

- ★ THIS DETECTOR TUBE IS USED WITH THE EXCLUSIVE USE MODEL S-20 SERIES AIR SAMPLER.
- ★ READ CAREFULLY THIS INSTRUCTION MANUAL AND THE INSTRUCTIONS OF THE SAMPLING 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	: 0.01 - 0.50 ppm (12.5 - 625 $\mu\text{g}/\text{m}^3$)
Sampling Volume	: 3.5L (350mL / min. \times 10 min.)
Sampling Time	: 10 minutes
Colour Change	: Yellowish orange \rightarrow Pink
Detectable Limit	: 0.005 ppm
Operating Temperature	: 10 - 35 $^{\circ}\text{C}$ (50 - 95 $^{\circ}\text{F}$) (Temperature correction is necessary.)
Operating Humidity	: 5 - 90%R.H. (No correction is necessary.)
Sampling Pump	: Model S-20 Series air sampler

⚠ 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. AS THE SAMPLING AND MEASUREMENT PROCEDURE OF EACH SAMPLER IS DIFFERENT, READ THE INSTRUCTION MANUAL OF EACH SAMPLER CAREFULLY BEFORE USE AND THEN MAKE A MEASUREMENT.
2. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
3. STORE TUBES IN A REFRIGERATED PLACE (0-10 $^{\circ}\text{C}$ /32-50 $^{\circ}\text{F}$), AND USE BEFORE EXPIRATION DATE PRINTED ON THE TOP OF THE BOX.
4. PRIOR TO USE, READ CAREFULLY **ITEM 8. USER RESPONSIBILITY.**
5. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.
6. THE ORIGINAL COLOUR (TONE OF THE YELLOWISH ORANGE) OF REAGENT IN THE TUBE MAY DIFFER WITH MANUFACTURING LOT, BUT IT CAN BE COMPLETELY DISTINGUISHED FROM PINK STAIN BY FORMALDEHYDE AND ACCURACY OF READINGS IS NOT AFFECTED.

2. SAMPLING AND MEASUREMENT:

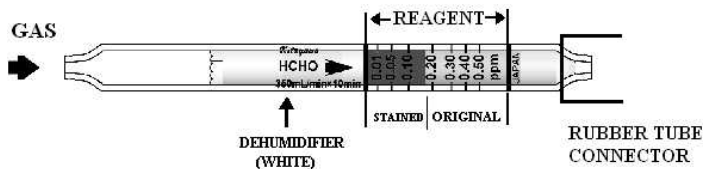


Fig.1

- ① Break both ends of the detector tube with attached ampule cutter.

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

- ② Connect the detector tube into the rubber tube connector of the Model S-20 series air sampler as shown in Fig. 1 (Arrow mark shall point to the sampler.), and fix it into the detector tube holder.
- ③ Turn ON power of the air sampler.
- ④ In accordance with instruction manual of each air sampler, preset the TIMER at 10 minutes and adjust the flow rate at 350mL/min.
- ⑤ After completion of sampling (10 minutes), remove the detector tube from the tube holder and read the scale at the maximum point of a stained layer.

- SPECIAL NOTE:**
- I. The scale is calibrated at 20 $^{\circ}\text{C}$ (68 $^{\circ}\text{F}$), 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.

III. It is desirable to read the concentration immediately after measurement because the stained layer becomes longer gradually.

(NOTE) In case of measuring higher concentration Formaldehyde, Tube No.710A is available.
 Measuring range of Tube No.710A for Formaldehyde: 0.05 - 2.0 ppm

3. CORRECTION FOR AMBIENT CONDITIONS:

① Temperature; Correct the tube reading by following temperature correction table.

Tube Reading (ppm)	Temperature Correction Table					
	Corrected Concentration (ppm)					
	10 °C (50 °F)	15 °C (59 °F)	20 °C (68 °F)	25 °C (77 °F)	30 °C (86 °F)	35 °C (95 °F)
0.50	—	0.780	0.500	0.390	0.340	0.290
0.40	0.900	0.520	0.400	0.310	0.270	0.230
0.30	0.550	0.370	0.300	0.230	0.200	0.170
0.20	0.330	0.250	0.200	0.155	0.135	0.115
0.10	0.150	0.120	0.100	0.080	0.070	0.060
0.05	0.070	0.060	0.050	0.040	0.035	0.030
0.01	0.020	0.015	0.010	0.008	0.007	0.006

② Humidity; No correction is necessary.

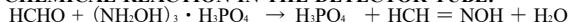
③ Atmospheric Pressure;

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

4. INTERFERENCE:

Ammonia or Amines itself does not affect the discolouration. But more than 1.0 ppm each of them are coexisting, the stained layer is faded from the zero end of the detecting reagent. (Inlet side of the tube) Nitrogen dioxide produces a similar stains and the coexistence of more than 1.0 ppm cause the maximum point of stained layer to be unclear and gives higher readings. Acetaldehyde or Acetone produces a similar stain and gives higher readings. Ethanol does not affect the discolouration by itself. But the coexistence of more than 200 ppm ethanol gives higher readings.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBES:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF FORMALDEHYDE:

TLV-STEL ◆ : 0.3 ppm (Ceiling)

Explosion range in air : 7.0 - 73 %

◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2010.

8. 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 S-20 series air sampler, 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.