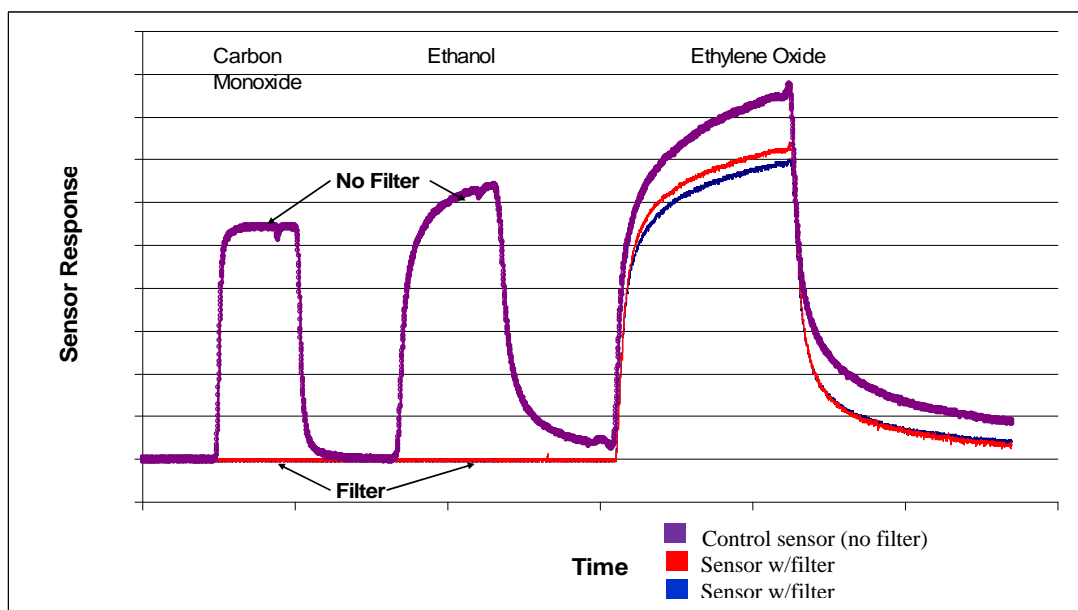


## Ethylene Oxide Spot-On<sup>®</sup> Chemical Filter

ChemDAQ has solved the long standing problem in the sterilization world of cross sensitivity in ethylene oxide gas monitors.

Ethylene oxide (ETO) efficiently kills bacteria and viruses but this same biocidal efficiency translates to great toxicity in humans, resulting in an OSHA permissible exposure limit (PEL) of only 1 ppm over 8 Hr. TWA. To safeguard workers who use ETO, continuous monitors have been developed and are sold by companies such as ChemDAQ, Inc. The great sensitivity needed to detect ETO below the PEL requires the use of electrochemical gas sensors, which can also respond to alcohols such as ethanol and isopropanol, two compounds which find ubiquitous use in health care facilities. In addition, trace levels of carbon monoxide (CO), well below its toxicity threshold can also lead to false alarms.

Until recently, users had to live with the false alarms generated by alcohols or CO that could not be remediated by changing work practices. While reducing exposure of ETO monitors to alcohols should still be minimized through careful work practice, the cross sensitivity problem has been greatly improved.



**Figure 1: Cross sensitivity testing of a filter with carbon monoxide, ethanol and ethylene oxide, each 10 ppm in nitrogen.**

Chemical filters are normally made to remove a more reactive chemical from the air and allow less active ones to pass through. The challenge here is that ETO is a highly reactive chemical and ethanol though it is flammable, is much less active. ChemDAQ's patented technology (US 7,491,547 B1) consists of a chemical filter that is incorporated into the sensor. The breakthrough was the development of a chemical filter that will remove the ethanol by selective oxidation but still let ETO pass through. ChemDAQ's chemical filter is placed in front of the sensor and since only the ETO passes through and the alcohols and CO are removed by the filter, the sensor only 'sees' the ETO.

The results shown above were obtained by an independent testing laboratory who evaluated chemical filters. Figure 1 shows the response of three sensors, two with a filter and the other, a control, without a filter. The sensors were exposed sequentially to carbon monoxide (50 ppm CO), ethanol (10 ppm ethanol) and ethylene oxide (10 ppm ETO) with inert gas (nitrogen) applied between exposures. As Figure 1 shows, the control sensor (no filter) responded to all of the test gases, but the filtered sensors only saw ETO (carbon monoxide and ethanol were effectively removed). All sensors gave almost identical responses to the ETO showing that the filters had little effect on the ETO response.

This filter design has been extensively tested to ensure their reliability under conditions that monitors are likely to be exposed to. The filters were tested from -20 to + 50 °C (the temperature limits of the sensors) and at high and low humidity. The filters passed with flying colors and the filter capacity was determined to ensure optimum performance.

We at ChemDAQ believe that use of this filter technology will clearly differentiate those health care facilities with interference problems from those that do not.