

HOW TO MEASURE STYRENE ON A CIPP JOBSITE **PART 2**

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In our first article on this subject, the focus was on the use of the **photoionization detector** (PID) when sampling styrene levels in the air on CIPP job sites. In this article, we focus on several other techniques that can assist CIPP companies in conducting styrene measurement for area samples as well as conducting employee sampling.

Since there is a robust focus on using PIDs, a quick review is in order. When using the PID keep in mind that it is a broad-band sensor that measures a wide variety of volatile organic compounds (VOCs). The PID operates by using a pump that pulls air across an ultraviolet lamp. The current is measured, and a concentration in ppm is displayed. The end user can get a quick reading but must remember that the instrument is not very selective and therefore cannot differentiate levels of VOC mixtures.

Another device that can be used in the field to take area samples is the **colorimetric detector tube**. This technique is a portable gas detection system that is lightweight, cost-effective and typically can provide an immediate detection and result of a vapor that is present in the workplace. Basic operation involves a glass colorimetric detector tube that is broken off on each end and is used with a hand pump to draw a sample of air into the tube. The glass-graduated detector tube is filled with a chemical reagent that produces a color change when exposed to the vapor that is being sampled.

Colorimetric tube technology has been available for many years to sample specific gases and vapors in an area. The goal of the colorimetric tube is to provide a means of quantifying a specific vapor or air contaminant with a reasonable degree of selectivity. This is a monitoring method that can help support the lack of selectivity present with the PID. However, the user should pay close attention

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to the accuracy specifications of the detector tubes in use. An average tube may have an accuracy specification of +/- 25% on a given reading. In addition, to assure optimum accuracy of the detector tube, the user should also pay close attention to detector tube storage guidelines as this can affect the tube's ability to function.

When the employer wants to focus on employee styrene exposure, there are several monitoring techniques that can be employed. Considered one of the simplest techniques available, the **organic vapor diffusion monitor** (OVM) is a good choice. There are a variety of OVMs on the market, and the basic design uses a single charcoal adsorbent layer that adsorbs VOCs present during the monitoring process. Once the monitoring period is complete, the monitor is sealed and shipped to an independent laboratory where the carbon layer is digested and analyzed in a laboratory using gas chromatography (GC) and mass spectrometer (MS) instrumentation. This results in a laboratory report that provides the level of VOCs collected during that sample period.

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Before initiating an employee sampling plan, it is recommended that the employer outline the objectives. For example, is the employer wanting to evaluate worker exposure levels, conduct long-term environmental monitoring, evaluate potential high exposure periods during the workday, evaluate potential effectiveness of control methods such as ventilation, or ensure that all worker exposure levels are below OSHA PELs or other government guidelines. Once the purpose and objectives have been identified, the study can be designed and executed.

There are a few things to keep in mind when using the OVM. Sampling a full work shift is recommended in order to best determine the daily exposure that a worker may have to an organic vapor. However, there may be times when sampling less than a full work shift is required so that the recommended capacity of the OVM is not exceeded. If this occurs, it is recommended that OVMs are used sequentially to access the full work shift exposure. Also, the user must keep in mind that inaccurate results can be obtained if the device is not used within its operating parameters. It is always recommended to consult the sampling device limitations and conditions prior to use.

In summary, for area sampling on CIPP jobsites the PID and the colorimetric tube kit are excellent choices. Each device has its positives and negatives that the end user must take time to become familiar with before using for field sampling. In regard to collecting employee samples, the OVM is a good choice as well. It is always recommended that whether conducting area sampling or employee sampling that a hazard assessment be completed along with a detailed sampling plan.

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