GL Sciences

INSTRUCTION MANUAL
AMMONIA DETECTOR TUBE

No.105SD

(DI-iso-PROPYL AMINE, CYCLOHEXYL AMINE, DI-n-BUTYL AMINE, DI-n-PROPYL AMINE, N,N-DIMETHYL ANILINE, o-TOLUIDINE, p-TOLUIDINE, PYRIDINE, n-BUTYL AMINE, PROPYL AMINE, PENTYL AMINE, N-METHYL ANILINE AND MORPHOLINE DETECTION WITH RESPECTIVE CONVERSION CHARTS)

★ 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 pump stroke	: 1 pump stroke	2 pump strokes	5pump strokes

(*) Graduations on the detector tube are based on 1 pump stroke.

Sampling Time	: 1 minute	2 minutes	5 minutes
Colour Change	Pale Purple → Pale Yellow		
Detectable Limit	: 0.1ppm (1 pump stroke)		
Operating temperature	: 0 - 40 ℃ (32-104°F) (No correction is necessary.)		
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A		

By using conversion charts shown at **ITEM 8. CONVERSION CHART**, following gases can be detected.

Gases to be Detected	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 ℃ (59-77°F)		

*Cyclohexyl amine can be detected by using the same graduations for Ammonia.
**Pyridine: Divide the tube reading by two. (tube reading ÷ 2).

⚠CAUTION
1. THE DETECTOR TUBE CONTAINS CHEMICAL REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES WERE 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 ℃/32-77°F), AND USE BEFORE EXPIRATION DATE PRINTED ON THE 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:

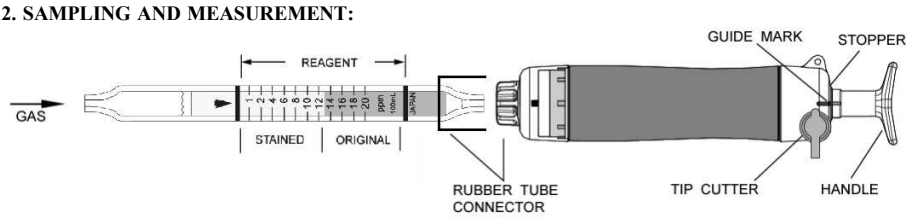


Fig.1

① Break both ends of the detector tube.

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

② Insert the detector tube into the aspirating pump securely as shown in Fig.1. (Arrow mark shall point to the pump.)
③ Align the guide marks on the handle and stopper of the aspirating pump.
④ Pull the pump handle at a 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 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 equation 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 ℃ (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 oblique, 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 gives higher reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

$2NH_3+H_3PO_4 \rightarrow (NH_4)_2HPO_4$

6. DISPOSAL OF TUBE:
USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

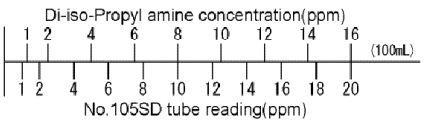
7. THRESHOLD LIMIT VALUE （T.L.V.）OF EACH GAS:

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

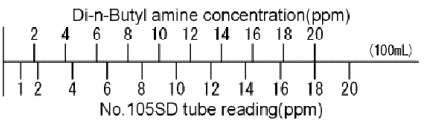
* ACGIH: American Conference of Governmental Industrial Hygienists, 2010
**C : TLV-C

8. CONVERSION CHART

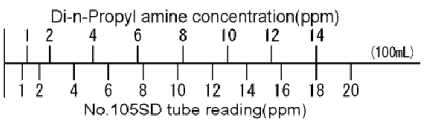
Di-iso-Propyl amine



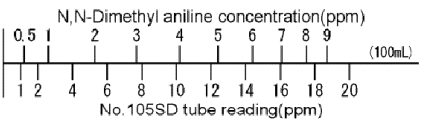
Di-n-Butyl amine



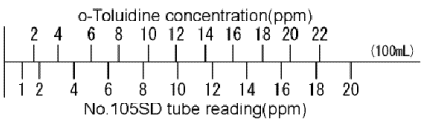
Di-n-Propyl amine



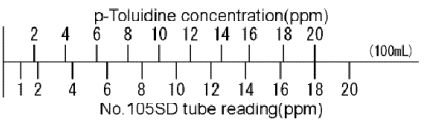
N,N-Dimethyl aniline



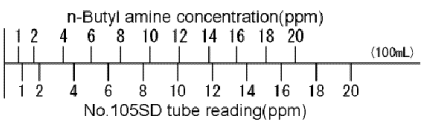
o-Toluidine



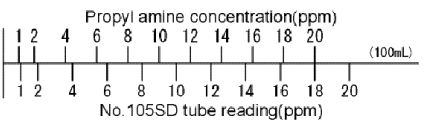
p -Toluidine



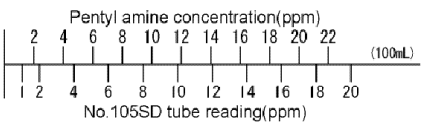
n-Butyl amine



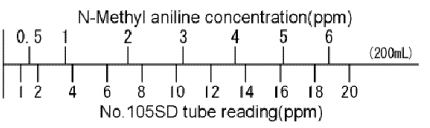
Propyl amine



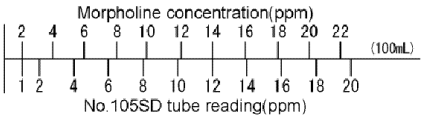
Pentyl amine



N-Methyl aniline



Morpholine



9. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

① Insert a sealed and unbroken detector tube into the pump.
② Align the guide marks on the shaft and stopper of the pump.
③ Pull the handle to a 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 procedures shown 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.

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