

St. Louis

April 10, 1956

Dr. R. E. Kelly

MAIN OFFICE - 2

HYDRAULIC FLUID DISCUSSION  
WITH CAPTAIN STONE - U. S. NAVY

The Navy is currently interested in only two of our hydraulic fluids. These are:-

1) Hydraul 150

This fluid is currently being used in one submarine. In August of last year we provided the Bureau of Medicine with statements on our toxicity work and our opinions as to any possible hazards in the use of this fluid. The same information had been furnished the Bureau of Ships several months earlier. At the time the data was sent to Dr. Stone, it was sent to Dr. Hodge and was followed up by a letter from Dr. Trean that our opinions and conclusions were sound. The composition (confidential) of 150 is 70-141, 23-A42, and 7-V.I.I.

In November of last year we were informed that a sample of this fluid had been sent to Dr. Lehman for investigation, allegedly clinical. We have been unable to learn what work Lehman did and what results he obtained. Presumably the Navy decided to test use this fluid in spite of lack of approval by the Bureau of Medicine. To date we have not heard of any difficulties encountered in submarine use.

The attached correspondence does relate a case of skin irritation allegedly due to this fluid in a dock-side mark-up of the system in which the fluid was to be used. The single case of skin irritation may have been due to other factors such as poison ivy. The Navy and the Portsmouth Navy Yard agreed that this might be the case.

Also during the mark-up trials an engineer had a stream of the fluid under pressure sprayed into his mouth when a line ruptured. Except for a sore throat for perhaps up to two weeks, there were no other reported symptoms.

I plan to discuss more fully (yet within the limits of the confidential nature of the subject) the composition of 150 with Harold Hodge and Norton Nelson at the time of the Philadelphia meeting. I do not believe that any of the Navy people nor their consultants have been told that 150 contains no TCF. Litzinger has told me that we certainly can emphasize this point.

MONS 095628

April 10, 1956

2) OS-70 (fluid TAP)

This is the fluid currently of interest for use aboard aircraft carriers and is similar to the Celanese product, Cellulube 220. We do not know the composition of our phosphate esters made from the cresols and xylanols in the raw material. We do know that the percentage of TOCP in the OS-70 will be considerably less than in our plasticizer-grade TCP. Further, the amounts of meta and para cresol phosphate should be considerably less since the raw material contains only 30 percent cresols to begin with (this figure is currently to be considered confidential). The other 70 percent of the raw material is made up of xylanols and should produce a triaryl phosphate high in the many possible isomers of the so-called TAP or triaryl phosphate. There is attached a copy of the acute toxicity data on OS-70. This is to be repeated and extended in the work currently underway at Kettering. Our project there includes the following:

- a. Determine the MLD or LD<sub>50</sub> (whichever you think appropriate) in one dose by stomach tube to rabbits, rats, chickens, and cats.
- b. Determine the minimum lethal dosage when maintained upon the intact and unbranded skin of immobilized rabbits in rubber cuffs for twenty-four hours.
- c. Determine the acute toxicity of the mist when inhaled by groups of animals for periods ranging from one to seven hours.
- d. Cholinesterase inhibition measurements on rabbits following repeated skin application and possibly following repeated exposures to mist. We haven't made definite commitments to Trean as to how much of this he should undertake.

The Navy and their consultants have asked us for a statement on our manufacturing experience with this fluid. Since we have not even produced pilot plant quantities of this material, we obviously have no plant experience to report. On the other hand, we have 20-30 years experience in the production and handling of a tricresyl phosphate containing more tricresyl phosphate than will be present in OS-70. As you know, this experience has been completely without any untoward incidents.

All of the acute toxicity data on the xylanol phosphates indicate a lower order of toxicity than with the cresyl isomers. It is true that we do not know whether there is a wide variation in the toxicity of the different xylanol isomers (as there is in the TCP isomers) but this does not appear to be too important in view of the indicated low order of toxicity of the

Dr. R. E. Kelly

- 3 -

April 10, 1956

xylenol phosphates as a group.

We should have available soon after the first of June Treon's report on our fluid. These we will be happy to send to Dr. Shone as soon as available. The only other point I think you will want to consider specifically with him is the value of a letter from us discussing our experience with TCP and trying to relate this to possible experience with TAP.

Elmer P. Wheeler

EPW:aw

Attachments

MONS 095630