

## WORKER EXPOSURE LEVELS TO STYRENE

The Styrene Industry, represented by the CFA, ICPA, SPI, NMMA and SIRC signed an agreement with OSHA in March, 1996 which lowers worker exposure levels to Styrene from 100 ppm to *50 ppm on an 8-hour Time Weighted Average as of July 1, 1997*. This voluntary compliance program, as well as other information on Styrene that OSHA has compiled, can be located at [www.osha.gov/SLTC/styrene/index.html](http://www.osha.gov/SLTC/styrene/index.html).

OSHA had attempted to lower the Permissible Exposure Levels (PEL) down to 50 ppm back in 1989. At that time, respirators were not allowed as a control measure except in certain circumstances. In this agreement, there are no restrictions on how the levels are to be met -- but no facility may expose workers to more than 50 ppm during an 8-hour shift nor 100 ppm during a 15-minute peak period.

There are basically three means to achieve 50 ppm. They are:

- **Pollution Prevention.** Reduce styrene emissions whenever possible by, for example, using lower styrenated resins, covering containers, reducing overspray, reducing air pressure, increasing worker training, changing processes and substituting products.
- **Plant Ventilation.** For each pound of styrene in the air, 76,000 cubic feet of air is required to dilute the concentration to 50 ppm. In designing direct flow methods of ventilation, make-up air systems should push the air across the work area to the exhaust systems which should be below the worker's breathing zone. It is important to remember that styrene vapors are heavier than air. The worker should be positioned as much as possible so that he is upwind of the part he is working on.
- **Respirators.** Organic vapor cartridge respirators are the last resort for reaching 50 ppm. *Dust and mist respirators are not acceptable for reducing styrene exposure levels.* They are to be used to reduce or eliminate the odor once 50 ppm has been achieved. A proper respirator program must be established. (See respiratory protection section in the manual.)

Although styrene is of major concern in this industry, employers are responsible for ensuring that all permissible exposure limits of different air contaminants are met.

**Walk-through:** An audit of the workplace should be made.

- look at what chemicals are being used where and check the MSDS's for permissible exposure limits
- make a flow-chart of the different manufacturing steps involved in the facility
- analyze which workers are exposed to which processes and chemicals

**Monitoring** should be taken at each step of the process to ensure compliance.

- grab samples should be taken to identify any problem areas. Direct read tubes are available for many substances
- 8-hour personal sampling should be taken in questionable areas. Personal sampling badges are the easiest to use
- monitor at least four times a year for a baseline. Thereafter, annual monitoring should suffice

**Document** when, where, how and who was monitored. These records are considered exposure records, that is, medical records, and must be handled accordingly. If workers are exposed to more than the permissible exposure limit, they must be informed of the fact and it must be explained to them what is being done to lower the contaminants down to acceptable levels.

***Both sampling badges and direct read tubes as well as respirators and masks are available through the Composites One Accessories & Equipment Catalog. Call 800/348-7503 or the Composites One's Department of Health, Safety & Environment at 800/621-8003 for more information.***