



DOW CHEMICAL U.S.A. *XC: CAC
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MIDLAND, MICHIGAN 48640

June 10, 1974

DOW CONFIDENTIAL

R&S 027490

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DOW POSITION ON VINYL CHLORIDE

The attached statement was agreed upon by the Dow Industrial Health Board at its May 29 meeting. You will note the recommended Dow guideline for vinyl chloride is stated as follows:

"The TWA exposure for an 8-hour day shall not exceed 10 ppm for any individual, the short-term limit for 10 minute exposures shall not exceed 25 ppm, and no peaks greater than 50 ppm shall be permitted."

This guideline is for internal use by The Dow Chemical Company and is not for publication.

It has been reviewed and accepted by people representing production, research and product departments. Please keep your people informed.

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Attachment



DOW POSITION STATEMENT - VINYL CHLORIDE

There is much work going on relative to assessing the toxicity of vinyl chloride monomer (VCM) and to translating the data available into appropriate work practices which will permit the material to be manufactured, handled and used with a high degree of safety.

The most pertinent toxicological data available may be briefly summarized as follows:

- 1) A few humans who were exposed to VCM years ago have developed cancer of the liver (angiosarcoma). The intensity and duration of the exposures they received are unknown except that they are believed to be high, even to the extent of causing dizziness and unconsciousness.
- 2) Examination of all the medical records available on persons who have worked with vinyl chloride at Dow have revealed no cases of angiosarcoma of the liver. Exposures that occurred prior to about 1960 in the Midland facility were in the range of 200-300 ppm on a time-weighted average (TWA) basis with peaks of short duration (minutes) ranging up to 1000-2000 ppm on a few particular jobs where documentation is available. Since 1960, when continuous monitoring was initiated along with a 50 ppm guideline, TWA exposures, with one exception, have been below 50 ppm with rare short excursions into the 1000-2000 ppm range. The one exception is a location where concentrations range from 100 to 150 ppm and respiratory protection is required. In recent years, personnel monitoring at outdoor plants in other locations has revealed TWA exposures to be controlled within the existing Dow guideline.

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- 3) The toxicological studies on animals in the Italian laboratories of Professors' Viola and Maltoni have revealed numerous cancers of the liver (angiosarcomas) and other malignancies in rats exposed 4 hours/day, 5 days/week for extended periods of time to VCM concentrations of 250 ppm and higher. At 50 ppm, one angiosarcoma and one nephroblastoma have been observed in rats that survived for 135 weeks, well beyond the normal life span. Mice exposed for 35 weeks to 2500 ppm have developed angiosarcomas of the liver, mammary carcinomas (possible too few to be significant) and adenocarcinomas of the lung. At concentrations of 500 and 250 ppm, mice have developed adenocarcinomas of the lung but at 50 ppm no cancers have been reported. Intermediate and lower concentrations are being studied.
- 4) Toxicological studies on animals sponsored by American industry through the MCA are being conducted at Industrial Bio-Test Laboratories (IBT), of Northbrook, Illinois. In these studies, rats, hamsters, and mice have been exposed 7 hours/day, 5 days/week for up to 7 months at concentrations of 2500, 200, and 50 ppm. No angiosarcomas have been observed among the rats or hamsters, but tumors have been observed in the livers (angiosarcomas), lungs, and subcutaneous tissue of the mice at all three levels of exposure. The subcutaneous tumors tentatively are considered to have originated from mammary tissue or Zymbal's gland of the ear canal. The incidence of tumors appears to be dose-related.

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The finding of tumors in mice and rats exposed to 50 ppm VCM has increased the political pressure in Washington for a downward revision of the limits as specified in OSHA's Emergency Temporary Standard for Exposure to Vinyl Chloride published in the *FEDERAL REGISTER*, Friday, April 5, 1974, Vol. 39, No. 67, pp 12342-4. We also feel that it is desirable to increase the margin of safety but not to the extent called for in the proposed permanent standard published in the *FEDERAL REGISTER*, Friday, May 10, 1974, Vol 39, No. 92, pp 16896-900.

DOW RECOMMENDATIONS

Area Monitoring. Work areas in which VCM may reasonably be expected to exist should be monitored continuously using an automatic sampler, analyzer and printout, if feasible. Other detection devices may also be used for spot or routine repeated sampling as needed. An analytical sensitivity of 1 ppm must be required. Monitoring records are to be summarized, verified and permanently stored in a retrievable manner.

If monitors show the concentration in the work area to exceed 25 ppm, all persons must don appropriate respiratory protection if their exposure is expected to last more than 10 minutes. If monitors detect a concentration of 50 ppm or more, they shall automatically activate an alert which requires all persons to evacuate the area. Re-entry shall be allowed only when appropriate respiratory equipment is being worn.

If some event occurs from which there is a potential for 50 ppm or more in the work area, an alert shall be sounded and action as described immediately above must be taken.

If work must be done in areas which consistently approach or exceed 25 ppm as determined by sound industrial hygiene studies, workers shall always wear appropriate respiratory protection when entering such an area. These areas shall be well identified.

Personnel monitoring. Personnel monitoring shall be conducted so that an evaluation of the actual exposure of individuals by inhalation can be calculated; i.e. the samples must be taken from the breathing zone of the person. A person wearing appropriate respiratory protection in a contaminated area as determined by area monitoring may not be exposed at all and this must be taken into account in the assessment of the individual's total exposure as determined by proper industrial hygiene practices.

Recommended Dow guidelines for vinyl chloride. The TWA exposure for an 8-hour day shall not exceed 10 ppm for any individual, the short-term limit for 10 minute exposures shall not exceed 25 ppm, and no peaks greater than 50 ppm shall be permitted.

5/28/74