BCC: J.R. Fallon - JFALL
D.E. Roush - DROUS

Monsanto

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October 13, 1970

NORTHSTAR DAIRY
350 Endicott Bldg.
St. Paul, Minnesota

ATTN: Mr. Leo Graebner

SUBJECT: New Plant
Zumbrota, Minnesota

Dear Mr. Graebner:

With reference to our telephone conversation on Thursday, I would like to confirm our position regarding the use of Therminol 66 instead of Therminol FR-1 for the subject plant.

In February of this year we learned that polychlorinated biphenyls (PCB) had been discovered in marine, aquatic and wildlife environments. Therminol FR-1 is a chlorinated biphenyl. We also learned that certain animals had the ability to concentrate it in their bodies. When this occurs and such animals may be used for food, the FDA enters the picture and establishes guidelines regarding concentration of the particular chemical in food products.

In September the FDA issued a guideline regarding maximum concentration of PCB in food. The upper limit in milk is 0.2 ppm and in other food products it is 5.0 ppm.

Even before this FDA guideline we had advised existing users of Therminol FR-1 in the food industry to consider replacing with Therminol 66 as we wished to eliminate any possibilities of food contamination. Most of our food industry users have already converted and the majority of the remainder are scheduling conversions at a more convenient time. Typical users of Therminol 66 in food process applications are:

Company	Food Product
General Mills Minneapolis, Minn.	Snack Food Frying
Cargill, Inc. Des Moines, Iowa	Edible Oil Deodorizer
Corn Products (CPC Int'l.) Argo, Illinois	Starch Process

DSW 435135

Company	Food Product
Glidden Durkee Joliet, Illinois	Edible Oil Deodorizer (New plt. - 2 months from startup)

Therminol 66 is much more widely used in the chemical process industry and the major reason is that it is capable of operating at higher temperatures than FR-1. We generally consider Therminol 66 for temperatures up to 650°F, whereas we limit FR-1 to 600°F. In addition to it's higher temperature capabilities, Therminol 66 is also advantageous from the standpoint of better heat transfer (higher specific heat) and lower pumping costs. And most importantly, it does not exhibit the ability to concentrate either in the animal life chain or the environment. A copy of the toxicity data on Therminol 66 is also enclosed.

The only disadvantage of Therminol 66 is it's inability to be classified as fire resistant; yet with all of our installations in chemical process plants we have not to date recorded a single fire. Since a statement like "fire resistant" is strictly relative the classification by UL should shed some light on the fire resistance of various fluids.

Product	UL Classification
Therminol FR-1	2 - 3
Paraffin Oil	10 - 20
Kerosene	30 - 40
Alcohol	60 - 70
Gasoline	90 - 100
Ether	100

In this classification Therminol 66 would fall in the range of 10-15. Generally the only extra precaution in a Therminol 66 system might be to consider a sprinkler system for the use area and a manual steam snuffer for the combustion chamber of the heater.

I hope that this letter answers the major questions regarding the use of Therminol 66 for the subject plant. The idea of using a liquid phase system to produce steam and hot water is not only very flexible but it can also result in a tremendous labor savings over the con-

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ventional steam system. We would very much value you as a customer yet we feel that it is in the best interests of both parties to use Therminol 66.

Very truly yours,

James J. Roder (saa)

James J. Roder
Heat Transfer Specialist
THERMINOL

JJR/saa
ENC's

CC: Mid-American Dairyman
P.O. Box 1837
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ATTN: Mr. D.K. Harmon

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ATTN: Bert Johnson

DSW 435137