Monsanto

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MONSANTO INDUSTRIAL CHEMICALS CO.
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St. Louis, Missouri 63167
Phone: (314) 694-1000

June 10, 1983

Mr. Mike Phillips
U.S. EPA TS-794
East Tower
401 M ST SW
Washington, DC 20460

Dear Mike:

Attached is the general information relating to Monsanto's PCB replacement products in the heat transfer and hydraulic fluid areas.

Therminol® is Monsanto's trademark for heat transfer fluids. In the past (prior to 1971) only the Therminol® FR Series of products contained PCBs. Current Therminol® fluids such as listed in Table 1 and the attached product bulletin are generally organic hydrocarbon compounds containing only carbon and hydrogen atoms. No chlorine is present in the molecules. The exception to this generic product description are two Therminol® fluids that also contain oxygen atoms on either ester or ether linkages

Pydraul® is Monsanto's trademark for hydraulic fluids. Since 1971, Pydraul® hydraulic fluids have not contained any PCBs in any formulation. Table 2 and the attached Pydraul® product bulletin give a general description of alternatives to PCB hydraulic fluids.

In addition to technical properties of the Monsanto Therminol® and Pydraul® fluids the technical bulletins give information related to toxicity safety and handling and other general information of interest to uses.

If you need more specific information please let me know.

Sincerely,

John H. Craddock

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attachments

bcc: A. A. Johnson
K. E. Rosenberg

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TABLE 1

THERMINOL® FLUIDS

Product	Generic Chemical Description	Operating Range	Flash Point
1. Therminol® 44	Modified Ester	-50°F-425°F	405°F
2. Therminol® 55	Synthetic Hydrocarbon	0°F-600°F	355°F
3. Therminol® 60	Polyaromatic Compound	-60°F-600°F	310°F
4. Therminol® 66	Partially Hydrogenated Terphenyl	18°F-650°F	355°F
5. Therminol® 88	Mixed Terphenyls	293°F-750°F	375°F
6. Therminal® VP-1	Eutectic Blend of Diphenyl Oxide and Biphenyl	56°F-750°F	255°F

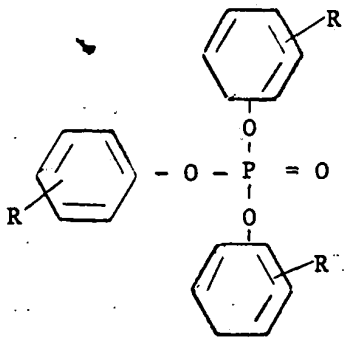
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TABLE 2

ALTERNATIVES TO PCB FIRE RESISTANT HYDRAULIC FLUIDS

1. Phosphate Esters



R may be C_{o-10}

Monsanto phosphate esters used in industrial hydraulic fluids include mixtures of:

nonyl phenyl, para cumyl phenyl, phenyl phosphates

tertiary butyl phenyl, phenyl phosphates

2-ethylhexyl, phenyl phosphates

2. Water/Glycol Solutions

3. Water/Oil Emulsions

It is estimated water gylcols are the major volume fluids used (9M gals), or 44% of all synthetic hydraulic fluids. Phosphate esters are less than 30% of total volume.

M equals millions.

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