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# RUBBER & PLASTICS

## NEWS

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## Vinyl Chloride Final Standard Stirs Protests

### PVC Industry Fears Tough OSHA Stand Spells Doom

By EPH Washington News Bureau

WASHINGTON—The U.S. Occupational Safety and Health Administration (OSHA) issued its anxiously awaited final standard for worker exposure to vinyl chloride on Oct. 4, and while the result wasn't the "no detectable" limit originally proposed by the agency, it was tough enough to raise a storm of industry protest—and at best faint praise from labor.

Within a few minutes of the standards' announcement, the Society of the Plastics Industry filed a petition for review of the standards in the Second Circuit Court of Appeals in New York.

Additional lawsuits followed in rapid succession. Hooker and Union Carbide filed similar suits in the New York Court, while Tenneco and Air Products filed in the Third Circuit Court and Firestone in the Sixth. B.F. Goodrich is expected to follow suit.

**THE TOUGH** new standard that has stirred such vehement opposition will require industry to reduce vinyl chloride concentration in air to no more than one part per million parts of air (ppm) over any eight-hour period and no more than five ppm over any period no longer than 15 minutes. OSHA has established a three-phase schedule for plants and factories to meet the standards.

Perhaps the most vehement rejection of the standard came from Todd C. Walker, president of the Firestone Plastics Co. Walker charged that the new standard "puts the vinyl plastics industry on a collision course with economic disaster."

Walker cited an economic impact study made earlier this year by the Arthur D. Little Co., based on an initial proposed standard similar to the final permanent standard issued October 4. According to the Little study, Walker said, a standard as tough as the one now going into effect would cause the loss of some 2 million industry jobs.

"This [Little] study and other medical, scientific and engineering data submitted by the industry and by individual companies in response to OSHA's request," Walker said, "appear to have been completely ignored in establishing the standard."

**THE RESULT**, said Walker, is a standard that is "economically unrealistic, technically unfeasible, politically motivated and medically ridiculous." It is comparable, he said, "to a law aimed at stopping automobile deaths by lowering the speed limit to one mile per hour."

Firestone, Walker said, would initiate "necessary legal steps" to challenge the new standard.

Spokesmen for Goodyear, meanwhile, declined to comment on the substance of the standard, indicating only that the company would take the necessary steps to try to comply. And, at least one firm, Robintech Inc., indicated that only minor alterations would be required to comply with the standard.

In posting the permanent standard, OSHA officials acknowledged the difficulty some segments of the industry would have in achieving compliance.

"There is little dispute that VC [vinyl chloride] is carcinogenic [cancer-causing] to man and we so conclude," said OSHA Chief John H. Stender.

"However," Stender added, "the precise level of exposure which poses a hazard and the question of whether a 'safe' exposure level exists cannot be definitively answered on the record. Nor is it clear to what extent exposures can be feasibly reduced."

But, Stender emphasized, OSHA "cannot wait until undisputable answers to these questions are available... lives of employees are at stake."

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ACCORDINGLY, he said, "on the basis of the best available evidence," OSHA has judged that the exposure limit must be reduced to 1 ppm on a "time-weighted average [TWA]" to protect workers.

"We also believe," Stender concluded, "that PVC [polyvinyl chloride] and VC establishments will, in time, be able to attain that level through engineering controls, and that fabricators can do so in the immediate future."

Noting that the standard will apply to the entire VC industry, including manufacturers of vinyl chloride monomer (normally a gas) and polyvinyl chloride polymer (normally a resin compound used in a number of plastic materials) and fabricators of plastics products using VC and PVC (employers who use or handle finished fabricated products are exempt). OSHA officials summarized key provisions of the standard as follows:

- Employers must set up "regulated areas" where concentrations of VCM (vinyl chloride monomer) exceed the "one and five ppm" limits, with access limited to "authorized" workers.

- Plans for reducing exposure to the permissible "one and five ppm" levels must be available on request of OSHA.

- Direct contact by employees with liquid VCM is prohibited.

- Monitoring and measuring programs must be initiated to learn whether exposure levels exceed 0.5 ppm. Depending on levels found, repeat measurements are required at least monthly or quarterly. They may be discontinued only when two consecutive measurements, no fewer than five working days apart, show individual employee exposures to be less than 0.5 ppm.

- Monitoring and measuring methods must meet accuracy requirements ranging from not less than  $\pm 50\%$  in concentrations from 0.25 through 0.5 ppm, to  $\pm 25\%$  for levels greater than one ppm.

- Where the regular monitoring program shows excursion levels may exceed 25 ppm, a continuous monitoring and alarm system must be used to alert em-

ployees to potential danger if they are using air filtering respirators (gas masks). At that level they must switch to respirators with a clean air supply.

- Protective garments as well as respiratory protection must be provided for employees in hazardous situations, such as cleaning operations in PVC vessels.

- Medical programs must include complete initial examinations. Subsequent ones will be required every six months for employees who have worked in VCM or PVC operations for 10 or more years, and annually for all other exposed workers. Alternative medical examinations will be acceptable if the examining physician states his procedures and reasons for substitution. All medical checks are at no cost to employees.

- Specified signs or labels are required at entrances to "regulated areas," in

hazardous operations or emergency areas, on containers of PVC resin waste, PVC containers and VCM containers.

- Records of required monitoring and measuring, medical records, and rosters of "authorized" workers must be kept for varying specified times, or be sent to the Director, National Institute for Occupational Safety and Health, if an employer ceases to do business before the expiration of retention periods.

- Reports must be made to the nearest OSHA Area Director no later than one month after establishing a "regulated area," and within 24 hours of any "emergency" exposure. Also, reports to affected employees must be made within 10 days after monitoring and measuring shows exposure in excess of the "one and five ppm" limits, including the results of the measurements and steps being taken to reduce exposure to permissible levels.

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# Explosive Controversy

## The Dispute Over PVC Sends Shock Waves Throughout Industry

By DANA L. THOMAS

**D**ISCLOSURE last January of the death from angiosarcoma, a rare cancer of the liver, of three workers at B. F. Goodrich's polyvinyl chloride resin plant in Louisville prompted the U.S. Occupational Safety & Health Administration (OSHA) to take stiff measures to reduce the health hazard. After imposing temporary lower exposure levels for the chemical, OSHA ruled in October that, beginning next January 1, producers and fabricators must equip their plants to cut the level to near-zero — one-part per million — compared with the 50 parts per million previously in effect. Arguing that it is technologically and economically unfeasible to meet such a rigid standard, representatives of the industry have filed a suit seeking modification of the OSHA ruling; oral hearings will be held by the U.S. Court of Appeals this Friday. Meanwhile, the Society of the Plastics Industry has asked the court for an extension of its January deadline.

Needless to say, the polyvinyl case has sent shock waves throughout the industry. PVC resin is a basic material played in a host of industrial and household products. Major uses include the packaging of food, the upholstery, wiring and component parts of autos, in building and construction, phonograph records, piping, luggage and sporting goods. While producers employ 6,000 workers to turn out and fabricate the resin, two million jobs depend on its use. The value of products dependent on PVC runs over \$60 billion a year. In short, the OSHA ruling could have an adverse impact on a big slice of the U.S. economy.

### "Blow Whistle on Itself"

Ironically, prior to the public announcement of the death of the Goodrich workers, the PVC industry itself did all the medical research which established the link between vinyl chloride and cancer. Ralph L. Harding Jr., president of the Society of the Plastics Industry, declares: "This is a unique situation. Industry financed the studies and blew the whistle on itself."

However, government agencies rushed in quickly thereafter, making up for lost time by imposing what industry spokesmen claim are unrealistic safety standards. The PVC issue is a test case and perhaps only the first in a long line of controversies ahead. For OSHA is just one of several new government agencies which have been established since 1970, as a result of the lobbying of environmentalists, the rise of consumerism and the growing crusade for industrial health reforms.

The OSHA ruling on exposure levels already has had repercussions in the PVC business—including pressure on stock prices of major producers. Goodyear has announced it is shutting down a facility at Niagara, slashing its output of PVC resin by 50%, or 50 million pounds, and eliminating 60 of the plant's 430 jobs. Goodrich, while programming a \$42 million outlay over the next three or four years to reduce worker expo-

sure, claims that even this huge investment will not enable it to meet OSHA's stringent requirements without resorting to respiratory equipment. The latter, it points out, not only could reduce worker productivity, but even more important, also pose a health hazard.

### Severe Resin Shortages

Industry observers warn that if OSHA persists in its ruling, many more firms will be forced to shut down wholly or partially, creating a severe shortage of the resin and skyrocketing prices. On the other hand, government agencies, labor unions and lobbyists for industrial health controls argue that corporations must be held socially accountable and forced to put considerations of human life and safety above profits—whatever the cost. So the battle has been joined; the outcome, as noted, will have far-reaching effects.

Vinyl chloride, the basic raw material for polyvinyl resin production, is a gas at room temperature; it is synthesized from chlorine and ethylene in plants which resemble oil refineries. It was launched commer-

December, Dr. John Creech, a company doctor, learned that Earl Parks, who had begun working at the facility in 1943 and had been forced to retire in the late 'Sixties, owing to poor health, had died the previous August of a liver disease. Concerned about the suspiciously high number of Goodrich workers suffering liver diseases, Dr. Creech asked to see an autopsy on Parks. When he learned that Parks had died of angiosarcoma of the liver, the doctor recalled that two years before another Goodrich worker had succumbed to the same disease. Since angiosarcoma is exceedingly rare, the incidence of two such deaths in the plant's small workforce struck Dr. Creech as highly ominous.

He contacted Goodrich's occupational health director, who hired Tabershaw-Cooper Associates, an epidemiological research firm, to conduct an investigation of the mortality files of Goodrich workers. This had barely begun when a third worker, who had been at the Goodrich polyvinyl plant for 23 years, died of angiosarcoma. Greatly dis-

other blow. It was disclosed that an Italian Professor of Medicine, Cesare Maltoni, had discovered—two years before the announcement of the Goodrich deaths—in laboratory experiments that rats exposed to 250 parts per million of vinyl chloride developed angiosarcoma. The information had been transmitted to the government and medical societies in the U.S., but nothing had been done about it. Indeed, up until the Goodrich fatalities, OSHA continued to insist that it was safe for production plants to operate at a 500-ppm exposure level.

Another disclosure was equally sobering. Even before Professor Maltoni's discovery, Solvay & Cie, a Belgian polyvinyl maker, which became worried over the increasing incidence of acro-osteolysis among workers at its plants, hired Dr. P. L. Viola to do medical research on the subject. Dr. Viola was unable to develop acro-osteolysis in his laboratory animals, but it produced something worse—cancer of the liver.

### Requested Secrecy

The results were reported in Tokyo in 1969, and in 1970, to the Tenth International Cancer Congress, meeting in Houston. To check out Dr. Viola's studies, four European chemical companies hired Professor Maltoni to conduct the aforementioned experiments. As noted, in 1972 he produced malignancies in animals which were exposed to 250 ppm of vinyl chloride. In January 1973, this information was passed on to the Manufacturing Chemists Association in the U.S., with the request it be kept confidential until Professor Maltoni had the chance to further analyze and interpret his studies. The ban was lifted in July 1973 and the report on Dr. Maltoni's experiments was transmitted by the Manufacturing Chemists Association to NIOSH and other government agencies.

Incidentally, nothing was done about Professor Maltoni's findings. The Labor Department claims, in retrospect, that it didn't get the complete report; the MCA insists that the government did receive the data, but failed to comprehend its significance. In any event, Washington agencies made no effort to change the standards of exposure that OSHA had decreed for the industry in 1971—namely, 500 parts per million particles—double the level at which Dr. Maltoni produced liver cancer in his test animals. Meanwhile, Great Britain and Germany had tightened up their exposure levels. In the U.S., Dow Chemical had been raising its standards over the years, and Goodrich, whose subsequent announcement of fatalities was to touch off the storm, by the middle of 1973 had upgraded its exposure goal considerably above that of OSHA.

The disclosure that Washington and the MCA had known about the cancer-producing danger of vinyl chloride months before the Goodrich deaths sparked a public furor. A Nashville newspaper ran a series

Arguing that they are being asked to adhere to standards that are technically impossible and economically unfeasible, the PVC producers are taking their case to court.

cially in the 'Thirties and, thanks to its fire resistance and ability to be molded into a wide range of forms, was dubbed a "wonder plastic," which went into hundreds of industrial and household products. Last year, nine firms produced vinyl chloride gas in 14 plants. Their output was used by 21 companies to turn out over five billion pounds of polyvinyl resin, in 37 plants. The leading producer is B. F. Goodrich, followed by Firestone, Conoco, Union Carbide, Borden, Diamond Shamrock, Robintech, Tenneco, Air Products, Goodyear and Hooker (division of Occidental Petroleum).

Vinyl chloride had not been considered a seriously hazardous chemical. However, in the process of conversion from gas to resin, there is substantial leakage and the chief worry has been of plant explosions. The gas can induce narcosis (sleep). In fact, it was once tried out as an anesthetic but was discarded, since it caused heart irritation. During the 'Sixties, in cleaning out the vats during the conversion process, incidences of acro-osteolysis (bone and skin disease) cropped up among workers, and VCM processors introduced new techniques to reduce exposure. To further protect workers, OSHA, which was established in 1970 under the industrial health safety act, set limits of 500 parts per million of the chemical, to which workers could be exposed in gas and resin plants.

Matters were thought to be under control until the tragedies at the aforementioned Goodrich plant. Last

turbed, Goodrich management reported the deaths to officials of the National Institute for Occupational Safety & Health (NIOSH). After intensive consultation, the news was made public on January 22, 1974.

The announcement hit the industry like a bombshell. William Lloyd, director of health surveillance for NIOSH, declared, "This has to be one of the most startling findings ever in industrial medicine." Government health officials immediately launched a nationwide investigation. Staff members of NIOSH and OSHA went to polyvinyl chemical plants all over the country to study the situation. Charging that "workers are tired of being guinea pigs," officials of the United Rubber Workers and the Oil, Chemical & Atomic Energy Workers, demanded that PVC producers eliminate the exposure hazards or shut down.

### Health Crusader

In addition, they asked Dr. Irving J. Selikoff, director of Mt. Sinai Hospital's Environmental Sciences Laboratory, to undertake medical investigations on their behalf. Over the years, Dr. Selikoff has built a reputation as a crusader for improved safety conditions in industry. A highly articulate spokesman, and a consultant to the AFL-CIO, the doctor is known as the Ralph Nader of the industrial health field. He pitched in vigorously. Assisted by labor personnel, he began digging into the health records at producers' plants.

Then the industry suffered an-

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