BCC Dale Smith - GO

December 22, 1959

Mr. Emmert M. Baxter
The Budd Company
2450 Hunting Park Avenue
Philadelphia 32, Pennsylvania

Dear Emmert:

One of our technical service representatives has told me that he discussed Pydraul A-200 with representatives of your company last week. I believe his visit was in connection with reported pump failures.

In the course of the discussion, the question of toxicity of Pydraul A-200 vapors was raised and our representative was given the impression that your people believed that this fluid would decompose at a temperature of approximately 150°F. and further, that the decomposition products would be poisonous. I wonder if what I told you about Pydraul A-200 in Trenton on December 4 might have been misleading.

In brief, I said that we certainly would not recommend the use of Pydraul A-200 (or Pydraul F-9) in such a fashion that mist might be present in the working environment. Further, it is our recommendation that in any application where the fluid is heated above 150°F. in open tanks or containers (not in a closed hydraulic system), mechanical exhaust ventilation be provided to remove vapors of the fluid components. These vapors are not decomposition products because the fluid will not decompose until temperatures above 400-500°F. are reached.

In limited studies to determine the acute toxicity of decomposition products, we have exposed rats to a moderately heavy concentration of fluid volatilized by allowing the fluid to drop onto a heated surface at 1000°F. The concentration of the fog was sufficient to partially obscure the animals at a depth of six inches within the chamber. The animals at the rear of the chamber (a depth of eighteen to twenty-four inches) were all but completely obscured. Eight rats survived 5 one-hour exposures spread

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over a period of two weeks. The animals demonstrated nasal discharge, salivation, lethargy and moderate weakness. The fog caused considerable inflammation and discomfort but the cumulative effect was not lethal.

In a second experiment, eight rats were exposed for 15 minutes to as heavy a concentration as could be obtained again by dropping the fluid onto the metal surface heated to 1000°F. In this case, the animals in the front of the chamber were nearly obscured; those at a depth of six inches were completely obscured. The only observable effect on the animals was apparent irritation. All survived.

In a third experiment, eight additional rats were exposed to a similar heavy concentration for one hour. In this case the animals demonstrated lethargy, reduced, shallow and irregular breathing, nasal and oral discharge and lacrimation. Within fifteen to forty-five minutes after the completion of the exposure, the animals returned to normal except for the breathing rate and survived, showing normal weight gains during the two-week observation period.

These data indicate to us that the decomposition products formed when the fluid contacts metal heated to 1000°F. are not "poisonous". This obviously is a relative term with various meanings to any given number of individuals. We conclude that the decomposition products do show a degree of toxicity and we certainly would not recommend massive short-term exposures nor repeated or prolonged exposures to lesser concentrations. From a practical standpoint, however, it is our feeling that workmen would not voluntarily subject themselves to the irritating gases and vapors which are produced when the fluid is decomposed. It appears that exposure to the decomposition products should occur only as the result of an accident. In the case of such an accident, workmen would not be incapacitated to the degree that they would be unable to shut down the equipment and leave the area.

Any concern which we have regarding exposures when the fluid is heated above 150°F. (but below decomposition temperatures) is related to the possible chronic toxicity of the fluid vapors per se. If the fluid is used in closed hydraulic systems as intended, there should be no vapor exposure hazard.



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Enclosed are several pieces of literature which may be of interest. The Pydraul F-9 technical bulletin contains a summary of toxicity information on page 18. Included with the bulletin is a mimeographed sheet which is somewhat more comprehensive. In the case of Pydraul A-200, the oral $LD_{50}$ in rats is 10,500 milligrams per kilogram, a figure which indicates to us that accidental ingestion is not a particular hazard. Simiarly, single massive skin exposures should not be immediately hazardous since the skin penetration minimum lethal dose in the case of rabbits is 625 to 1,250 milligrams per kilogram. This latter figure does indicate, however, that prolonged and repeated skin contact should be avoided. Further, skin exposure should be avoided to prevent possible skin irritation. In eye irritation studies with animals, the numerical scores indicate that Pydraul A-200 may be considered a mild eye irritant. Animal studies, however, do not reflect the degree of pain which has been reported when workmen have splashed the fluid in their eyes or rubber their eyes with fluid on their hands. In such cases in humans, however, the eye irritation has not been notably severe nor has there been any impairment of vision.

If I can be of any further assistance, please let me know.

Sincerely,

Elmer P. Wheeler
Assistant Director
Medical Department

EPW:dh
Enclosures 2

cc Dr. D. H. Pershing
Medical Director
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