

INDUSTRIAL HYGIENE INFORMATION ON VINYLIDENE CHLORIDE

At the request of EPA personnel, Dow Chemical facilities either manufacturing or processing vinylidene chloride (VDC) were contacted to obtain information regarding potential occupational exposures to VDC.

Approximately 130 personnel at Dow were identified from 1987 surveys as having the potential for occupational exposure to VDC through its manufacture or processing. These employees are distributed in the following job assignments:

TABLE 1

Number of Employees with Potential
Exposure to VDC at Dow Chemical
Manufacturing or Processing Plants
(1987 Survey Data)

Operators	41
Control Room Personnel	24
Supervision	34
Maintenance	26
Laboratory Personnel	3

Dow Chemical uses the American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Value (TLV) as an 8-hour time weighted average (TWA) industrial hygiene guide (IHG). The ACGIH TLV for VDC is 5 ppm (8 hour TWA) with a 20 ppm STEL. Potential 8-hour TWA exposures for VDC are provided in Table 2. Exposures reported here should be considered as potential in that respiratory protection in the form of cartridge respirators or breathing air units were worn during many of the sampling activities reported. Values reported in parentheses indicate the minimum analytical sensitivity for that particular sample series. Data reported are from 1987 industrial hygiene surveys.

TABLE 2

Employees' Potential 8-hour TWA
Exposure to VDC, 1987 Surveys
(parts per million, ppm)

Facility	No. of Samples	Mean	Range
Plant A	26	<0.5	ND (0.04) - 3.5
Plant B	4	<0.3	ND (0.08) - 1.1
Plant C	11	4.4	<0.01 - 21 ^(a)
Plant D	41	2.21	ND (0.01) - 31 ^(b)

(a) The two highest samples from this survey, 13 and 21 ppm (8-hour TWA) are based on short term exposures that occurred during the addition of chemical inhibitors. The plant plans to revise this addition system to reduce the exposure during this short term job. If the two highest samples are excluded, the mean becomes 1.3 ppm with a range of <0.01 . / ppm.

(b)Two high values were caused by unusual conditions in the plant. A 27 ppm value was caused by upset conditions in the plant, not normal operation. A 31 ppm value was caused by a plugged vent line on a filter. The filter could not be vented during a filter change. Filters are changed every 30 to 60 days. If these two values are excluded, the mean becomes 0.84 ppm with a range of ND (0.01) - 3.3 ppm.

Certain non-routine tasks may have the potential for higher exposure levels. Respiratory protection is provided to serve as personnel protection when non-routine tasks are performed and the potential for higher exposure levels exists.

Many technological improvements have been made in the last 20 years to reduce exposure. The use of ventilation, closed loop sampling systems, purging of lines back to a collection device, and technology to recover and contain unreacted monomer in processing applications have helped reduce exposure to VDC. Ventilation has been installed in drumming operations to reduce personnel exposure in that operation. Improvements continue to be explored and implemented.

One location reports that there are three continuous air monitoring systems in the plant which are designed to alarm when the VDC concentration exceeds desired levels. A total of 41 locations in that plant are monitored with Bendix gas chromatographs. The units are checked daily by an automatic calibration unit employing a standard gas cylinder. These units are present primarily for the detection and warning of leaks rather than for personnel monitoring (industrial

hygiene). The presence of such warning systems greatly reduces the likelihood for overexposure of employees.

Annual training and safety reviews are conducted with employees in the various facilities with regard to chemical hazards. Material safety data sheets (MSDS) are available to employees and hazard communication programs have been in place for many years. Respirator fit testing is provided for employees who use respirators in the normal course of their work.

Sincerely,

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