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late Dielectric Phthalate

GE COMES UP WITH ITS OWN PCB'S SUBSTITUTE

Electrical equipment companies are bidding to become their own biggest suppliers of substitutes for polychlorinated biphenyls (PCB's). These substitutes are being developed to replace environmentally troubled PCB's in dielectric insulating fluids in capacitors, the largest remaining use area for these fluids.

Last week General Electric introduced a line of non-PCB fluids, tradenamed Dielektrol, for small component and larger power capacitors. The company has developed a phthalate ester-based formulation that it says not only virtually eliminates environmental risk but outperforms the old PCB's except in fire resistance.

GE will convert its capacitor production completely to Dielektrol fluids by June 30. Currently the company has Dielektrol production capacity of about 10 million tons per year at Hudson Falls, N.Y. This is about double what GE will need for its own use. The company will sell Dielektrol at prices about competitive with PCB's and also will offer to license other companies to produce it.

Dielektrol is based on dioctyl phthalate, a commercial organic chemical used up to now as a plasticizer. GE purposely picked a commercial chemical freely available with a considerable research literature. In its own and contract laboratories' tests to date on acute toxicity, GE finds no significant hazard. The company also finds that the new fluid does not persist or accumulate in the environment. For example, GE says that in tests by Bionomics, Wareham, Mass., on bioaccumulation of carbon-14-tagged Dielektrol in fish tissue, accumulation of fluid was 500 times lower than that of PCB's.

Longer-term tests on chronic toxicity are still going on. Preliminary results are favorable.

It was the accumulation of PCB's effluents in the food chain that got PCB's into trouble in the early 1970's. At that time, U.S. use of these fluids was cut in half to about 40 million lb per year restricted to electrical equipment insulation. The sole current U.S. producer is Monsanto, which plans to get out of this business by the end of October 1977.

GE has dealt with a combustible property in its new fluid by fitting all capacitors with a fail-safe system. This system disconnects capacitor terminals from the power source in the event of buildup of internal pressure in a fire.

GE's introduction of Dielektrol follows a similar switch to a non-PCB capacitor fluid by Westinghouse last fall (C&EN, Nov. 15, 1976, page 25). The basic chemical in Westinghouse's new capacitor fluid is isopropylbiphenyl. Still another fluid has been adopted by Sprague Electric.

These new fluids from electrical equipment companies may displace a large part of what has been a chemical company market. Monsanto itself has dropped out of the PCB substitute race after evaluating a number of compounds.

Dow Chemical is doubling capacity at Midland, Mich., by midyear to produce its own PCB's substitute based on alkylated chlorodiphenyl oxide. Dow's fluid currently is used in capacitors by McGraw-Edison.

Yet another PCB's substitute for capacitors is being offered by Exxon Chemical. Exxon's candidate is diisononyl phthalate (DINP), similar in properties and price to dioctyl phthalate but with a slightly higher flash point. □



Technician fills GE power capacitors with newly developed Dielektrol fluid

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