

What Every Employee Should Know About Polyvinyl Chloride

In the fall of 1974, the United States Occupational Safety and Health Administration -- better known as OSHA -- set new rules to protect workers from excessive exposure to vinyl chloride monomer (VCM), a chemical gas used in the manufacture of polyvinyl chloride (PVC) resin.

As an employee in a plant that fabricates PVC resin into finished plastic products, some of these new safety rules apply to you and your employer, even though VCM itself is not used in PVC fabricating plants.

The purpose of this pamphlet is to acquaint you with the new rules and with the responsibilities jointly shared with your employer.

Why are there new rules?

In early 1974, a small number of workers exposed for many years to large amounts of VCM gas were found to have developed a rare cancer of the liver called angiosarcoma. There is also some evidence that breathing too much VCM may cause other types of illness. Of the confirmed U.S. cases of angiosarcoma to date, none have been attributed to VCM exposure among workers employed in PVC fabricating plants, although two unconfirmed cases are being investigated. All confirmed VCM related cases have been among workers in plants that either manufacture vinyl chloride monomer or else convert VCM into PVC resin through a process called polymerization. Nevertheless, the new rules will cover PVC fabrication workers in most situations.

Why do these rules apply to you?

Most PVC resins contain small quantities or residues of vinyl chloride monomer because the process for converting VCM into PVC is not quite complete and some monomer from the polymerization process itself usually remains in the finished resin.

It is this small amount of unconverted vinyl chloride monomer that needs to be controlled, not the PVC resin itself. The manufacturers of PVC resin are working hard to reduce the free monomer in their products. But, because this small amount of monomer residue exists, certain precautions are now being taken to protect those persons handling or using PVC resin and compounds.

Is the amount of monomer in PVC resin hazardous?

Studies in PVC fabricating plants indicate that the amount of VCM gas to which most fabricating employees are exposed is much less than that suspected of causing disease among workers in the resin manufacturing industry. This is partly because modern ventilation systems are capable of keeping VCM concentrations low in the fabricating industry.

To be on the safe side, however, OSHA ruled that employees in fabricating plants should not be exposed to more than an average of one part per million (ppm) of vinyl chloride monomer in the air as measured over an eight-hour working day. The highest exposure allowed is five ppm of VCM for any 15 minute period, as long as the daily average still does not exceed one ppm.

Exposure to vinyl chloride monomer in most PVC fabricating plants is already below the new OSHA limits, but in some plants improved controls may be necessary.

What do the regulations say?

In addition to the exposure limits already mentioned, the new regulations contain a number of other sections of interest to you:

1. To find out if VCM in plant air is within the limits allowed, your employer is required to undertake a monitoring program to measure the amount of VCM in the air. You are entitled to know the results of this monitoring.
2. The regulations establish a so-called "action level" of 0.5 parts per million -- one-half of the permitted level. If exposure is below the "action level" your employer is not required to continue monitoring the air unless there is reason to believe that exposure has increased.
3. If exposure is greater than the "action level" but is no more than one ppm, your employer must then monitor the air at least four times a year to make sure that possible exposure has not risen.

For all employees exposed above the "action level," your employer must establish a medical examination program to check for the effects of excess VCM inhalation. For employees in the PVC fabricating industry, these physical exams must be conducted once a year. They are, of course, free to the employee.

4. If the level is greater than one ppm, your employer must do a number of things. First, he must immediately take the necessary steps to reduce the exposure to or below the permissible limit.

Second, he must monitor the air at least monthly until the exposure is reduced to one ppm or below. Third, he must provide employees with suitable respiratory protective equipment until the level is reduced.

At exposure less than 25 ppm, until April 1, 1976, you as an employee can decide whether or not you want to wear the respiratory equipment provided to you by your employer. After that date, however, if the level is above one ppm, you must wear it. Your employer must also, of course, instruct you and your fellow employees in the proper use of any respiratory protective equipment.

5. Any area of the plant where the exposure level is above the one ppm limit will be called a "regulated area." Warning signs will be posted there and only authorized employees will be permitted into these "regulated areas."

While the full set of regulations published by OSHA contains many more requirements, most of these refer to situations unlikely to occur in PVC fabricating plants. Just the same, your employer must have a complete copy of the regulations, and you are encouraged to read it.

What can you do to help?

Industrial safety and health can never be the responsibility of only one person. You, the employee, must work with your employer to provide a safe and healthful working environment.

In most fabricating plants, exposures to vinyl chloride monomer will not exceed the "action level." In those that do, few will be in excess of the permissible level. If you work in any of these areas, it is essential that you follow the work practices that your employer will have to set up to comply with the new OSHA regulations. As with all other safety rules, never take shortcuts that may endanger your health.

Points to remember

- The exposure of employees in most PVC fabricating plants is most likely lower than the very strict limits set by the government.
- Only a small amount of free monomer is contained in the resins used in the PVC fabricating industry and efforts are being made to reduce this even further.
- The OSHA standards are extremely complicated, and have but one purpose -- employee protection from adverse health effects of vinyl chloride monomer.
- Observe all safety rules, especially these new rules, because a healthful environment for employees requires the team effort of industry and labor working together to solve mutual problems.