GL Sciences

INSTRUCTION MANUAL
ACRYLONITRILE DETECTOR TUBE

No.128SC

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

1. PERFORMANCE:

Measuring Range and Pump Stroke	: 1 - 120 ppm : 2 pump strokes
Sampling Time	: 3 minutes
Colour Change	: Yellow → Pink
Detectable Limit	: 0.5 ppm
Operating Temperature	: 0 - 40 ℃ (32-104°F) (Temperature correction is necessary.)
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A

⚠CAUTION
1. THE DETECTOR TUBE AND PRETREAT TUBE CONTAIN 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 8. 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 REFRIGERATED PLACE (0-10 ℃/32-50°F), AND USE BEFORE EXPIRATION DATE PRINTED ON THE TOP OF THE BOX.
5. PRIOR TO USE, READ **ITEM 9. USER RESPONSIBILITY** CAREFULLY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER DRAWING THE SAMPLE.

2. SAMPLING AND MEASUREMENT:

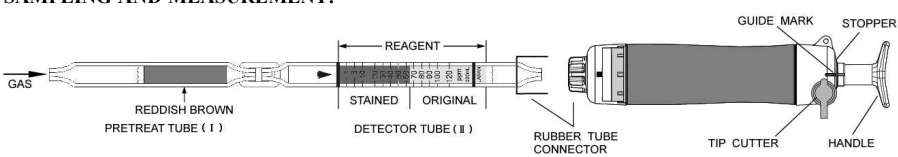

Fig.1

① Break both ends of the pretreat tube (Ⅰ) and detector tube (Ⅱ), and connect each end of the pretreat tube and detector tube with connecting tube as shown in Fig.1.

⚠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 shaft and stopper of the aspirating pump.
④ Pull the pump handle at a full stroke until it locks and wait for 1.5 minutes 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 Turn the pump handle right or left by 1/4 (90°), push it toward the pump without removing the detector tube from the pump and repeat the step ③～④ once more.
⑥ On completion of sampling, read the scale at the maximum point of the stained layer.

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; Correct the tube reading by following temperature correction table.
No temperature correction is necessary at less than 5ppm.

Temperature Correction Table					
Tube Readings (ppm)	Corrected Concentration (ppm)				
	0 ℃ (32°F)	10 ℃ (50°F)	20 ℃ (68°F)	30 ℃ (86°F)	40 ℃ (104°F)
120	165	140	120	104	90
100	142	117	100	87	77
90	127	105	90	79	70
80	112	93	80	70	62
70	98	81	70	62	55
60	84	70	60	53	48
50	69	58	50	45	41
40	55	46	40	37	34
30	41	34	30	28	27
20	26	22	20	20	20
10	12	10	10	10	10
5	5	5	5	5	5

② Humidity; No correction is necessary.

③ Atmospheric Pressure;

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

4. INTERFERENCE:

Hydrogen cyanide produces a similar stain and the coexistence of more than 2ppm gives higher readings. Coexistence of more than 600ppm of Methyl ethyl ketone, 350ppm of Styrene or 200ppm of Butadiene gives lower readings.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

$CH_2{=}CHCN + CrO_3 + H_2SO_4 \rightarrow HCN$

$2HCN + HgCl_2 \rightarrow 2HCl + Hg(CN)_2$

6. DISPOSAL OF TUBES:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF ACRYLONITRILE :

TLV-TWA ◆ : 2 ppm

Explosion range in air : 3.0 - 17.0 %

◆ Threshold Limit Value established by American Conference of Governmental Industrial Hygienists 2012.

8. 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 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.

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-20, AP-20S, 400B, AP-1, AP-1S or 400A aspirating pump, and that detector tubes are not used 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.

※ Product specifications are subject to change without any prior notice.

IME1282/2

Printed in Japan