

PVC EMPLOYEE BROCHURE

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

A. Vinyl chloride is a gas from which PVC is produced. It is a hazardous (flammable) material which is strictly regulated by EPA, DOT, and 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 SOME PVC CONTAINERS?

A. OSHA requires containers of PVC to have the following warning: "Polyvinyl Chloride - cancer suspect agent." This warning is specified by the OSHA Vinyl Chloride Standard which was put into effect in 1974. It was originally required based on the potential for residual VCM to be present in PVC which could result in employee exposures. As a result of improvements in process technology and stringent EPA regulations, residual VCM levels in PVC are extremely low. However, even with these changes, and the resulting insignificant exposure potential, this portion of the OSHA regulations has not been changed.

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

A. PVC dust is non-toxic and is classed as a nuisance dust. Nuisance dusts have little effect on the lungs and do not cause disease when workplace exposures are controlled properly. Long-term exposures to large amounts of nuisance dusts may result in a physical irritation of the nose or lungs and cause a physical blocking of the small airways in the lungs. The OSHA permissible exposure limit for nuisance dust is 15 mg/m³. This is a level

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at which it would probably be difficult to see across a room. Exposures are easily maintained below this level with adequate ventilation.

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

A. Adequate ventilation is generally accomplished by a combination of "local" exhaust systems (such as hoods), which are placed in specific process areas or workstations that produce dust and vapors, and general room ventilation, which changes the air in an area several times an hour. Good work practice and adequate ventilation should prevent an accumulation of dust and vapors in the air during working periods.

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

A. These reports deal with workers in plants that manufacture VCM or convert VCM into PVC through a process called polymerization. No cancer cases attributable to VCM exposure have been reported among workers employed in PVC fabricating plants.

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

A. Poisonous gases, mostly hydrogen chloride and carbon monoxide, are released when PVC burns. However, at normal processing temperatures and conditions PVC will not release these gases. In an upset processing or equipment fire situation, such as an overheated die face, these gases could be released into the working area.

8. Q. I HEAR THAT SOME PLASTICIZERS PRESENT IN PVC CAUSE CANCER. IS THAT TRUE?

A. The only solid evidence of carcinogenicity of DEHP comes from a recent rat and mouse study. In this study, the animals were fed food containing high concentrations of DEHP for 103 weeks. The incidence of liver tumors, or cancer, was increased in the rats and mice. This effect was seen at very high dose levels. Two animal studies prior to this study, at lower dose levels, were negative.

The relevance of these findings to human exposure by a different route, such as breathing, is questionable. Also, air sampling for plasticizers such as DEHP in fabricating areas show very low concentrations.

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DOP, DEHP

Few ^{human} studies are available that evaluate possible adverse effects of chronic exposure to DEHP and none of these specifically address the possibility of an association between DEHP exposure and cancer. [The only ^{solid} substantive evidence of carcinogenicity of DEHP comes from a recent NTP Rat and mouse study. In this study the animals were fed ~~seed~~ containing (^{high concentrations} from 3,000 to 12,000 ppm) of DEHP for 103 weeks. The incidence of liver tumors, or cancer, was increased in ^{both} rats and mice. This effect was seen at ~~high~~ very high dose levels and two animal studies prior to this study, at ~~low~~ ^{lower} levels (~~below 4,000 ppm~~) were negative.

The relevance of these findings to human exposure by a different route, such as breathing, is questionable. Also air sampling for plasticizers such as DEHP in fabricating areas show very low concentrations.

* high concentrations
* lower levels

Tom - you forgot to
stop by for this. We
can talk about it
after the
holidays.
PEB

BFGoodrich
Chemical Group

Nora

① Sorry - but I think this needs
lots of work. Too often it tries
to avoid the question rather than
facing it squarely.

② Delete Waltemate. add
Bob Henderson or Maury Johnson.

Jim Tanzilli.

DRAFT 11/29/83

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 ^{It is} and is classified
as a hazardous ^(flammable) material which is strictly regulated by ^{EPA, DOT and} OSHA. It is trans-
formed 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.

Note: This is not
regulation specific to G99s only

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 ^{improvements?} 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} ~~has~~
not been changed.

What is
significant?

Not the
rest ending.
It's negative.
With RVCN in
low RVCN in
today's resins,
workplace exposure to
VCM is well within
OSHA limits. The
label is virtually
meaningless, although
still required by
regulation.

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 ^{permissible exposure limit} PEL of 1.0 ppm and generally

Do lay
people know
what this
means?

More
what?

below the action level of 0.5 ppm.

point?

In other words, the answer is "yes", and exposure could be significant (i.e., above 0.5 ppm). I believe potential exposure depends on factors not mentioned - including ventilation practice. We've reduced VCM. The employee has to couple that with good work practice rules and ventilation to preclude exposure. Try again.

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 non-toxic and would 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 ^{any} 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.

Means what?

Means what?

Long people may not understand that his means low hazard. Can this be rewritten in layman's language? I suggest this be clarified. Some will believe this means eye disease.

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~~ ^{should be} used to ~~accomplish this by~~ capturing dust at specific work stations and creating air changes per hour in large working areas.

What about VCM? What about processing vapors? The answer is not complete without addressing vapors.

how many?

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. Cancer has only occurred among workers in facilities which these reports deal with workers in plants that either manufacture VCM or handled vinyl chloride monomers. Today, there is virtually no exposure 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. Furthermore, PVC does not cause cancer.

wrong
to VCM, either as a result of processing PVC.

Jack! 7. Q. *People can be affected by PVC vapors. This must be reworded.*

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 ^{PVC} resin to give the plastic desired properties. These additives ^{can} 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?

comparison to burning wood isn't relevant, in my opinion. Needs to be reworded.

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.

Not true. HCL & benzene, at least are produced before ignition and HCL is a possibility during normal and abnormal processing.

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

(?)