bcc: AG Eades
GR Buchanan
2nd Street - Don Roush
DETROIT - JG Hicks
CHICAGO - DL Hosmer

June 7, 1965

Mr. F. Vaclavik, Project Engineer
Parke, Davis & Company
182 Howard Street
Holland, Michigan

Dear Mr. Vaclavik:

Here is the analysis result of your recent sample of THERMINOL FR-2:

PROPERTY	SAMPLE	NEW THERMINOL FR-2
Moisture ppm	210	50 max.
Viscosity @ 100°F, centipoise	99	75 max.
Acid Number mgKOH/gm	0.9	0.01 max.

Aside from the elevated viscosity which indicates some thermal degradation of the fluid, the most significant number is the high moisture content of the sample. High moisture in the system can cause fluid breakdown indirectly. The moisture flashes to steam and in the pump casing this steam pocket causes impella to cavitate, reducing flow through the heater with the consequence of high film temperatures and localized overheating of the fluid. This thermal breakdown also causes hydrogen chloride gas to be released. The hydrogen chloride dissolves in the moisture, producing hydrochloric acid and this would explain the accumulation of iron chlorides plugging the sight glass piping.

I note you have this system blanketed with nitrogen. This is not necessary with a truly oxidation-resistant fluid such as THERMINOL. Our usual recommendation is to vent the expansion tank outdoors to the atmosphere. This will allow an exit point for any hydrogen chloride gas or moisture that is formed.

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This information is explained in greater detail in the enclosed copy of our THERMINOL FR Design Guide--Page 13. Also included in this reference is a technique for allowing condensible and/or non-condensible vapors to reach the expansion tank vent more rapidly. This is done by installing a small diameter bypass line on the discharge side of the pump to the top of the expansion tank. A needle or globe valve for controlling flow is installed in this line and flow is adjusted so the expansion tank is maintained at some elevated temperature just above the boiling point of water (slightly above 212°F.). Once the acidity and moisture are vented from the system, you may continue to operate with this same batch of fluid. However, I suggest you send a sample to my attention in approximately another month so we can see if the viscosity increase is accelerating.

Let me know if I can help further.

Sincerely,

S. Shaw
Market Specialist
Functional Fluids

jf

Enclosure

cc: Mr. B. Breitman
American Hydrotherm Corp.
10-55 Jackson Blvd.
Long Island City, New York

DSW 343620

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