

ADVANCE COPY

QUESTIONNAIRE: VINYL CHLORIDE (VC) AND POLYVINYL CHLORIDE (PVC) FACILITIES

1. General Plant Layout:

- a. Is it an outdoor facility? 1/3 outdoor, 2/3 indoor
- b. How long has the plant been in operation? 6 years
- c. Is the equipment corroded? No
- d. Is the equipment in need of maintenance? No Specify: NA
- e. Is the housekeeping good? _____ Poor? ☒ In which aspects? ① Resin build-up in bagging + outside land areas ② Accumulation of resin + other chemicals on floor + overhead in resin blend zone.
- f. Where is the control room located? In polymerization (poly) building.
- g. Other pertinent details re general plant layout: (see attached plant layout)

ADVANCE COPY

2. Raw Materials

- a. Indicate the raw materials: (see attached raw material sheets - 4 pages)
- b. How are these handled? (see attached sheets)
- c. What provisions is made for their storage? (see attached sheets)
- Silo? _____ Tank? ☒ Car? _____
- Bags? ☒ Pressure area? _____ Other? fibers
- metal drums, cylinders
- d. What controls are enforced while these materials are in storage?
- N.A.
- e. Is entry to storage facilities accomplished with an air supplied mask? No.
- If not, how? the respiratory protection
- f. How are withdrawals of raw materials controlled? _____
- Closed system? ☒ Exhaust system? ☒
- Out of doors? ☒ Other? N.A.

ADVANCE COPY

3. Manufacturing Process

a. What process is used? polymerization of VC monomer;
compounding (pelletizing) PVC (sheet 2)

VC: Direct chlorination? N.A.

Oxychlorination? N.A.

Other? N.A.

PVC: Polymerization? suspension polymerization

Wet? ☒

Dry? N.A.

Other? N.A.

b. What is the method of recycle for the unreacted vinyl chloride?

VC monomer is recycled from stripping tank &
recycled (see PVC resin manufacturing flow diagram)

c. In what form is the finished product?

Powder? ☒

Pellets? ☒

Gas? ☐

Other? ☐

d. How is it shipped? bags, 50 lb bags (palletized)
bulk rail car, bulk truck

e. What are the container sizes? bag - 50 lb; box - 1700 lb

OCC 0629

ADVANCE COPY

4. Controls for the Containment of VC and/or Control of Reaction

a. What controls are utilized?

(see attached sheet)

Describe: _____

Are the controls arranged to fail-safe? _____

b. Are two sources of supply provided for? _____

Cooling water?

ambient temp. sewer water; refrigerated water (2 electric, 1 diesel pump)

Electricity?

2 lines, one to another power

Compressed air?

3 compressors (1 emergency diesel)

Refrigeration?

2 water chillers

Are they automatic?

yes

c. Where is the control room/area located?

Poly building

Is it at positive pressure with respect to contaminated areas?

No

Is it at least 200 feet from major VC storage or processing?

No

d. Are written control/startup/shutdown procedures available to operating personnel?

yes

OCC 0630

4. a. Controls for containment of VC and/or reaction.

(1) unloading area (from RR tank car to storage tank) - closed lines from rr car to receiving tank, vapors removed from transfer line by air jet down away from operator; rr car left with positive (10 lb) pressure.

(2) storage area - no vents, vapor compresses outdoors, closed storage

(3) transfer pipe from storage to reactor - VC pumped thru closed system equipped with spring loaded relief valves & rupture discs sensitive to overpressure

(4) reactors - control of reaction

Ⓐ pneumatic temperature controller - cooled water circulated thru reactor jacket once polymerization (exothermic reaction) begins

Ⓑ alarm system activated by high pressure

Ⓒ employee monitoring, eg, vat temp.

(5) slurry hold tanks - slurry removed from reactor via closed system to stripping vessel for relaxation of VCM, batch process

Ⓐ high-level alarm (sounded) - indicate slurry overflow, excess overflows into effluent trenches Ⓑ pressure gauge

OCC 0631

ADVANCE COPY

5. Ventilation

- a. What is the type of ventilation system? Poly bldg - exhaust fan on north side, 2ND 1ST floor, std. flow - 10 A.C./hr, entry flow - 20 A.C./hr; Druggist area - no vents, low flow rate; con-

Is it adequate?

Working area - wall fans.
Not Adequate.

- b. Where is the air exhausted? Outside

Is the air treated before exhaustion? No.

How? _____

- c. Is makeup air introduced in sufficient volume to maintain correct operation? Yes.

Where does the makeup air come from? Outside

Is it treated? No.

How? _____

Is it heated in the winter? Yes; steam heater -

chargers.

- d. Is the entry air to the control room treated? No.

How? _____

ADVANCE COPY

6. Waste Materials

a. What is the disposition of waste materials?

Process under-solids
settled, pH adjusted, then to municipal facility; solids
from clarifying process hauled away to landfill

Buried? ☒

Burned? ☐

Where? ☐

How? ☐

City dump? ☐

Other? County landfill

Describe: Cecil County Landfill, Md.

Treated? ☐

How? ☐

Specify: ☐

b. Other pertinent specifics relative waste materials:

Solids settled
out from waste water and once periodically taken
settling solids, placed on ground, and re-
moved to landfill.

ADVANCE COPY

7. Sanitation

a. What sanitation facilities are provided? _____

Shower? _____ ✓

Washroom? _____ ✓

Change room? _____ ✓

Individual lockers? _____ ✓

Lunchroom? _____ ✓

Drinking fountains? _____ ✓

Toilets? _____ ✓

b. Comment on location, accessibility, adequacy, utilization, condition, etc. of pertinent sanitation facilities: Accessible,

where when needed.

OCC 0634

ADVANCE COPY

8. Exposure to VC

a. In which activities is there a potential for exposure to VC? _____

(see attached sheet)

How many employees are involved in each activity? _____

(see attached sheet)

What is the length of the potential exposure time? _____

(see attached sheet)

b. Are the activity areas regulated? No.

Indicate which: (Sop's for all operations)

Give the rationale for establishing these: N/A.

c. Are all employees generally aware of the hazards presented by VC or PVC? Yes

To what extent is labeling or posting of signs used to appropriately inform or warn employees? Minimal

8. Exposure to VC

a. Activity	b. # of employees	c. Exposure time
① transfer of VC to storage tank from RB tank car	1	1/2 hour
② maintenance in VC storage area	1 to 10	1/2 to 8 hrs
③ charging reactor sets prior to reaction	1	7 1/2 hours
④ cleaning and maintenance of reactors		1-3 hours
⑤ filling strip- ping and slur- ry tanks	1	7 1/2 hrs
⑥ cleaning strip- ping and slur- ry tanks	1	3 hrs
⑦ centrifuging and drying	1	7 1/2 hrs
⑧ blending, com- pacting, pelletizing	1	8 hrs
⑨ shipping	1	8 hrs

ADVANCE COPY

9. Protective Clothing and Equipment*

a. What articles of protective clothing and equipment are the employees provided? safety glasses, gloves
(coveralls & leather shoes)

Are they required to wear or use these? Yes.

Do they wear or use these? Specify Yes.

b. Do employees change into work clothes upon arrival at the plant and back into street clothes before departing? Optional

c. Do they shower at the end of the day? Optional.

d. Do they wash hands and face before eating lunch? (Required
when leaving blend room)

Where do they eat lunch? canteen

f. How are clothing and equipment articles cared for? Work
clothes laundered; company pays
partial cost.

(1) How often cleaned? twice weekly

How? J.

Where? private laundry firm

(2) Are they decontaminated after use? Yes.

Which use? _____

When? _____

Where? _____

OCC 0637

ADVANCE COPY

9. Protective Clothing and Equipment*--Continued

g. How often are the articles replaced?

As needed

What determines replacement?

Poor condition

* Respiratory protection devices are covered in question 10--omit here.

OCC 0638

ADVANCE COPY

10. Respiratory Protection

a. What kind of respiratory protection devices are provided? _____

Air line respirators, self-contained
breathing apparatus, toxic dust masks

Are the respirators provided specific for protection from VC or

PVC? _____

No.

Explain: S.C.B.A. for VC monomer and

PVC.

What respirators are utilized by the employees? Air line

respirators, S.C.B.A.

b. Is there a training program for employees which includes the

proper wearing of respiratory protection devices? Yes.

c. How often are the respiratory protection devices checked for

efficiency and effectiveness? S.C.B.A. - monthly.

If applicable, how often are cartridges or cannisters replaced?

Cannisters not checked regularly.

d. Other comments: S.C.B.A. for emergency use

checked monthly; S.C.B.A. for routine

use not checked regularly.

ADVANCE COPY

11. Maintenance and Decontamination Activities

- a. What procedures are established for maintenance and decontamination?

Contract maintenance crew regularly checks
process equipment for problems and
repair maintenance.

Are there periodic inspections for the:

Ventilation system? N.A.

Process equipment? N.A.

Piping and fittings? N.A.

Other? N.A.

- b. What transpires when leakage occurs? Immediate action

by maintenance crew (with S.C.B.A.)

- c. What provisions are there for the protection of employees in

cleanup of leaks or spills, maintenance or repair operations

on contaminated systems or equipment? airline respirators,
S.C.B.A.

What protective clothing and equipment are utilized? _____

Air supplied suits? No. Gloves? Yes

Respirators? Yes Others? _____

- d. How are employees decontaminated after work is completed? _____

Wash hands, showers provided.

ADVANCE COPY

11. Maintenance and Decontamination Activities--Continued

e. Are maintenance repair cleanup crews available during all shifts?

Yes.

OCC 0641

ADVANCE COPY

12. Fire Protection

a. What provisions are made for fire protection?

Local fire dept.
1/4 mile from entrance to plant; city and own emer-
gency water supply; sprinkler system in
office building.

Who approves the fire protection plan?

Plant safety
engineer

b. Who conducts fire inspections?

American Risk
Management company

What is the frequency of the inspections?

Semi-annual;
weekly self-inspection.

c. Are there fire insurance engineers?

Yes.

Give particulars:

from insurance company -
American Risk Management

ADVANCE COPY

13. Employer Monitoring

a. What is the method of sampling?

Air-bag grab samples; Caudery Hazardous waste model for combustible gas - indicates L.E.L.)

Are grab samples taken?

yes

How?

gump + plastic bag

Are continuous samples taken?

no

How?

If sensors are used, where are they located?

for Caudery HC master - outside maintenance building.

b. Are personal samples taken?

yes

How?

gump + plastic bag

For how long?

10 minutes

What is the sampling rate?

N.A.

What areas of activity are the employees in when monitored?

All plant activities

What percentage of employees are monitored in each area?

100%

What is the frequency of monitoring?

2 samples/week/job

c. What method is used to analyze the samples collected in the

monitoring program? Fluorination gas chromatograph

What is the sensitivity?

0.1 ppm

What is the accuracy?

low known

d. What is the disposition of the results of sample analyses?

Comparing monitoring data at all employees including contract maintenance personnel.

OCC 0643

ADVANCE COPY

13. Employer Monitoring--Continued

Are the employees informed? Yes.

Are the results recorded? Yes.

Where are the records kept? Superintendent

How long are records of the results maintained? Since start of program

Are the results available at all times to the employees? Yes.

OCC 0644

ADVANCE COPY

14. Medical Program

a. What does the in-house medical program consist of? pre-

placement physical; first aid +
medical exam. for program.

Are physical examinations of employees required? yes

Preplacement? yes

Periodical? yes

What does the physical examination include? (see

attached sheets)

Is there a medical surveillance program in effect? yes

What does it consist of? (see attached sheets)

Does the employee have access to his medical records? yes,

thru personal physician.

Is there a physician and nurse on duty at all times? No

If not, when? hour at plant; see below.

How many employees are trained in first aid? 12 (P.C. advisors)

b. What satellite-support medical facilities are readily available?

Clinic + hospital (24 hr. coverage)

What is the distance to the nearest hospital which would be

readily available at any time? 4.5 miles

Would adequate, appropriate, medical services be available

there? yes

Is there a contract or working agreement in force with this

facility? yes

Other comments: Coverage: day-physicians'

clinic; night-hospital

OCC 0645

ADVANCE COPY

15. Emergency

In the event an emergency should occur for any reason within the operation whereby employees are involved, what plan would be implemented?

Emergency repair + maintenance plans.

- a. Is there an evacuation plan? No formal plan, formalized authority to call evacuation
- b. Are there definite emergency procedures established to include authorization for individual control of assigned personnel?

No.

- c. Is there a mutual support plan for outside assistance in the event of a catastrophic incident such as fire, explosion, massive spill?

Yes.

Explain: Agreement with local fire company, outlying fire co's can be summoned