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April - 1955

Chief
Bureau of Ships
U. S. Navy
Washington 25, D. C.

ATTENTION: CODE 342

Dear Sir:

We have been asked to furnish your office with data concerning the composition of our product Pydraul 150 and any pertinent toxicity data. The material contained herein is to be regarded as "Commercially Discreet for Official Use Only."

70-141
Pydraul 150 is a mixture of an alkyl aryl phosphate ester, chlorinated biphenyl, and an acrylic type viscosity index improver. The following toxicity information has been provided by our Medical Department: 23-A42

"The alkyl aryl phosphate ester, which constitutes the greater portion of the formulation, has undergone extensive toxicological investigation. A summary of the results obtained indicates that the Minimum Lethal Dose for this component is greater than 24 grams per kilogram of body weight. Animals fed single doses ranging from 0.18 to 24.0 g/kg showed no signs of intoxication other than a transient mild diarrhea associated with the larger doses. Only transient small weight losses in some animals were observed and all animals grew normally after regaining the original loss. Rats fed this material as 1 per cent of their diet over a 2-year period showed no relevant pathological changes or tissue changes. At this level there was some retardation in growth but no similar effect was noted in a group of animals fed for the same period, amounts up to .125 per cent of the diet. Dogs fed the material at the rate of 2.5 per cent of the food ingested over a 2-year period grew at retarded rates but without any signs of intoxication. Dogs fed 0.5 milliliters of the material per kilogram, 6 days a week for 26 weeks, grew normally and survived without any untoward effects. In no cases were there any microscopic abnormalities or tissue changes in the dogs at either level.

"Five milliliters per day were taken internally on each of 15 consecutive days by a human subject with no significant effects. In the case of this man and other volunteers who ingested a similar dose for a shorter period, it was determined that approximately 90 per cent of the original material ingested was found unchanged in the excreta. Ad-

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ditional metabolic studies indicated that the alkyl aryl phosphate ester is excreted unchanged or as various, apparently non-toxic, derivatives of phenol.

"Rats have survived a 7-hour exposure to an atmosphere saturated with vapors of this phosphate ester. Skin patch tests with 200 human subjects indicated that the compound is not a primary irritant or a skin sensitizer.

"In the case of the chlorinated biphenyl, animal toxicity studies indicate that the oral lethal dose for rats is approximately 4.5 grams per kilogram of body weight. In vapor exposure experiments, laboratory animals tolerated without significant effects, 150 days exposure, 7 hours per day, over a period of 214 days, an atmosphere containing approximately 2 milligrams per cubic meter of air. Although patch tests with human subjects have not been done with this particular chlorinated biphenyl, we have no record of dermatitis, chloracne, or any other skin effect ever having occurred in our own plants or in the plants of our customers where the material has been encountered for more than twenty years. The reports in the medical literature referring to possible skin effects following exposure to chlorinated biphenyls, relate to the use of the chlorinated diphenyls in conjunction with other known chloracne-producing chlorinated hydrocarbons.

"It is our opinion that Pydraul 150 can be handled and used with no more precaution than is afforded other hydraulic fluids insofar as toxicity considerations are concerned."

Very truly yours,

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