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A Danger for Workers in the Plastics Industry

Since 1970 a number of deaths due to cancer of the liver have been noted among workers employed in the industries producing polyvinyl chloride (PVC), an important raw material used in the manufacture of plastic products. Currently the PVC industry employs 30 000 persons in Europe, is second in plastic materials production and is expanding rapidly at the rate of 10% per annum. In 1973 the Community produced over 3 million tons of PVC, used mostly in the manufacture of tubes and pipes (27% of which of PVC production), electric cables (10%), flooring and building structures (16%), clothing and shoes (9%), wrapping foil and plastic bottles (16%).

PVC is made from a particularly toxic heavy gas, vinyl chloride which during processing must be kept under pressure in an autoclave, a kind of large hermetically sealed "cooker". It was mainly workers responsible for cleaning these vats who succumbed to cancer of the liver (up to the present, there have been 25 deaths, 14 of them in the United States). The toxicity of the product has now been established and there is no doubt about the cause and effect relationship. Since this discovery in 1970, precautions have been taken in the industry to reduce exposure levels considerably (concentrations have been reduced from several thousand to some hundred parts per million (ppm)).

It is in the PVC production industries therefore that workers may be exposed to hazards, whereas in the processing industries (where plastic products are made from PVC), hardly any of the toxic gas is left and there is no risk to workers.

At the consumer stage, i.e., where products made from PVC are used (and the first use that springs to mind is plastic packaging for food products), the residual dose of the toxic gas is no more than a few thousandths of a ppm and therefore presents no problem. PVC toxicity is thus an industrial medicine matter. For this

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reason the European Commission arranged a seminar on 17 and 18 September for some hundred medical specialists in occupational diseases. Opening the seminar, Mr Shanks, a Director-General of the European Commission, reminded his listeners that one of the aims of the Community's social policy was to protect workers at their place of work. In the case of workers in PVC factories, the question of prevention was primary, and exposure levels must be defined which did not endanger health. Their strict determination was made all the more imperative since the possible damage to the human organism only became apparent long after exposure (10 years or so).

Following two days of discussion and exchange of information, those taking part in the seminar stressed a number of ideas and principles which should be regarded as guidelines for the action to be taken in this field:

- (1) Substitution of a non-toxic product for PVC might be considered eventually but this would mean long delays and lead to serious disruption in industries where PVC is a key-factor.
- (2) PVC production must be carried out under improved conditions. The considerable efforts already undertaken by the industries over recent years show the problem to be a technological one, which can be satisfactorily solved although it would appear that no "zero exposure" is practicable.
- (3) The concept of a permissible dosage led to controversy between some participants. It is possible, nevertheless, to define an incidence level which is "humanly" perceptible: figures of 10 to 25 ppm were put forward, and one ppm (i.e., zero) was suggested by some participants.
- (4) Permanent and extremely strict supervision must be introduced for jobs involving exposure, and the workers concerned must be individually monitored from the biological point of view.
- (5) Any information on epidemiology available in various countries, particularly the United States, should be used in determining the parameters which will lead to the best possible medical prevention.

As a result of the seminar's findings, the European Commission will make every effort to encourage the exchange of information, and coordination between specialists in different countries, so that prevention methods may be improved.

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