

Vinyl chloride

processing/finishing by-products, and some of the emission regulations that will be published as part of the law may be no more severe than the consensus standards that already exist. For hundreds of such items, safe exposure levels have been established that are based on threshold limit values (simply, a parts-per-million dispersion in ambient atmosphere that is deemed innocuous to workers for up to 8 hr.), and are presently acceptable to the Occupational Safety & Health Administration, which promulgates the law's standards.

However, the wish could be father to the thought where the actual impact of future OSHA health regulations are concerned. Last April 21 was the cutoff date for OSHA acceptance of industry consensus standards. Any new ones, which will involve some important plastics raw materials and by-products (see table, p. 57), will have to be developed through the rigorous procedures—including intensive research and review—established by the National Institute for Occupational Safety & Health (NIOSH). And NIOSH, whose charter excludes any concern for economic outfalls, is obligated to press for the closest possible control of hazardous materials; even for review of many "prior sanction" substances whose threshold limit values have been published by the American Conference of Government Industrial Hygienists (ACGIH), and thus are presumed to be safe in normal plant environments.

A thought to ponder: Dr. Charles Powell, director of the NIOSH Office of Research and Standards, estimates that perhaps half of ACGIH's threshold limit values are based on inadequate documentation; in any case, he points out, they are suggested guidelines rather than firm standards.

The NIOSH timetable

Essentially, NIOSH (which is an arm of the Dept. of Health, Education & Welfare, and operates independently of OSHA, which is under the Dept. of Labor) is charged with conducting or contracting for research to develop scientifically sound data leading to the development of recommended OSHA standards. These Criteria Documents, as they are called, then go to the Dept. of Labor for review, revision if necessary, and promulgation as OSHA standards.

NIOSH currently has a backlog of nearly 500 chemicals and agents for which it plans to develop Criteria Documents. Four that affect the plastics industry (on benzidine, ethyleneimine, job-environment heat stress, and ultraviolet radiation) already have been sent to the Dept. of Labor in 1973. And NIOSH has plotted a "worst-first" priority list for the development of additional Criteria Documents to be worked on beginning this year.

Priorities are assigned on the bases of the number of U.S. workers exposed to the material, the likelihood of contracting a disease from exposure, and the severity of the disease. As indicated in the accompanying table, the list includes a wide variety of plastic monomers, chemicals, additives, and fillers—with health-hazard potentials that range from simple irritation to cancer.

NIOSH emphasizes, however, that this is not to be construed as a "blacklist." It observes that many items are on the list merely because there hasn't been enough research at any level to establish safe threshold limit values for workers exposed at the resin-making, compounding, processing, finishing, and secondary finishing stages. That

work remains to be done. And NIOSH concedes that it can use all the help it can get, including information and assistance from industry. In fact, any company that has research data to contribute, or that has a question on standards development, is invited to contact NIOSH at its headquarters address (5600 Fishers Lane, Rockville, Md. 20852), or at any of its 10 regional offices.

Shadows of a problem

Even assuming that the vast majority of NIOSH/OSHA standards on plastics-related materials will cause no major disruptions at any level of the industry (and the details of such forthcoming standards remain a matter of speculation), the sheer weight of numbers makes it apparent that new controls and compliance procedures will be instituted for some items on the priority list.

At the least, there are questions that remain to be answered. For example, at a recent OSHA conference in New York City, Professor Sidney Laskin of the Department of Environmental Medicine at New York University reported that epidemiological experiments on laboratory animals reveal significant respiratory deterioration after long-term exposure to 0.02 parts per million of toluene diisocyanate (a urethane-foam building block). This p.p.m. level is rated as acceptable for human exposure by ACGIH. Professor Laskin also noted that, in a concentrated follow-up test, 20% of a sample of rats exposed to dust abraded from a construction-grade foam block developed emphysema.

Similar "scare stories" can be told for other materials—such as vinyl chloride, which has a threshold limit value of 200 p.p.m. Recent animal studies conducted in Italy (at an elevated exposure level of 3000 p.p.m.) resulted in a disproportionate incidence of skin and organ cancers, and has led to a current U.S. study of the potential hazards of vinyl chloride, by the Manufacturing Chemists Assn. And now, in a related move, the Food and Drug Administration has put a hold on the use of PVC liquor bottles, pending a study of the effects of monomer migration.

The asbestos question

So far, the only measurable impact that an OSHA standard can have on materials used by the plastics industry relates to the limits on asbestos exposure. The standard permits a maximum of 5 fibers/cc. of air, which is to be reduced to 2 fibers/cc. by July 1, 1976; down from the 12-fiber threshold limit value originally set by ACGIH.

There was some concern that this standard would severely restrict the market for asbestos—and General Electric in fact has eliminated asbestos filler from its phenolic lines, substituting an FDA-acceptable material (see Dec. 1972 MP, p. 48). However, consumption of asbestos fibers in the U.S. actually increased by 7% last year, according to the Bureau of Mines of the Dept. of the Interior.

Still, there are economic penalties. Raybestos-Manhattan estimates that the asbestos industry has spent \$100 million over the past decade to implement dust-control programs, and will spend a like amount just to meet the OSHA standard. This does not include the worker-safety compliance costs (for special safety garb, protective devices, physical examinations, etc.) incurred by plastics plants and other factories that handle asbestos routinely.

One way out of OSHA's asbestos bind is via the develop-

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