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BAK HJM APH-File Vinyl Chloride

Memorandum

February 6, 1974

TO: ORC Occupational Safety and Health Standards Group
Ad Hoc Task Force - Vinyl Chloride and Subcommittee on Drafting

FROM: Wayne T. Brooks, Leo Teplow, Bill Nichols

The Subcommittee on drafting a tentative first draft of occupational safety and health standard re manufacturing polymers from vinyl chloride, met and has drafted the enclosed tentative first draft.

This committee was composed of W. W. Madden, Coordinator, Special Projects, Firestone Plastics Company, Dr. E. Studley Smith, Head, Plastics Polymerization, The Goodyear Tire & Rubber Company, Dr. W. D. Harris, Industrial Toxicologist, Uniroyal, Inc., M. E. Sutherland, Program Manager, Process Safety Chemicals and Plastics, Union Carbide Corporation and Wayne T. Brooks.

The enclosed first draft followed fairly approximate to the conclusions that had been reached in the full task force meeting. However, as might have been anticipated, there were certain thoughts introduced which have been included in this draft which strengthen not only its application to the workplace but its attractiveness in discussion.

There will also be observed that although no specific figure has been established by the subcommittee, there are two places in this draft standard where the expression ---"a level below the applicable Threshold Limit Value (TLV) ---" is used. I sensed that the Subcommittee members all felt that the proper TLV level should be 50 ppm.

The only oth r blank space in the draft standard is at the very nd with regard to effectiv date.

There is also enclosed a draft of the standard which has been prepared by National Institute for Occupational Safety and Health. This was made available by Ed Baier, Assistant Director who was attending a meeting in our office of the Inter-Industry Study Group on Noise. The NIOSH draft is at this time intended to be the basis of the discussion at the meeting in Cleveland and which at this time is schedules at the Sheraton-Hopkins Motel at Hopkins Airport in Cleveland, Ohio from about 10:00 a.m. to 3:00 p.m. on Tuesday, February 12. There has been no final announcement made on this date but it is sufficiently firm that plans can be made based on it.

The meeting of our ORC Task Force on vinyl chloride will convene on Monday, February 11 at the ORC offices, Washington, D. C. at 10:00 a.m.

There has as yet not been time to prepare draft points of view with respect of questions 1 through 5 in the Federal Register publication of January 30, 1974, however, before the meeting on February 11 the writer will prepare such statements recognizing that they will be subject to considerable enlargement and improvements in the February 11 meeting.

TENTATIVE FIRST DRAFT
OF
OCCUPATIONAL SAFETY AND HEALTH STANDARD

RE: MANUFACTURING POLYMERS FROM VINYL CHLORIDE

1. Scope and Application

This standard applies to the process of manufacturing polymers from vinyl chloride, (chlorethene, Chemical Abstracts Registry Number 75014), beginning at the point where monomer is received and stored for purpose of entering it into the manufacturing process and ending at the completion of drying the polymers.

2. Work Practices and Task Methods

A. Cleaning Reactors

There are a number of process methods for emptying and flushing reactors; if after emptying and flushing, th reactor is not sufficiently clean to be reloaded and it becomes necessary for an employee to enter the reactor the following shall be included among the work practices:

i. the reactor shall be force ventilated until the air therein has reached a level below the applicable Threshold Limit Value and such ventilation shall continue as long as an employee remains in the reactor; (other standards applicable to employe entry into confined spaces shall be observed)

ii. polymer removed by the employee shall, as soon as practicable, be placed in a closed container, removed from the work area and disposed of in such manner as not to create a hazard.

Б. General Work Area

i. Ventilation shall be applied to maintain air, at/near employee breathing zone in the work place, below the applicable Threshold Limit Value.

ii. In the packaging and loading areas the presence of dust may make applicable the TLV for nuisance dust.

iii. Showers shall be available, and any employee who has entered a reactor during the work shift shall be required to take a shower bath and to change to clothing different from that which he has worn during the shift.

iv. The employer shall have established an emergency conditions plan, including assigning and training employees for their specific duties and precautions in such conditions.

v. Each unloading line and each vapor equalizing line shall be equipped with a vent connection permitting pressure to be vented, at the completion of unloading, to a point remote from employees' work place.

3. Work Place Air Sampling and Analysis

A. Work place air at near employee breathing zone shall be sampled and analyzed according to professional Industrial Hygiene methods, procedures, and frequencies.

B. Records of air sampling and analysis, identifiable with the specific work place, shall be made of each sampling and analysis. Such records shall be retained for at least 20 years after the date of entry, and shall be available to the Secretary of Labor, and the Secretary of Health, Education and Welfare.

4. Signs

Entrances to the physical areas of an establishment to which this standard applies shall be posted with signs bearing the legend:

HAZARDOUS AREA
AUTHORIZED PERSONNEL ONLY
NO THRU PASSAGE PERMITTED

5. Training

Each employee prior to being assigned to work at a place of employment to which this standard applies shall receiv such training and instruction as may be necessary to acquaint him with the hazard of the process to which this standard applies, the requirements of this standard and his responsibilities with regard to this standard.

6. Physical Examinations

A. Each employee prior to being assigned to work at a place of employment to which this standard applies shall be provided such physical examination as is designated to be applicable by the Medical Profession; special attention should be directed to the present condition of the employee's liver and any history of liver ailments.

B. Such physical examinations shall be repeated periodically, not less frequently than annually.

C. Records of physical examinations shall be made; periodic physical examinations shall be identifiable with the specific workplaces to which the employe has been assigned since the last previous physical examination. Such records shall be retained for at at least 20 years after the employee leaves employment of the employer.

D. Records of physical examinations shall be available to the employer, the Secretary of Labor, and The Secr tary of Health Education and Welfare. Physicians designat d and authorized by any employee or former employee shall have access to such employee's medical records.

7. Effective Date

This standard shall become effective on and after ____ ____.

NIOSH Recommended Precautionary Monitoring and Control Procedures for Polymerization Processes Involving Vinyl Chloride

I. General Housekeeping Procedures

A. The spillage of Vinyl Chloride and Polyvinyl Chloride in and around the production facilities should be controlled as follows:

1. Housekeeping procedures should be implemented to assure immediate removal of VC and PVC material around polymerizati n operations including drying, packaging and loading operations.

2. Recovered PVC material which is to be packaged should be stored in closed containers.

3. Waste PVC material should be stored in closed containers and consideration should be given to the adequacy of its disposal and/or destruction. Care should be taken in the storage of closed containers to insure that unsafe conditions do not result from an internal build-up of pressure in the container.

B. Inventories of beginning and recovered quantities of VC and quantities of PVC produced, packaged and recovered should be made to determine losses and probable areas affected.

C. PVC material should be removed from overhead structures and conduits where it tends to collect.

D. Consumption of food should be permitted only in separate facilities provided for this purpose, and no food products should be permitted elsewhere in the polymerization facility.

II. Protective Clothing

A. A daily change of protective clothing including full coveralls, or the equilvalent, should be provided each employee in areas where possible exposure to VC PVC could occur. Clothing contaminated by accidental spills should be changed as soon as feasible.

B. Protective gloves and footwear, or footcovers, should be worn as appropriate in those PVC operations where exposure to PVC material is possible.

C. Protective head covers should be worn during PVC operations as appropriate (e.g. hard hats in those areas where physical protection of the head is necessary and hair coverings, or the equilvalent, in

operations such as cleaning of polymerization reactor tanks and packaging operations).

D. Where employees are engaged in maintenance or cleaning operations of polymerization reactors tanks they should wear full impervious suits to guard against skin contact of PVC material and VC vapors. Procedures for safe entry to confined spaces should be observed.

III. Showers

Showers at the termination of an eight-hour work shift should be mandatory for all workers with possible contact with VC-PVC.

IV. Monitoring

A. Environmental Monitoring

1. In-plant environmental monitoring programs should be implemented; and where workers are required to enter polymerization tanks, a survey of the VC concentrations should be made in the reactors immediately after opening, immediately prior to entry of maintenance personnel and during the tank cleaning operation.

2. Data obtained from the environmental monitoring program should be used to indicate those areas where efforts should b directed to reduce airborne levels of VC.

3. Positive programs to initially control VC levels well below the present Federal Standard of 500 ppm should be developed (some companies are targeting at 50 ppm) and efforts to further reduce levels should be given consideration concomitantly with the necessary modifications in engineering and design controls.

4. The concentration of VC in exhaust ventilation should be determined to estimate the amount of VC lost during operations and the possible exposure of personnel immediately outside the facility.

5. Monitoring for PVC particulate material should be accomplished to estimate the degree of exposure to this substance throughout the facility.

B. Personal Monitoring

1. Integrated, eight-hour personal monitoring samples should be obtained from those employees considered to receive the greatest exposure to VC or PVC.

2. Breathing zone samples should be obtained to complement environmental monitoring program for VC, and similar samples should be obtained for PVC.

V. Respiratory Protection

Because VC is a gas under ambient conditions and PVC is a solid under these conditions, it is recommended that respiratory protection for employees take these circumstances into consideration.

A. Where employees are engaged in cleaning and maintenance operations inside polymerization reactors they should be equipped with an atmosphere-supplied respirator in order to protect against both VC vapor and PVC particulates.

B. During housekeeping procedures and packaging operations where the possibility of PVC dust inhalation is a factor, it is recommended that an air-purifying respirator equipped with a mechanical filter designed to remove particulate material be worn. Respiratory protective devices which meet this requirement, as well as protect against VC vapors in concentrations less than 0.1% have been approved by the NIOSH Testing and Certification Laboratory and bear the numbers: TC-23C-40, TC-23C-47, TC-23C-48.

C. Where employees are engaged in transfer operations of VC from railway tankcars to storage facilities or at any similar transfer point which requires manual operations, they should wear a self-contained breathing apparatus (SCBA) during such operations to guard against unexpected release of VC during such operations.

D. Other operations involving possible exposure to VC or PVC should be evaluated as the individual situation exists and respiratory protection provided as appropriate.