



MEMORANDUM

December 19, 1983

TO: Peg Donahue
FROM: Meredith N. Scheck
SUBJECT: "What Every Employee Should Know About PVC"

Fran Lichtenberg, SPI's assistant technical director, has noted a few comments in the margin of the 11/29/83 draft of the replacement for "What Every Employee Should Know About PVC."

Meredith

Meredith N. Scheck

MNS:jmd
Attachment

SAL 000070586

A Division of

THE SOCIETY OF THE PLASTICS INDUSTRY, INC.

355 LEXINGTON AVENUE • NEW YORK, N.Y. 10017 • (212) 573-9400

1. Q. WHAT IS THE DIFFERENCE BETWEEN VINYL CHLORIDE AND PVC?

A. Vinyl chloride, the chemical from which PVC is produced, is a monomer (mono meaning one). When many molecules of vinyl chloride monomer are chemically joined together, they produce the polymer (poly meaning many) polyvinyl chloride, or PVC. Vinyl chloride is a gas and is classified as a hazardous material which is strictly regulated by OSHA. It is transformed in a chemical reaction to a white granular powder, PVC, which is a nonhazardous material. This is a one way reaction, similar to what happens to a raw egg when fried; once fried it can't be changed back. So PVC powder cannot revert back to vinyl chloride.

2. Q. WHY IS THERE A VCM WARNING LABEL ON PVC CONTAINERS?

A. Bags containing PVC have the following warning printed on them: "Polyvinyl Chloride - Contains Vinyl Chloride - Vinyl Chloride is a cancer-suspect agent". This warning is specified by the OSHA Vinyl Chloride Standard which was promulgated in 1974. It was required based on the potential for residual VCM to be present in PVC containers that could result in employee exposures. As a result of changes in process technology and EPA regulations dealing with residual VCM concentrations in slurries during processing, the potential for significant levels of residual VCM to exist in PVC products is extremely low. However, despite these changes the OSHA regulation has not been changed.

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3. Q. DO I HAVE A POTENTIAL FOR EXPOSURE TO VCM WHILE WORKING IN A PVC (PRODUCT) FABRICATING PLANT?

A. Studies in PVC fabricating plants have shown that measured exposures to employees handling PVC is well below the OSHA PEL of 1.0 ppm and generally

below the action level of 0.5 ppm.

4. Q. WHAT ABOUT PVC DUST? IS IT TOXIC?

- A. Exposure to PVC dust itself is a concern when handling the product. PVC dust is ~~not considered to be~~ classed as a nuisance dust. Nuisance dusts have little adverse effect on the lungs and do not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Long-term exposures to large amounts of dust could result in simple obstructive lung disease. The OSHA permissible exposure limit for nuisance dust is 15 mg/m³. This is a level at which you would probably have visibility problems as well. Normal good ventilation practice and housekeeping would maintain exposures far below this level.

5. Q. TELL ME THE DIFFERENCE BETWEEN ADEQUATE AND INADEQUATE VENTILATION.

- A. This is a difficult question to answer without knowing any specifics of your workplace. In general ventilation should be designed to control PVC dust. It should prevent accumulation of dust in the air during a working period. (Both localized (i.e. hoods) and general building ventilation are usually used to accomplish this by capturing dust at specific work stations and creating air changes per hour in large working areas.)

6. Q. HAVEN'T HIGHER INCIDENCES OF CANCER BEEN REPORTED IN PVC WORKERS?

- A. There is often confusion concerning health effects observed in PVC workers. These reports deal with workers in plants that either manufacture VCM or convert VCM into PVC resin through a process called polymerization. No cancer cases attributable to VCM exposure have been reported among workers employed in PVC fabricating plants.

*adequate
ventilation*

*usually this is
accomplished by
a combination
of local exhaust
ventilation (e.g. hoods)
which captures the
dust at the
work
position
and general plant
ventilation.*

7. Q. WHAT CHEMICALS AM I EXPOSED TO DURING THE PROCESSING OF PVC?

A. Depending on the end use for PVC small amounts of various additives are blended with the resin to give the plastic desired properties. These additives include plasticizers, flame retardents, and other stabilizers. During thermal processing, these additives can cause distinctive odors in the processing areas. Although you can smell them, the concentration in the air is very small and in most cases undetectable in air samples taken from the workplace.

8. Q. I HEAR THAT PVC PRODUCES POISON GAS WHEN IT'S BURNED. ARE THESE POISON GASES PRODUCED IN MY FACTORY?

A. All organic materials can burn. When burned, they release a lengthy list of chemical by-products. For instance, when wood (a natural organic) is burned, as many as 175 different fire gases may be produced. Polyvinyl chloride produces numerous by-products when burned -- many of which are exactly the same as those produced by burning wood. Carbon dioxide, carbon monoxide and hydrogen chloride (HCL) account for approximately 97% of the total volume of gases produced by burning vinyl. The remaining 3% consist of benzene and an assortment of other gases. Again, these gases are produced only when PVC is burned.

Need another sentence here to say PVC is not being burned during processing

9. Q. I HEAR THAT DOP AND DEHP CAUSE CANCER - WHAT DOES THIS MEAN TO ME?

6/13/83
for PVC

PVC Dust--Questions

1. What is it?
2. What happens when it comes into contact with your eyes, skin, when you inhale it? Long term affects?
3. Can it harm cars, vegetation, etc.?
4. Will it contaminate soil, water, air?
5. What kind of regulations are there on emissions?

Q. How can you say that PVC is not considered a carcinogen? The tag on the car says it is.

A. The tag is put there by law. The cancer causing agent is not PVC but VCM, one of the chemicals from which PVC is made, and which is almost totally changed to PVC in the reaction.

Q. Isn't there some unreacted VCM remaining in the PVC?

A. Yes, there is a minimal amount of VCM remaining in PVC. It has been reduced substantially in recent years to a level at which there is no hazard. We have gotten the residual VCM so low, OSHA and EPA do not regulate our customers. That is, studies have shown that there is no significant VCM exposure to workers in PVC fabricating operations.

EXAMPLE: The residual VCM level in PVC is typically below 1 ppm. Other examples of low level carcinogens in food, for comparison are:

aflatoxin - peanuts, soybeans
benzene in gasoline 1-5%
lead in hair preparation
arsenic/selenium in the soil
CMS -- PNA's (?)

Q. You say that PVC is not a cancer causing agent. I have heard of a toxicity test which listed PVC as a cancer suspect agent.

A. There was a study where tumors were formed in animals. In that case pieces of PVC were implanted under the skin and tumors formed in the vicinity. This is thought to be a local irritant-type reaction because the same reaction did not occur when powdered PVC was implanted.