January 26, 1971

Mr. D. J. Flynn
General Motors Corporation
Chevrolet Saginaw Foundries
10th Street at N. Washington
Saginaw, Michigan 48601

Dear Mr. Flynn:

Mr. Fague of our Detroit Office has asked me to comment in connection with the use of Pydraul fluids and the possible hazard of these fluids at elevated temperatures.

First, I would like to say that we have manufactured these products for over 40 years and the chlorinated components are used in a multitude of applications as hydraulic fluids, heat transfer media and as high temperature additives in products for many uses. In all of these years of manufacture we have never heard of a single case of where phosgene has been a problem nor would we expect such a situation based on data we have available to us.

As you know the American Conference of Governmental Industrial Hygienists (ACGIH) publishes yearly a list of Threshold Limit Values (TLV) for worker exposure. These values have been largely accepted under the Walsh-Healey Act and will probably be accepted under the new Federal Health and Safety Act. We have stated in our bulletins and in our other discussions with customers using Aroclor containing materials that workers exposed to these products containing chlorinated biphenyl should not be exposed to levels in excess of 0.5 milligrams per cubic meter of air (mg/m^3) in the case of Aroclor 1254 and 1.0 mg/m^3 for Aroclor 1242.

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In the early 1950's we had the Kettering Laboratory at the University of Cincinnati perform some decomposition experiments utilizing one of these Aroclors. The decomposition products of interest were the Aroclor itself, hydrogen chloride and phosgene. The ACGIH TLV for these products are 0.5 to 1.0 mg/m^3 for Aroclor itself, 7.0 mg/m^3 for hydrogen chloride and 0.4 mg/m3 for phosgene. The Aroclor in question was subjected to temperatures ranging from 1049 to 1053°F in an inconel furnace.

The results of the Kettering Laboratory tests show that the phosgene concentration was 1/6200 of the Aroclor evolved and 1/64 of the hydrogen chloride evolved.

In September, 1934 and again in September, 1961 we had these products tested by the Underwriters Laboratories, Inc., National Board of Fire Underwriters. The results of these tests where three different Aroclor mixtures were heated to 1115°F in an iron furnace showed no phosgene in any of the tests conducted. These tests on decomposition products were specifically for phosgene, free chlorine (none in this case also), carbon dioxide, carbon monoxide, oxygen and several others. These data indicate that control methods necessary for the control of Aroclors themselves or hydrogen chloride will obviously control any phosgene (if there is any) produced.

In respect to the decomposition problems that might arise from products of this kind, I would like to quote from the Underwriters Laboratory report dated September 5, 1961:

> "In the decomposition temperature tests, the products did not undergo appreciable decomposition at temperatures below 300°C (572°F). Considerations of the chemical composition and properties of the products also indicate that they are reasonably stable".

For these reasons we feel that there is no phosgene hazard connected with the use of Aroclor containing Pydraul fluids. Our 40 years of experience with these products has proven this to be correct.

Sincerely,

Jack T. Garrett
Manager, Industrial Hygiene
Medical Department

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