



INTER-ORGANIZATION MEMO

Inte "Training Programs"

*TECH
Service*

TO: CHEMICAL/PLASTICS

ATTENTION: *✓* R. W. Laundrie

FROM: J. T. Harrington

DATE: December 30, 1974

SUBJECT: TRAINING PROGRAM RELATING
TO EXPOSURE TO VINYL CHLORIDE
AT THE TECHNICAL CENTER

CC: J. M. Gyenge
R. L. Johnson

Attached is a copy of our proposed training program relating to exposure to vinyl chloride at the Technical Center. In accordance with our telephone conversation on 12-18-74, we will not start the training program until we receive further instructions from you. If you have any comments regarding the attached training program, please feel free to contact me.

J T Harrington
J. T. Harrington

smk

Attachment

GENC 20686

TRAINING PROGRAM RELATING TO EXPOSURE
TO VINYL CHLORIDE AT TECHNICAL CENTER

1. Define vinyl chloride.
 - a. Vinyl chloride refers to the monomer only.
 - b. Vinyl chloride is a chlorinated hydrocarbon.
 - c. Vinyl chloride is a gas at normal temperatures and pressures.
 - d. Vinyl chloride is highly volatile and extremely flammable.
2. Define polyvinyl chloride or PVC.
 - a. PVC is a polymer of vinyl chloride.
 - b. PVC is a white powder.
 - c. PVC contains varying trace amounts of vinyl chloride monomer.
 - d. Overheating PVC resins results in the liberation of H Cl mainly, rather than vinyl chloride monomer.
3. Are both vinyl chloride and polyvinyl chloride hazardous to health?
 - a. Only vinyl chloride is hazardous to health.
 - b. Vinyl chloride has resulted in angiosarcoma of the liver.
4. What jobs in the Technical Center could potentially expose one to vinyl chloride?
 - a. Open containers of PVC or PVC containing resin such as Esklor.
 - b. Mass melting of PVC containing polymers during extrusion and milling, etc.
 - c. Mixing of powdered resins in various mixing equipment.
 - d. Leaving PVC containers open.
 - e. Spillage of PVC containing polymers.
5. What steps are being taken to eliminate exposure to vinyl chloride?
 - a. Fabrication of new exhaust cowls.
 - b. Installation of dampers to increase exhausting in areas that are being used.
 - c. Improved housekeeping.
 - d. Ashtabula constantly reducing residual VCl levels in PVC resin.

GENC 20887

- e. Emergency procedures.
- f. Respiratory protection.
- 6. Respiratory equipment.
 - a. Purpose.
 - b. Types.
 - c. Limitation.
 - d. Sanitation.
 - e. Health hazards - need doctor's approval.
 - f. Show how to use.
 - g. Designate rescue team.
- 7. What are the fire hazards of vinyl chloride?
 - a. Extremely combustible.
 - b. Explosive limits: 4 - 22% (% by volume).
 - c. Highly unlikely that there would be sufficient vinyl chloride in area. We do not work with pure vinyl chloride.
 - d. Acute toxicity of vinyl chloride - nausea, dizziness, lack of coordination, headaches.
- 8. What are the fire hazards of polyvinyl chloride?
 - a. PVC is self-extinguishing.
 - b. When PVC burns, H Cl is culprit, not VC.
- 9. Monitoring and measuring.
 - a. Purpose - safety of employees.
 - b. Goal - Exposures below 0.5 ppm TWA (8 hours). This allows an area to become a non-regulated area.
 - c. Types of monitoring:
 - 1) Personal - employee wears pump and performs normal functions in lab.
 - 2) Area - pump is positioned at one area only.
 - d. Method of sampling: Sipin pump with carbon tube.
 - e. Results to date: All samples below 0.5 ppm TWA (8 hours).

10. Medical Surveillance.

- a. Non-specificity of tests for cancer. Only sure method still for internal cancers is a biopsy.
- b. Our program.
 - 1) Medical history.
 - 2) Physical exam.
 - 3) Pulmonary tests.
 - 4) Urine tests.
 - 5) Blood - whole and serum tests.
 - 6) Biopsy when indicated.
- c. Not required when exposures are below 0.5 ppm TWA (8 hours).
- d. Where required, must be repeated every 6 months for employees with exposure for ten years. All others on an annual basis.

11. Emergency procedures.

- a. Who does what, when something happens.
- b. Procedure for overheated batches - Use self-contained breathing apparatus for removal of scorched material. Evacuate rest of people in area until fumes clear.
- c. Consult Sales-Service Safety Manual.

TRAINING REQUIREMENTS OF STANDARD
ON EXPOSURE TO VINYL CHLORIDE

Discussed, Read and Understood (Initials) (Date)

Various Bulletins	J. T. Harrington	J. M. Gyenge	T. B. Pinson	H. G. Schmidt	J. Brown
"Vinyl Chloride Monomer in PVC," GTR Chemical Division Brochure, 11/74					
"Conformance with the Training Requirements at 1910.93 (q) (j) of Standard on Exposure to Vinyl Chloride," General Tire Memorandum, 11-27-74					
"Properties and Essential Information for Safe Handling and Use of Vinyl Chloride," 1954 MCA					
Part 1910.93q - Occupational Safety and Health Standards					
Sales Service Safety Manual, 10-11-71 (Revised 12-18-74)					

GENC 20689.01

File "Training Program"

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DEC 23 1974

D. H. Markusson

Ashtabula

J. R. Mudd

December 19, 1974

Employee Training

Attached is the first draft of the training program that we intend to institute at Ashtabula in order to comply with the new standard.

Please review and give comments so that your recommendations can be included in final issue.

J. R. Mudd
Plant Manager

JRM/ikb

cc: R. W. Laundrie ✓

GENC 20690

EMPLOYEE TRAINING PROGRAM
VINYL CHLORIDE MONOMER

*Start new Tele
Training Program VC
Reading ~~Reading~~
~~Columbus~~*

I. The Nature of the Health Hazard

Vinyl Chloride is a gas made from either acetylene or ethylene and chlorine. This gas is converted (polymerized) by various processes to a white powdered solid called polyvinyl chloride resin. We use this resin in calendering and plastisol casting to manufacture vinyl coated fabrics and films.

During the conversion of the gas to the white powder, polyvinyl chloride, small amounts of the gas, called monomer, are not converted and are carried along with the resin to the succeeding operation which is calendering or plastisol mixing. Due to continued mixing, there is a release of most of the remaining gas to the air. It has been believed for years that this gas had a moderate effect on the liver, and, therefore, a limit had been established of 500 ppm. This is equivalent, using the same analogy as we have used in the past, of adding about five ^{ounces} ~~gallons~~ of vermouth to the tank car of gin to make a martini.

In January of 1974 several deaths were reported by B.F. Goodrich Chemical Company. These deaths were attributed to a rare liver cancer -- angiosarcoma.

Hearings were held in February of 1974 and additional medical evidence was presented, leading to the conclusion that Vinyl Chloride Monomer was the cause of the liver cancer observed.

An emergency temporary standard was established at 50 parts per million in April of 1974, a substantial reduction from the 500 ppm standard. The new standard was recognized as being tentative, until additional

information could be brought to light, based on laboratory tests and experiments underway at the time.

Based on these new results, and after hearings held in Washington in June on a new permanent standard proposal, the present regulation was issued on October 1, 1974.

The testimony was extensive, based on animal laboratory testing data by independent laboratories and confirmed cases of liver angiosarcoma in exposed employees. These employees worked at plants manufacturing the white powdered resin, not at plants like ours, where the resin is changed to a coated fabric. (This sentence should be substantiated before using in the training program.)

I-b. Specific Nature of Operations Which Could Result in Exposure to Vinyl Chloride
(in excess of the permissible limit)

As we receive the white powdered resin in our plant in two methods, by tank car and bags there are, therefore, only several areas where exposure to the gas is possible. We can eliminate one immediately, because all of our extensive testing, and testing by other plants and other companies in our industry show that resin received in bags for plastisol makeup, in the Dope Room, is below the permissible exposure limit. We have also not recorded any readings above the exposure limit where calender resin is received in bags for usage at #10 Calender.

The receiving of resin in tank cars, and the storage in silos out at #11 Calender has, in the past few months resulted in readings in several areas that are considered to be above the exposure limit if a man worked in these areas constantly. These are on the platforms of the preblenders, 2nd and 3rd floors of #11 Calender. In accordance with established test

procedures, sampling analysis of exposure of individuals working on this equipment is below the permissible exposure limit. This is because no employee is required or needed to work in these two areas for any length of time greater than 5 to 10 minutes per hour.

In addition to the lack of exposure, engineering changes through better resin handling, and increased ventilation, have reduced the exposure below the level required to meet the new standard.

I-c. Respiratory Protective Devices

This plant does not have any areas requiring the use of respiratory devices for employees, and we cannot foresee that such devices will ever be necessary. However, if for some reason such devices were needed, they would be provided for each employee to insure maximum protection against the inhalation of vinyl chloride gas.

I-d. Fire Hazards and Acute Toxicity of Vinyl Chloride

This does not apply to this plant. We had one maximum reading of about 6 parts per million -- a fire hazard has been established as a level of 36,000 parts per million or 6 thousand times greater than our one maximum reading. Acute Toxicity exposure (one time exposure over 500 parts per million) does not apply to this plant. However, if you were exposed at some other location, you might experience dizziness and nausea.

I-e. Purpose and Description of the Monitoring Program

In order to absolutely insure the health and safety of all our employees, an extensive and expensive program has been underway to carefully measure the degree of exposure to vinyl chloride of each employee. All of you have seen air samples being taken frequently in areas where

any chloride gas might possibly be present. In addition, some of you have been wearing small pumping devices which will measure your continuous exposure to vinyl chloride gas over an extended period of time during your working day.

As we have accumulated these data going back to last summer, we have substantial and convincing evidence that our plant does not have any hazardous areas requiring regulation of the employees' exposure. Regulation of exposure means that a particular area of the plant would be restricted from full employee use, signs would have to be posted, and a daily record of authorized employees who enter the area must be kept.

I-f. Purpose and Description of the Medical Surveillance Program

Again, this program does not apply to the Reading Plant, since we do not have an area where exposure to vinyl chloride is a hazard. If for any reason you left our employment, and were employed in a plant where exposures are over the so-called action level, you would be entitled to an examination by or under the supervision of a licensed physician without cost to you. This medical examination would be conducted at the time of your initial employment and annually thereafter.

The examination would be very detailed and would provide a complete statement concerning the employees' suitability for continued exposure to vinyl chloride and his need to wear protective equipment.

If an employee's health would be materially impaired by continued exposure, he or she would be withdrawn from possible contact with vinyl chloride.

I-g. Emergency Procedures

Emergencies apply to plants handling, or otherwise using, vinyl chloride as a liquid or compressed gas. These materials are not used in Reading operations. If they were, suitable protective garments and the necessary respiratory devices would be provided, and a written operational plan would be developed to handle the emergency.

I-h. Information to Aid Employees in Recognizing Conditions Which May Result in Release of Vinyl Chloride

All areas in our plant where polyvinyl chloride resin powder (not the gas) is stored or used will have precautionary signs in yellow letters on a black background.

These signs will start to appear on bags, tank cars, silos, weigh hoppers, etc. and state the following:

"POLYVINYL CHLORIDE CONTAINS VINYL CHLORIDE"

"Vinyl Chloride is a Cancer Suspect Agent"

Note these signs will start to appear on bags -- our exhaustive testing show that bags of powdered resin are well below the exposure limit. Tank cars and silos are not, but are totally enclosed. If for any reason, it is necessary to open a silo or tank car, only employees suitably trained in such procedures shall be permitted to perform this operation.

At higher levels than exist at Reading -- much higher -- the gas becomes detectable by smell. As stated earlier, a one time exposure to 500 parts per million might lead to dizziness and nausea.

I-i. Review of Federal Standard

Each employee will have a review of the Federal Standard as noted in the above paragraphs during his first training and indoctrination program and annually thereafter.