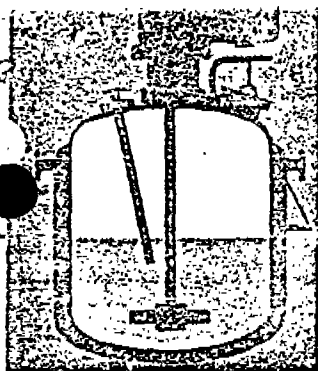


THE TRAVELERS ENGINEERING DIVISION

CHEMICAL REACTIONS



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VINYL CHLORIDE PROTECTION

Several industrial workers who were, for many years, exposed to vinyl chloride monomer have died of a rare liver cancer (angiosarcoma). As a result of these deaths, NIOSH and OSHA cooperated in an investigation and study of the problem. The old exposure level of 500 ppm was temporarily reduced to 50 ppm, and ultimately the attached standard was developed.

Vinyl chloride monomer, the basic raw material in the manufacture of polyvinyl chloride, is the agent of concern. Once the monomer has been polymerized into the final plastic resin product, the hazard is greatly reduced. The monomer, at normal temperatures and pressures, is a highly flammable and reactive gas. The greatest potential for exposure to workers is in the reaction process to produce the monomer, and in the polymerization process to produce the polymer.

Polyvinyl chloride, a white or colorless granule, is tasteless, odorless, nontoxic, and combustible but self-extinguishing. It is easily colored and compounded into rigid and flexible forms and readily lends itself to blow molding, extrusion and calendering. It is in this phase of working and heating the polymer that the absorbed and unreacted monomer may be released. These processes, therefore, offer a limited exposure to workers, because small quantities of monomer are available for release. The Standards for exposure to vinyl chloride includes all such operations for monitoring and control. The handling and use of all fabricated polymer products do not offer any exposure problems and are excluded from the Standard. Such fabricated product operations include meat wrapping, making shoe soles, upholstering, and other operations involving vinyl sheeting.

STANDARDS FOR EXPOSURE TO VINYL CHLORIDE

Part 1910 - Title 29 CFR deals with the protection of the worker exposed to vinyl chloride. The Department of Labor has conducted hearings and considered comments from all interested parties. From these hearings, changes have been made in the temporary standard and have now become law.

Effective January 1, 1975, Para. 1910.93q will be amended as follows:

1. The standard will apply to the manufacturing, reaction, packaging, repackaging, storing, handling, or use of vinyl chloride or polyvinyl chloride but it will not apply to the use of fabricated products.
2. No employee may be exposed to direct contact with liquid vinyl chloride, or to airborne concentrations greater than 1 ppm (permissible level) averaged over any 8 hour period, or to any airborne concentrations greater than 5 ppm averaged over any period not exceeding 15 minutes.

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3. An action level of 0.5 ppm averaged over an 8 hour work day has been set. A monitoring program is required to determine if there is any employee exposed in excess of the action level. The monitoring program shall be repeated monthly when any employee is exposed in excess of the permissible exposure and quarterly when any employee is exposed in excess of the action level. The program may be discontinued when two consecutive monitoring determinations made, not less than 5 working days apart, are at or below the action level.
4. The monitoring procedures must be repeated if it is believed action levels will be exceeded for any reason.
5. Areas where vinyl chloride may be in excess of permissible levels must be regulated so that only authorized persons may enter. A daily roster must be maintained.
6. Engineering and work practice controls must be used to maintain levels to at, or below permissible exposure limits. If such controls do not effectively reduce the levels, action still must be taken to reduce them as low as possible and shall be supplemented by respiratory protection.
7. Respirators must be approved by the Mining Enforcement and Safety Administration for the specific levels to be encountered. As of January 1, 1975 their use by the employee is mandatory for all levels in excess of 25 ppm but their use, by the employee, is optional until December 31, 1975 for levels below 25 ppm.
8. Special protective equipment and written operational plans are required for hazardous operations such as vessel entry or use of vinyl chloride as a liquid or compressed gas.
9. Each employee, engaged in vinyl chloride operations, shall be trained in the hazards and safe use of vinyl chloride. This will include health hazards, permissible levels, protective equipment, monitoring programs, medical programs, and emergency procedures.
10. A medical surveillance program shall be instituted to include a general physical examination with specific attention to detecting enlargement of the liver, spleen or kidneys, or dysfunction in these organs, and for abnormalities in the skin, connective tissue and pulmonary system.
11. Entrances to regulated areas require posting of warning signs which vary with the type of operation but generally follow the format: "Vinyl Chloride - Cancer Suspect Area."
12. Monitoring and measuring records, medical records, and personnel rosters must be maintained for 30 years. This information must be made available to the employee and for inspection by OSHA representatives.

The above requirements have been condensed from the Federal Register to assist those who may have vinyl chloride exposure in the workplace. For specifics, consult Para. 1910.93Q of the Occupational Safety and Health Act.