

VINYL CHLORIDE ANNUALTRAINING SESSION

The Occupational Safety and Health Administration act 29CFR 1910.1017 requires employees working with vinyl chloride or polyvinyl chloride receive annual instructions regarding the potential hazards and safe use of both products.

I. Health Hazards of Vinyl Chloride

Vinyl chloride has anesthetic properties at high concentrations and was used during the 1930's in conjunction with chloroform for experimental anesthesia work in some hospitals. Therefore, exposure to high concentrations can cause loss of consciousness and should be avoided.

Vinyl chloride is also a suspect carcinogen (could cause cancer) related to angiosarcoma (liver cancer) and acro-osteolyses (degeneration of finger bones) at lower concentrations. There are also indications of other possible disorders related to vinyl chloride exposure that have surfaced from animal studies. These implications have led the government to establish a standard of 1.0ppm vinyl chloride averaged over eight hours with a 15 minute 5ppm excursion.

II. Tasks which could result in +1.0ppm exposure and require the use of respiratory equipment

A. PVC Latex

1. Airline mask while cleaning PVC Latex reactors.
2. Airline mask while sampling PVC Latex from on-line reactors.

Vinyl Chloride Annual Training Session (continued)

II. B. PVC Resin

1. Airline mask while cleaning PVC resin reactors.
2. Airline mask for unloading monomer cars while connecting or disconnecting piping and other monomer-carrying equipment.
3. Airline mask while sampling VCM from railroad cars, tanks, or lines.
4. Airline mask while approaching a suspected random leak or other unusual sources.
5. Airline or canister mask while approaching within 10 feet of maintenance work listed in Section E not isolated by enclosure or temporary curtain.

C. PVC Control Laboratory

1. Canister mask while sampling, handling, or analyzing samples of VCM monomer.
2. Canister mask while handling wet cake or PVC slurry samples.

D. Development Laboratories and Pilot Plants

1. Airline mask while filling and connecting VCM cylinders.
2. Airline mask while handling fresh slurry or PVC Latex.
3. Airline mask while cleaning reactors.
4. Airline mask while sampling on-line reactors.

E. Maintenance

Airline masks will be worn by maintenance men when opening up the following monomer-bearing equipment. The masks will continue to be worn until the opened equipment has been proven by a suitable VCM detecting instrument not to be emitting excessive VCM

Vinyl Chloride Annual Training Session (continued)

II. E. Maintenance (continued)

in the normal breathing area of the mechanic.

1. Reactor connections, such as, step bearings, rupture discs, valves next to reactor, sight or light glasses.
2. Recovery system vessels.
3. Recovery compressors or vacuum pumps.
4. Monomer & recovery seal water filters.
5. RVCN meters.
6. Recovery system condensers.
7. VCM & RVCN lines.

★ III. Respiratory Equipment

Respiratory equipment, supplied to employees engaged in operations where exposure to vinyl chloride could exceed 1.0ppm, shall be used in the following manner.

- ★ A. Carbon canisters with full or half face piece for up to 25ppm.
- B. Continuous flow airlines with full or half face piece for up to 1000ppm and aforementioned tasks.
- C. Self-contained breathing apparatus (such as Scott Air Pak) for greater than 1000ppm or unknown concentrations.
- D. Any personnel entering vessels used in vinyl chloride or polyvinyl chloride service must use continuous flow full face piece airline respirators.

All respiratory equipment purchased for this plant must and does meet MESA, DOI, and NIOSH provisions. Air purifying canisters must be replaced at the end of the shift used or

Vinyl Chloride Annual Training Session (continued)

prior to the next shift. A continuous monitoring and alarm system shall be maintained

to alert employees of what equipment is necessary.

A. Blue Light - Canister

B. Horn - Airline (evacuation)

C. Computer - 1000ppm+ or unknown - Scott Air Pak

NOTE: 3,600ppm - 36,000 life
rescue & secure equipment
prevent further release.
+36,000 life rescue only

IV. Fire Hazard and Toxicity of Vinyl Chloride

Vinyl chloride is a highly volatile liquid and extremely flammable gas. The L.E.L. and U.E.L. are approximately 4-22%. The boiling point is +7°F and it is a gas under normal ambient conditions. Vinyl chloride is about 2.2 times as dense as air and normally seek out areas such as ditches and drains; it diffuses rapidly. To combat a vinyl chloride fire, keep surrounding structures cool with straight streams of water, until the source of the vinyl chloride can be shut off or until the fire burns out. Never prematurely extinguish a vinyl chloride fire since the possibility of an explosion then exists.

Vinyl chloride is considered toxic at continuous high levels of exposure (5-10%) resulting in loss of consciousness and subsequent kidney, spleen, lung, and arterial damage.

V. Monitoring Program

The purpose for the monitoring program is twofold. First to alert employees of when to wear the various respiratory devices through our gas chromatograph and computerized sys-

Vinyl Chloride Annual Training Session (continued)

V. Monitoring Program (continued)

tem and secondly to determine actual personal exposures through our charcoal tube and pump devices. These results are made available by the form you sign acknowledging the test data.

VI. Medical Surveillance Program

(1.) A program of physicals including some specific tests has been instituted.

(a) A general physical examination shall be performed, with specific attention to detecting enlargement of liver, spleen, or kidneys, or dysfunction in these organs, and for abnormalities in skin, connective tissues, and the pulmonary system.

(b) A medical history shall be taken, including the following topics:

1. Alcohol intake;
2. Past history of hepatitis;
3. Work history and past exposure to potential hepatotoxic agents, including drugs and chemicals;
4. Past history of blood transfusions; and
5. Past history of hospitalizations.

(c) A serum specimen shall be obtained and determinations made of:

1. Total bilirubin;
2. Alkaline phosphatase;

Vinyl Chloride Annual Training Session (continued)

VI. Medical Surveillance Program (continued)

- (c) 3. Serum glutamic oxalacetic transaminase (SGOT);
 - 4. Serum glutamic pyruvic transaminase (SGPT); and
 - 5. Gamma glutamyl transpeptidase. (GGTP)
- (2.) Examination shall be performed at least:
- (a) Every 6 months for each employee who has been exposed to vinyl chloride or polyvinyl chloride manufacturing for 10 years or longer; and
 - (b) Annually for all other employees exposed to vinyl chloride or polyvinyl chloride
- (3.) Each employee exposed to an emergency shall be afforded appropriate medical surveillance.
- (4.) A statement of each employee's suitability for continued exposure to vinyl chloride including use of protective equipment and respirators, shall be obtained from the examining physician promptly after any examination. A copy of the physicians's statement shall be provided each employee.
- (5.) If any employee's health would be materially impaired by continued exposure, such employee shall be withdrawn from possible contact with vinyl chloride.
- (6.) Persons will not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance annually). When required tests show abnormalities, the tests will be repeated as soon as practicable, preferably within 3 to 4 weeks. If tests remain abnormal, consideration will be given to withdrawal of the employee from contact

Vinyl Chloride Annual Training Session (continued)

I. Medical Surveillance Program (continued)

- (6.) with vinyl chloride, while a more comprehensive examination is made.
- (7.) Each employee shall have an eye examination which shall include tests for near vision, depth perception, color vision, and peripheral vision. These tests will be conducted at the time of employment and annually. The employee shall be notified of any deficiencies.

VII. Emergency Procedures

POLYCO

See Pages (8) and (9)

PVC

See Pages (10), (11), (12), and (13)

VIII. Exposure Recognition

In order to create an awareness, some specific examples of conditions that could lead to vinyl chloride exposure in excess of the current federal standard are included in the following list:

- 1. Improper opening of a kettle.
- 2. Improper preparation for VCM filter changing.
- 3. Failure to keep gaylord boxes or fiber drums of PVC closed in dryer or warehouse area.
- 4. Connecting and disconnecting vinyl chloride tank cars.
- 5. Improper slurry stripping practices leading to high residual VC content in PVC resin.

IX. Current Standard 1910.1017 (c)

- (1) No employee may be exposed to vinyl chloride at concentrations greater than 1.0ppm averaged over any 8 hour period, and
- (2) No employee may be exposed to vinyl chloride at concentrations greater than 5.0ppm averaged over any period not exceeding 15 minutes, and
- (3) No employee may be exposed to vinyl chloride by direct contact with vinyl chloride liquid.

VCM EMERGENCY PLAN -- POLYCO DEPARTMENTDEFINITION:

An emergency is defined as the existence of a concentration exceeding 100ppm Methyl Chloride in air resulting from a massive release from an uncontrolled source.

EQUIPMENT:

The only respiratory equipment approved for use in dealing with an emergency is the Scott Air Pak. These units are located as follows:

- 1 - Outside the Old Sample Cage Area
- 1 - Outside the Supervisor's Office
- 1 - By the PVC Reactor Control Panel
- 1 - Hallway Outside AT-4

The Safety Department should be notified anytime Scott Paks are used during hours other than Monday through Friday, 0800-1700 hours except holidays, by contacting Cecil Snyder (582-4651) or Ken Macy, II (874-2013). During regular office hours call 241, 297, or 322.

Take any used Scott Pak to the Mask Room immediately following any emergency for tank replacement. The EPA Technicians will be in the Mask Room during emergencies for tank replacement if necessary.

Used Scott Paks must be returned to their designated location as soon as the tank has been replaced.

ALERT:

The Bendix Monitoring System will sound an area alarm at 25ppm. This is a warning that a higher VCM concentration may exist. If the VCM alarm horn sounds, the PVC Latex Operator should notify the Supervisor immediately if he is not in the area. At the discretion of the Supervisor, the local alarm will be sounded.

EVACUATION:

If the local alarm is sounded, personnel are to react as follows:

- | | |
|-------------------------|---|
| CC#33 Production Helper | - Shut down equipment |
| Pilot Plant Operator | - Equipment shut down |
| PVC Latex Helper | - Close all fire doors & office isolation doors |
| Control Lab. Tech. | - Report immediately to the Polyco Lunch Room |

then report to Bldg. 23, Polyco Lunch Room (reserve center) for call by the Supervisor if needed. Keep extension 379 open for emergency communication.

ACTION TEAM:

Action Team personnel who are required to stay in the Bldg. 23 operating area, using the Scott Air Pak if a VCM emergency exists or airlines otherwise are:

- | | |
|---------------------------|---|
| Shift Supervisor | - In charge of overall emergency |
| Reactor Operators | - VCM source control or equipment shut down |
| Other Operating Personnel | - Return only at Supervisor's request |

Leominster Site
Emergency Plan - Polyco Department
Page 2

NO OTHER PERSONNEL PERMITTED TO ISSUE INSTRUCTIONS OTHER THAN SUPERVISOR ON DUTY.

SHUTDOWN:

After 15 minutes, if the emergency has not been abated, monomer feed and catalyst feed will be stopped and all reactors put on full cooling. After 15 minutes of full cooling, the soap feed will be stopped. Further directions will be by the Shift Supervisor according to the magnitude of the emergency. These directions may override the written catalyst, monomer, and feed stoppage guidelines.

"ALL-CLEAR":

The VCM concentration, if involved, will be checked and determined to be under control by the Supervisor before sounding the "All-Clear". The "All-Clear" is 4-4-4 on the call bell system. Once the Supervisor is convinced the areas are acceptable to normal activities, he will sound the "All-Clear".

MEDICAL ATTENTION:

Anyone exposed to emergency conditions involving VCM exposure will receive medical attention as soon as practical (report to medical unit as assigned by Supervisor if during normal 0800-1700 hours, Monday through Friday work week or beginning or end of next shift. Anyone coming into skin contact with liquid VCM will receive immediate medical attention.

Revised: April 20, 1980
: July 28, 1980
: Sept. 4, 1980

VCM EMERGENCY PLAN -- PVC DEPARTMENT

DEFINITION:

An emergency is defined as the existence of a concentration exceeding 100ppm vinyl chloride in air resulting from a massive release from an uncontrolled source.

EQUIPMENT:

The only respiratory equipment approved for use in dealing with an emergency is the Scott Air Pak. These units are located as follows:

- 2 - MCC No. 3-A emergency center
- 1 - Bldg. 7 Upper stairway
- 1 - Bldg. 7 Lower near stairway
- 1 - Bldg. 1-W at west stairwell
- 1 - Bldg. 1-E outside fire door
- 1 - Safety Equipment Room
- 1 - Supervisor's Office (Outside - opposite 6' dryer)
- 1 - Bldg. 31 Office (Reserve Center)
- 1 - Bldg. 10 - Semi-Pilot Plant Hallway

Any Scott Pak used for an emergency must be taken to the Mask Room so the empty tanks can be replaced with full ones, and the face pieces can be cleaned as soon as possible.

The Safety Department should be notified anytime Scott Paks are used during hours other than Monday through Friday, 0800-1700 hours except holidays, by contacting Cecil Snyder (582-4651) or Ken Macy, II (874-2013). During regular office hours, call 241, 297, or 322.

Take any used Scott Pak to the Mask Room immediately following any emergency for tank replacement. The EPA Technician will be in the Mask Room during emergencies for tank replacement if necessary.

Used Scott Paks must be returned to their designated location as soon as the tank has been replaced.

ALERT:

The Bendix monitor will sound the area alarms at 25ppm. This is a warning that a higher VCM concentration may exist. If the cause of this alarm is judged as an emergency or indication of a massive VCM release, the local alarm will be sounded.

EVACUATION PROCEDURE - PVC DEPARTMENT

1. All personnel except the Action Team must evacuate operating areas at the sounding of the Local or Fire Alarm.
 - A. Operating personnel report to Reserve Center Bldg. 31.
 - B. Maintenance personnel report to Maintenance Department Bldg. 6.
 - C. Control Lab. Technicians report to Bldg. 31.
 - D. Shipping personnel report to Bldg. 31.
 - E. PVC Plant Office personnel report to Bldg. 31.
 - F. Pilot Plant personnel (Bldg. 5) report to Bldg. 31.
 - G. All others (visitors, engineers, etc.) report to Bldg. 31.
2. Action Team - Personnel who are required to remain in the operating area.

PERSONNELRESPONSIBILITIES

A. Shift Supervisors	Overall control of emergency.
B. Procedure Supervisors	Monitor and report VCM levels. Monitor unattended reactors. Monitor evacuation of personnel. Provide assistance to Shift Supervisor.
C. Utility Kettle Operator	VCM source control. Shutdown equipment as required.
D. Kettle Operator or Pilot Plant Operator in Affected Area	VCM source control. Shutdown equipment as required.
E. Production Helper (Transferring in Bldg. 7)	Obtain key for Elm Hill Ave. vehicle gate from Supervisors Office. Close railroad gates and Elm Hill Ave. vehicle gate. Have train engine shutdown. Remain at Elm Hill Ave. gate and wait for instructions from Supervisor.
F. Shift Mechanic	Standby at Shift Maintenance Supply Room - Bldg. 1 East.
G. EPA Technician	Mask Room - Change Scott Pak Tanks.
H. Shipping Department Supervisors	Have vehicles that would obstruct Fire Department relocated and vehicles shutdown.
I. Shipper Helper	Shutdown vehicles. Proceed to guard shack and stop or relocate all incoming traffic to Polyco Parking Lot

No Other Personnel Permitted To Issue Instructions Other Than Shift Supervisor On Duty.

3. Shutdown

A. Kettle Operators/Pilot Plant Operators

Stop charging reactors and close charge valves. Stop reactor Degassing but do not enter building to stop. Isolate all reactors.

B. Helpers

Stop transfers. Shut off transfer pump(s) and close reactor discharge valves.

C. Utility Helper

Shutdown rail car unloading operation. Stop compressors or pump(s).

D. Dryer Operator

Ensure that Fire Doors between reactor and dryer areas are closed.

E. If equipment shutdown is required involving additional people, they will be directed to do so by their Shift Supervisor (including mask requirements) using the plant phone system (extension 405) to Bldg. 31.

4. Reserve Center

A. Control Lab. Technician will be a communicator for the Reserve Center. He will be informed (extension 405) by the Shift Supervisor about special needs such as Fire Department Personnel, ambulance or additional Supervisors.

B. Control Lab Technician will inform personnel at the Boiler House that an emergency condition exist in the PVC Depts.

C. Control Lab. Technician will record names of all personnel who report to the Reserve Center, Bldg. 31.

5. "ALL-CLEAR"

A. The VCM concentration will be checked in adjacent operating areas by the Supervisor before sounding the "All-Clear" signal.

B. The "All-Clear" signal is the same for all alarms (4-4-4).

C. The Supervisor shall determine that the VCM concentration is under 25 PPM before sounding the "All-Clear" signal.

D. All evacuated personnel will report to their normal job station using necessary respiratory equipment.

6. MEDICAL ATTENTION

A. Anyone exposed to emergency conditions involving VCM exposure will receive medical attention as soon as practical (report to medical unit as assigned by Supervisor if during normal 0800-1700 hours, Monday-Friday work week or

(14)

beginning or end of next shift.

- B. Anyone coming into skin contact with liquid VCM will receive immediate medical attention either at the Medical Center or Leominster Hospital.

BOR 012390