

GENERAL HYDROCARBONS LENGTH-OF-STAIN DETECTOR TUBES

(Type S)

(Direct Reading Type)

PERFORMANCE:

Gases to be measured	: iso-Butane · Pentane · n-Hexane · Heptane · Octane · Cyclohexane · Kerosine · Mineral turpentine
Sampling Time	: 50 - 1,400ppm (as n-Hexane) The scale printed on the tube is calibrated based on n-Hexane.
Sampling Time	: 1.5 minutes (1 pump stroke) As for measuring Kerosine or Mineral turpentine, the sampling time is 3 minutes (2 pump strokes).
Detectable Limit	: 5ppm (1 pump stroke)
Colour Change	: Orange - Yellowish green
Storage Condition	: In a cool and dark place, not exceed 25°C (77°F)
Aspirating Pump	: Model 400, 400A or AP-1

FLOW CONTROL ORIFICE SUPPLIED WITH PUMPS PRIOR TO SEPTEMBER, 1985 SHOULD NOT BE USED WITH THIS TUBE.  
READ CAREFULLY THE "USER RESPONSIBILITY" SECTION PRIOR TO USING THIS PRODUCT.

SAMPLING AND MEASUREMENT:

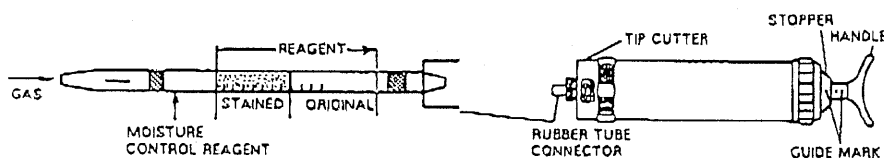


Fig. 1

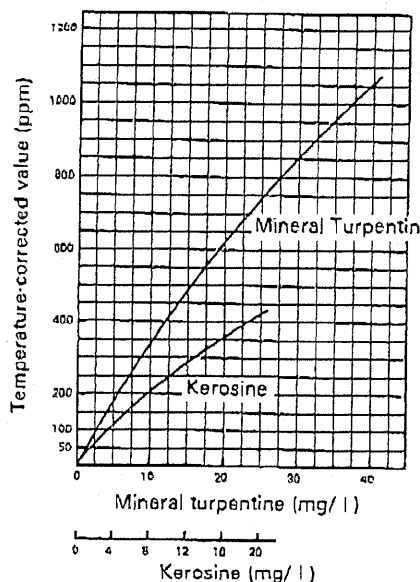
1. Break both ends of a new detector tube by using the tip cutter.  
CAUTION: SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM AIRBORNE PIECES OF BROKEN GLASS AND SHARP CUT GLASS EDGES.
2. And insert the tube end securely according to the direction of printed arrow mark into the rubber tube connector as shown in Fig. 1.
3. Align the guide marks (red dots) on the shaft and stopper of the pump. Pull the handle at a full stroke and wait for 1.5 minutes. (In case of using the previous Model 400, turn the handle by 1/4 to lock after pulling it.)
4. Remove the detector tube from the rubber tube connector on the completion of sampling. A reading can be obtained directly from the scale printed on the detector tube.
5. Determine the concentration of General hydrocarbons with the following equation and conversion coefficient table.

(Concentration) = (Temperature-corrected value) × (Conversion coefficient)

\*As stated below (ref. CORRECTION FOR AMBIENT CONDITIONS), no temperature correction is necessary as for iso-Butane and Pentane.

Name of gas	Coefficient	Name of gas	Coefficient
iso-Butane	0.8	Heptane	1.5
Pentane	0.8	Octane	2.0
n-Hexane	1.0	Cyclohexane	1.0

6. As for measuring Kerosine or Mineral turpentine, push the handle toward the aspirating pump without removing the detector tube from the pump inlet after step 4, pull the handle at a full stroke and wait for 1.5 minutes furthermore.
7. Remove the detector tube from the rubber tube connector on the completion of sampling.
8. Determine the concentration with the conversion graph, shown in Graph 1.



Graph 1. Conversion graph

SPECIAL NOTE:

1. When the top of the stained layer is made obliquely, read the concentration at the centre between the longest and shortest points of the stained layer. The total stain length should be read, even if the stained layer gets multi-colour discolouration.
2. As for Kerosine and Mineral turpentine, a little various results shall be given by difference of compositions.

**CORRECTION FOR AMBIENT CONDITIONS:**

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. Note that no temperature correction is necessary as for iso-Butane and Pentane.

Scale Readings (ppm)	Temperature Correction Table				
	True Concentration (ppm)				
	0°C (32°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
1,400	1,630	1,530	1,400	1,270	1,180
1,200	1,400	1,320	1,200	1,090	1,010
1,000	1,170	1,100	1,000	910	840
800	930	870	800	720	670
600	700	660	600	550	500
400	460	430	400	360	330
200	220	210	200	180	170
100	100	100	100	100	100

Humidity;

No corrections are necessary.

Atmospheric Pressure;

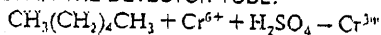
Tube readings can be corrected by using either the following equations:

True Concentration = Tube reading × 1013 / (Atmospheric pressure in hPa), or

True Concentration = Tube reading × 760 / (Atmospheric pressure in mmHg)

**INTERFERENCES:**

Coexistence of Alcohols, Esters or Ketones up to 6% respectively does not affect the accuracy of readings. Coexistence of Aromatic hydrocarbons changes the bottom of the stained layer to Black and gives higher readings.

**CHEMICAL REACTION IN THE DETECTOR TUBE:****INSPECTION OF ASPIRATING PUMP:**

Before testing, the pump shall be checked for proper performance. Leakage of air will affect accuracy of readings. The leakage check should be carried out by pulling the handle fully with unopened tube into the connector and waiting for 3 minutes. If the handle comes back throughly to the original position when the lock is released, the performance is good.

Any pump showing signs of leakage should be immediately removed from use until the leakage is corrected.

**CAUTION:**

Keep the detector tubes out of the reach of children and used tubes should be discarded carefully according to relevant regulations.

**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 400, 400A or AP-1 aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour different than referenced under 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.