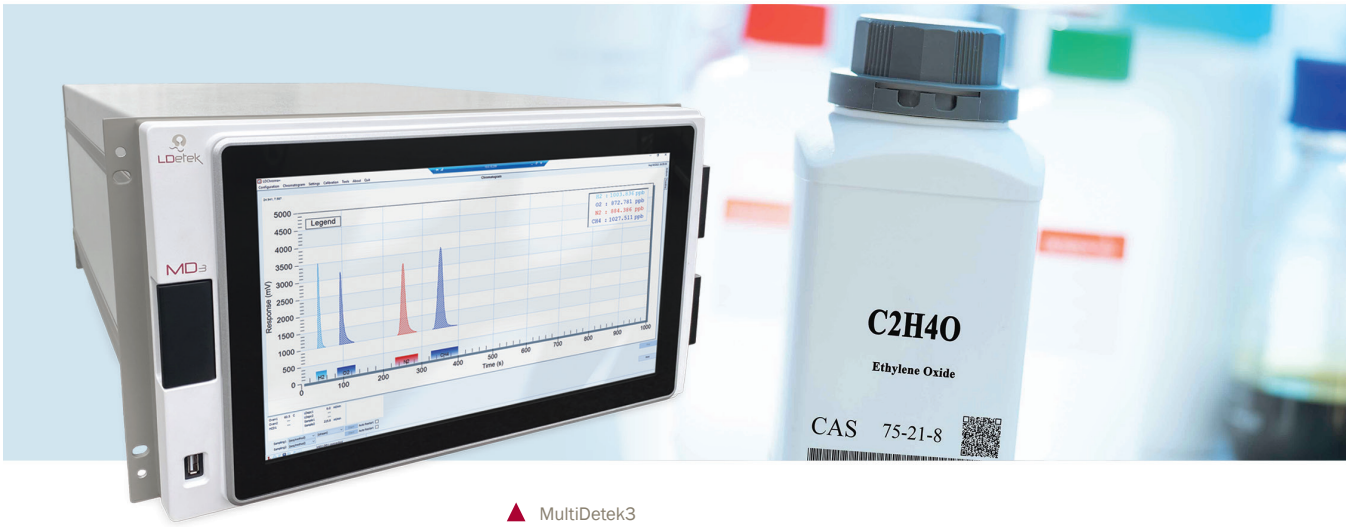
APPLICATION NOTE
LD23-08

Analysis of trace ethylene oxide
for indoor industrial air quality monitoring



▲ MultiDetek3

Ethylene oxide (EtO) is used in applications such as medical equipment sterilization and chemical manufacturing. As a known carcinogen and air pollutant, it is critical to monitor to address both emissions and workplace air monitoring. This application note shows the results obtained with the MultiDetek3 gas chromatograph for the task of ethylene oxide monitoring, enabling personal exposure measurements to ensure keep exposure within acceptable limits.

LDETEK SOLUTION

Our solution shows here the results obtain to monitor the ethylene oxide presents in the indoor air from different manufacturing applications.

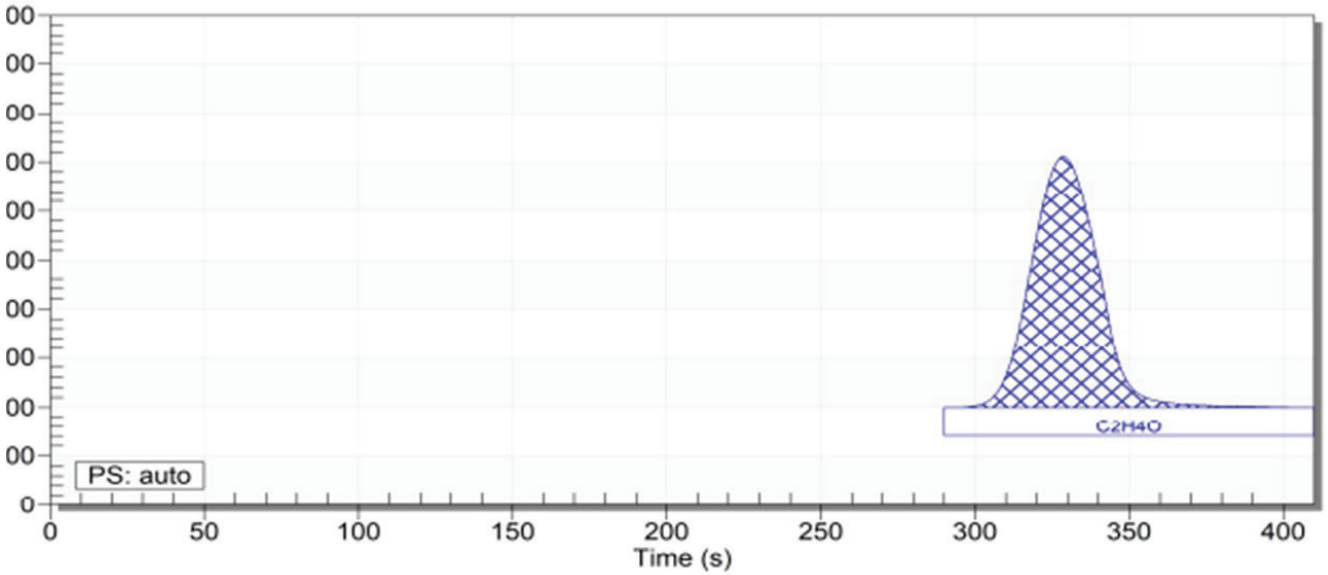
The MultiDetek3 gas chromatograph has been configured with the PED (plasma emission detector) to offer the trace analysis of ethylene oxide in indoor air. A quick analysis time of less than 6 minutes have been configured to allow the monitoring of multiple sampling point with the same instrument. The instrument is configured with 2 valves/2 columns keeping its configuration very robust and simple. Having the ethylene oxide measured by the proper gas chromatography configuration makes this analytical solution being interference free from other air contaminants and moisture what is very important in different industrial applications.

A measuring range of 0-50ppm with Idl set at 5ppb has been configured. Other ranges and Idl are possible.

The MultiDetek3 has been configured with an internal sampling system and a sampling pump that allow to switch across multiple indoor measuring points at ambient pressure. Proper purging of the lines is also adjusted depending of the length of it to ensure accurate analysis.

RESULTS

Chromatogram (Span calibration) of trace impurity ethylene oxide (C2H4O) in air.



Peak	Unit	Calibration Value	_Area Counts
C2H4O	ppm	50.00	22921

Limit of detection (based on 3 times the noise level from a blank)

COMPONENTS	CONCENTRATION (ppm)	PEAK HEIGHT	NOISE	LDL (3X NOISE)
C2H4O	50.0	2550mV	0.1mV	5ppb

Note: other LDL could be obtained with different injection volume and chromatographic condition.

Repeatability: Based on the GC standards. Using 6 of 10 consecutive runs, being lower than 5% of 3*CV%.

Linearity: Based on the GC standards. A linear curve having its R2 at a value between 0.998 and 1.00.

Accuracy: Based on the GC standards. <= 1% of error or ldl whichever is higher.

CONCLUSION

Indoor analysis of ppb/ppm ethylene oxide can be realized using the robust and interference free gas analysis solution MultiDetek3. The instrument is configured with a simple configuration which allows a quick analysis time. The analyzer comes with all the communication protocols like the 4-20mA/serial/modbus ports and is also equipped with a proper sampling system for switching between the different indoor sampling points.

LDetek
A PST BRAND
990 Monfette Est, Thetford Mines, (Qc), Canada, G6G 7K6
Phone: 418 755-1319 • Fax: 418 755-1329 • **info@ldetek.com**
www.ldetek.com