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Industrial Hygienist - RE Asbestos Incorporated Into Plastic Material

June 16, 1972

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ASBESTOS INCORPORATED INTO PLASTIC MATERIAL

E. N. Epstein and J. F. Armitage, Plastics Department, Experimental Station met with J. A. Zapp, C. F. Reinhardt, P. D. Griffith, C. W. Eddy, and R. J. Rubiak on June 12, 1972 to discuss potential hazards arising out of the proposed use of incorporating asbestos into polyesters and nylon.

Presently Du Pont markets a glass-reinforced nylon while other manufacturers are marketing a nylon incorporating approximately 20% asbestos. The intended use of asbestos in polyesters would be a new endeavor.

The flow through the manufacturing procedure would be as follows:

Polymer pellets, silane (coupling agent) and asbestos would be mixed in an enclosed unit or a hood. This mixture would then be added to the hopper of an extruder. The material would be heated, extruded, chopped into pellets, and bagged. This would be the extent of in-plant handling.

The customer would dump the product into the hopper of a molding or extrusion machine. At the end of the process would be a finished part. Finished to the extent that the only additional work on it would be to remove the excess lead-in plastic material to the molded part. One main object of this type of molding is to eliminate excessive machining on the part. There should be no grinding or sanding of the part.

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June 16, 1972

The potential hazards are:

- 1) Adding of the asbestos in with the polymer pellets and silane.

Dust would be generated. This operation could be carried out in a hood during small trial tests. For larger batches, a mixing unit with good local exhaust should be designed to control the dust. The operator should wear U.S. Bureau of Mines approved respiratory protection as he transfers the asbestos from the drum or bag to the mixer. The U.S.B.M. approval number 21-B will probably suffice for this type of asbestos exposure. Miss Constance Eddy suggested having the supplier (Union Carbide) send the material pre-weighed in polymer bags. In this way the bags could be added in-toto to the mix to become a part of it. This could eliminate part of this one dusty step.

- 2) Adding the polymer-asbestos mixture to the hopper of the extruder.

This operation is enclosed and exhausted. There may be some dusting on the initial adding of the mixture to the hopper. If the present exhaust design does not control this dust release, respiratory protection of the type mentioned above should be required.

- 3) Pelletizing of the polymer containing asbestos.

Dust may be generated at this step. Presently there is no exhaust at this point but it will be added if necessary. It was mentioned that air samples may be taken at this location to determine the degree of dustiness. There may be some loose fibers but the particles collected will more likely be of the polymer and asbestos integrally combined. If these particles so released are of a size that can be inhaled and deposited in the lung, the asbestos fibers at the surface of the particle may exert their disease-producing mechanism. By measuring the amount of dust at this stage of development, along with locating the source of dust release, the best means of dust control can be accomplished prior to full project development.

- 4) Chopping of waste plastic material.

This is probably more of a noise problem than a dusting problem. Mention was made that full enclosures are recommended for the control of the noise generated. Observations should be made of these units to determine if there is dust generated, and if so, to what degree. The dust, if generated, should be similar to that found at the pelletizing operation. The procedure for cleaning the chopper may require further consideration. Dust may be deposited within the noise enclosure and require

DUP 004769

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June 16, 1972

brushing and vacuuming of the deposits at periodic intervals. Respiratory protection at this time may be necessary. If enough dust was generated to warrant local exhaust ventilation, proper noise insulation would also be required on the system.

5) Release of fibers from finished part.

The intended use of these products, as indicated in this meeting, should not pose a hazard to the end-users. The fibers are essentially bound into the product and the products are not of the type, like brake-linings or insulation, where other factors contribute to the release of fibers from the product. If at some future date, a product was contemplated where it was possible for the fibers to be released into the atmosphere, a review of the situation would be warranted.

If further questions arise or assistance is needed on the control of the dust at the various operations, do not hesitate to call.

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