

GASTEC
ACROLEIN DETECTOR TUBE

The Gastec Detector Tube No. 93 provides a rapid, fully quantitative analysis of the concentration of ACROLEIN in air with an accuracy tolerance of $\pm 25\%$ utilizing the Gastec Multi-Stroke Gas Sampling Pump.

PERFORMANCE :

Calibration Scale	10—800 ppm (based on 2 pump strokes)	
Measuring Range	3.3—50 ppm	10—800 ppm
Number of Pump Stroke	4	2
Correction Factor	1/3	1
Detecting Limit*	2 ppm	
Sampling Time	2 minutes per pump stroke	
Color Change	Yellow—Red	

* Minimum detectable concentration.

SHELF LIFE :

Please refer to the term of validity on a Tube Box Label.

MEASUREMENT PROCEDURE :

- Break tips off a fresh detector tube by bending each tube end in the tube tip breaker of the pump.
- Insert the tube securely into the rubber inlet of the pump with the arrow on the tube pointing toward the pump.
- Make certain the pump handle is all the way in. Align the guide marks of the handle and pump body.
- Pull the handle all the way out until it locks on 1 pump stroke (100 ml). Wait 2 minutes and unlock the handle by making 1/4 turn in either direction to return it to the starting position. Repeat this procedure one more time for 2 pump stroke (200 ml) sampling, without removing the tube.
- Read concentration at the interface of the stained-to-unstained reagent, after completion of 2 pump stroke (200 ml) sampling.
- For more accurate measurement of such a lower concentration as less than 50 ppm, use 4 pump stroke (400 ml) sampling, in which case the true concentration is obtained by dividing the tube reading by 3.

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :

Calibration of the Gastec Detector Tube No. 93 is based on a tube temperature of 20°C (68°F) and not the temperature of the gas being sampled, approximately 50% relative humidity, and normal atmospheric pressure.

- For tube temperature other than 20°C, tube reading must be corrected according to the temperature correction table below :

Tube Readings (ppm)	True Concentration (ppm)				
	0°C (32°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
800	—	2,000	800	300	200
600	4,600	1,550	600	250	170
400	3,600	1,000	400	200	140
200	1,900	600	200	130	90
100	550	200	100	75	50
50	250	80	50	35	25
20	60	40	20	15	10

- No correction is required for relative humidity range of 0—100%. In case the tube is used under the humidity more than 80% RH (14 mg/l), the discoloration becomes pale, but does not affect the accuracy.
- Tube reading is proportional to absolute pressure. To correct the tube reading for pressure, multiply by

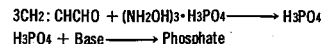
$$\frac{760}{\text{Atmospheric Pressure (mmHg)}}$$

CALIBRATION AND ACCURACY :

The Gastec detector tube No. 93 is carefully calibrated as an integral part of the manufacturing process. Calibration and accuracy test are performed using combination of dynamic diffusion tube method and gas chromatographic technique.

DETECTION PRINCIPLE :

Acrolein reacts with hydroxylamine phosphate to liberate phosphorous acid, which discolors pH indicator to red.

**INTERFERENCES :**

Substance	Concentration	Interference	Changes color by itself to
Acetaldehyde	$\geq 1/5$	+	} Red
Acetone	≥ 1	+	
Methyl ethyl Ketone	≥ 3 times	+	
Ammonia	—	—	} No
Sulfur dioxide	$\geq 1/5$	+	

Chlorine, hydrogen chloride and nitric acid are trapped in the pretreatment (yellow) layer.

APPLICATION FOR OTHER SUBSTANCES :

Substance	Correction	No. of pump strokes	Measuring range
Formaldehyde	Factor: 25	1	250 to 20000 ppm

CORRECTION FACTOR :

Detector tubes are primarily designed to measure specific gases. But it is also possible to measure other substances of similar chemical properties with the aid of a correction factor or chart. A correction factor is a figure which is multiplied by the concentration interpreted from the color starting on the detector tube. The correction may also be presented as a chart on tube if the correction relationship is nonlinear. Therefore, please make use of the correction factor/chart measuring ranges as a reference. Moreover, this factor may vary slightly between production batches. For a more precise factor please contact your Gastec distributor.

DANGEROUS AND HAZARDOUS PROPERTIES :

Threshold Limit Value-Time Weighted Average by ACGIH (1997) : 0.1 ppm (7—8 hours)
Threshold Limit Value-Short Term Exposure Limit by ACGIH (1997) : 0.3 ppm (15 minutes)
Flammable Limit : 2.8—31%

TUBE MUST BE STORED AT TEMPERATURE 5°C (41°F) BELOW.

SEE OPERATING INSTRUCTIONS INCLUDED IN THE GASTEC MULTI-STROKE GAS SAMPLING PUMP.