

- ★ 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 - 0.12 ppm	0.04 - 0.48 ppm
13 - 150 $\mu\text{g}/\text{m}^3$	50 - 600 $\mu\text{g}/\text{m}^3$
(Printed scale)	(4 x Reading value)

Sampling Volume : 9 L	3 L
Sampling Time : 300 mL/min x 30min.	300 mL/min x 10min.
Colour Change : Yellowish Orange(*) → Pink	
(*) 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 the accuracy of reading value is not affected.	
Detectable Limit: 0.005 ppm (300 mL/min x 30min.)	
Operating temperature: 10 - 35°C (50-95° F) (Temperature correction is necessary.)	
Operating humidity : 5~90%RH	
Sampling Pump : Model S-20 Series air sampler (S-23E and S-25N)	

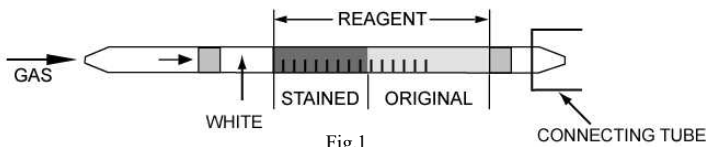
⚠ CAUTION

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 THE SAMPLING PUMPS WITH THE ABILITY OF 300mL/min. FLOW RATE POSSIBLE WHEN THE 710 DETECTOR TUBE CONNECTED.
2. THE SAMPLING AND MEASURING PROCEDURE IS DIFFERENT WITH DEPENDING ON MODEL OF AIR SAMPLER. THEREFORE, READ THE INSTRUCTION MANUAL OF EACH SAMPLER CAREFULLY BEFORE USE AND THEN MAKE A MEASUREMENT.
3. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
4. STORE TUBES IN A REFRIGERATED PLACE (0-10 °C/32-50°F), AND USE BEFORE EXPIRATION DATE PRINTED ON TOP OF THE BOX.
5. PRIOR TO USE, READ CAREFULLY ITEM 8. USER RESPONSIBILITY .

2. SAMPLING AND MEASUREMENT:



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

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

- ② Insert the detector tube into connecting tube of Model S-20 series air sampler, and fix it into the detector tube holder.
- ③ Turn ON power of Model S-20 series air sampler.
- ④ Preset the TIMER at 30 minutes.
- ⑤ In accordance with the instruction manual of each air sampler, preset the TIMER (Hours) at 30 minutes and adjust the sampling amount at 300mL/min.
- ⑥ After completion of sampling (30 minutes), remove the detector tube from the tube holder and read the scale at the maximum point of the stained layer.
- ⑦ In case of measuring at the temperature other than 20 °C (68°F) circumstance, obtain temperature correction coefficient from temperature correction table undermentioned and correct readings of detector tube.
- ⑧ If the discolouration is over the scale, preset the TIMER at 10 minutes instead of 30 minutes and repeat through the above procedures (measurement) again.
- ⑨ After completion of sampling (10 minutes), remove the detector tube from the tube holder and read the scale at the maximum point of the stained layer. And, correct the reading value with the temperature correction table undermentioned and multiply the corrected value by 4.

- SPECIAL NOTE:** I. When the maximum point of the stained layer is oblique, read the scale at the centre between the longest and shortest points.
 II. It is desirable to read the concentration immediately after measurement because the stained layer gets 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; The scale is calibrated based on the temperature of 20 °C (68°F). Readings obtained in other temperature circumstances should be corrected with the following temperature correction table.

Table of the coefficient for temperature correction

Temp.(°C)	0	1	2	3	4	5	6	7	8	9
10	1.40	1.36	1.32	1.28	1.24	1.20	1.16	1.12	1.08	1.04
20	1.00	0.97	0.94	0.91	0.88	0.85	0.82	0.79	0.76	0.73
30	0.70	0.67	0.64	0.61	0.58	0.55	—	—	—	—

Procedure of temperature correction :

Actual reading can be obtained by multiplying reading of tubes by coefficient for temperature correction shown in above table.

Actual Formaldehyde concentration (ppm) =

$$\text{reading value (ppm)} \times \text{Coefficient for temperature correction}$$

Procedure to get coefficient for temperature correction from the table.

In case of temperature of 23 °C, the arrow pointed 0.91 which is found by proportional allotment of 20 °C and 3 °C in the table is the coefficient for temperature correction.

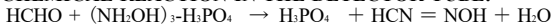
Table of the coefficient for temperature correction

Temp.(°C)	0	1	2	3	4	5
10	1.40	1.36	1.32	1.28	1.24	1.20
20	1.00	0.97	0.94	0.91	0.88	0.85
30	0.70	0.67	0.64	0.61	0.58	0.55

4. INTERFERENCE:

Ammonia or amines itself will not affect the discolouration. But, each coexistence of more than 0.5 ppm with Formaldehyde will cause the discolouration layer to fade from the bottom of stained layer. Nitrogen dioxide will produce a similar stain and the coexistence of more than 0.5 ppm with Formaldehyde will cause the maximum point of stained layer to be unclear and will give higher reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBE:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF FORMALDEHYDE:

TLV-TWA: ◆: 0.3 ppm

Explosive range in air : 7.0-73 %

- ◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2005.

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-23E or S-25N 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.