
	Corrected Concentration (%)				
	0 °C (32°F)	10 °C (50°F)	20 °C (68°F)	30 °C (86°F)	40 °C (104°F)
30	-	35.0	30.0	27.0	25.0
25	35.0	30.0	25.0	23.0	21.0
20	28.0	24.0	20.0	18.0	17.0
15	22.0	18.0	15.0	13.0	12.0
10	15.0	12.0	10.0	9.0	8.0
5	8.0	6.0	5.0	4.5	4.0
2	3.0	2.5	2.0	1.9	1.8
1	1.2	1.1	1.0	1.0	0.9
0.5	0.5	0.5	0.5	0.5	0.5

- ② Humidity; No corrections are necessary.

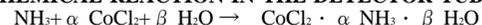
- ③ Atmospheric Pressure;

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

4. INTERFERENCES:

Hydrogen sulphide blacks the whole reagent, but does not affect readings if the top of discolouration by Ammonia is clear, Ammonia do not affect reading.

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 AMMONIA:

T.L.V.◆ : 25 ppm

Explosive range in air : 15.0 - 28 %

◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2000.

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. (If using Model AP-400, turn the handle by 1/4 (90°) to lock it.)
- 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-1, AP-1S, 400A or AP-400 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.