November 24, 1965

Mr. Clayton Kellar
Honeywell Ordinance Division
Building 103
New Brighton, Minnesota

Dear Mr. Kellar:

Confirming our telephone conversation, I am forwarding information relative to the toxicity and safe handling of our fire resistant hydraulic fluid, Pydraul 312.

This is a new member of our Pydraul series and consists of chlorinated biphenyl, a phosphate ester, and a high viscosity selected petroleum fraction of low volatility. Our label for this product contains the following precautionary statement:

> CAUTION!
> Contains Chlorinated Hydrocarbons.
>
> Avoid prolonged breathing of vapors or mists.
> Avoid contact with eyes or prolonged contact with skin
> If skin contact occurs, remove by washing with soap and water. Following eye contact flush with water.
> If clothing becomes soaked with fluid, launder before wearing again.

Experience with this and other members of the Pydraul series indicates that these fluids should be used in systems as free from leaks as possible. This is particularly important if the fluid is at elevated temperature where components of the formulation may be volatilized into the workroom. At ambient temperature the vapor pressures are such that there are no significant vapor inhalation hazards.

If there is accidental spraying of Pydraul 312 into molten metal or on heated surfaces, the fluid will be vaporized and/or decomposed depending on the temperature of the metal.

MONS 090927

About 15 years ago we had rather extensive tests run at Kettering Laboratories at the University of Cincinnati where a Pydraul fluid was sprayed on metal heated to 1050°F and 1250°F. The vaporized fluid and decomposition products were discharged into suitable animal exposure chambers. Similar experiments were run with a triorcayl phosphate hydraulic fluid and a petroleum based fluid. The general conclusion reached was that there was little difference, from a practical standpoint, in the toxicity of the three products as demonstrated in the experiments.

If a phosphate ester fluid or Pydraul is sprayed into molten metal as a result of the rupture of a hydraulic line on a diecasting machine, a cloud of acrid vapor and smoke will develop. This will consist principally of soot, CO, CO_2, water, aldehydes and cresols. In the case of Pydraul, there will be in addition hydrochloric acid in the smoke due to the decomposition of the chlorinated compound. This may make the "cloud" somewhat more acrid or irritating but does not significantly increase the toxicity.

Where the Pydraols have been involved in such accidents, there have not been cases where employees could not safely shut down equipment and leave the area. As with a phosphate based fluid, it might or might not be necessary to wear respiratory protection to re-enter the area until it could be ventilated. This would depend, of course, on the amount of fluid that was sprayed or leaked onto the molten metal or hot surface.

Our label recommends avoidance of repeated and prolonged skin contact. This precaution is indicated since Pydraul 312 is an excellent solvent for the natural fats and oils on the skin. When these are removed the skin may tend to dry and crack. The fluid works much like many common paint thinners in this respect.

If I can be of any additional help, please do not hesitate to let me know.

Very truly yours,

Elmer P. Wheeler
Manager, Environmental Health
Medical Department

EPW:mjb

cc: James Beal - Honeywell, Hopkins, Minn.
Dave Hosmer - Monsanto, Chgo

MONS 090928

Beal add - Honeywell Corp, 600 - 2nd St. N, Hopkins, Minn