July 9, 1957

Mr. Ed Schwerth, Chief Engineer
Joe Lowe Corporation
601 West 26th Street
New York 1, New York

Subject: Aroclor Heater for Donuts

Dear Mr. Schwerth:

Referring to your letter of June 19 to our Mr. R. V. Weyland at New York, he passed along your calculations and we wish to comment as follows.

It appears to us that you have taken the value of one hundred from the table on Page 27 of the Aroclor Engineering Booklet to represent "U". If this is true, we wish to point out that the value which you took from our handbook represents an Aroclor film coefficient only. Accordingly, you would not be as well off on heating surface as your calculations would indicate, as we have interpreted them. However, if more heat is needed in the heat-up stage, this might be accomplished by merely pumping a greater volume of Aroclor.

The overall heat transfer co-efficient of Aroclor to the fat can be calculated according to the following equation. The values are from a handbook on heat transfer and the final estimate as figured is based upon having a good flow of Aroclor through the coils in the fat.

$1/U = 1/Lo + 1/Li + Lw/kw + Lo/ko + Li/ki$

Lo = film co-efficient of fat = 100 $1/Lo = 0.0100$

Li = film co-efficient of Aroclor = 200 $1/Lo = 0.0050$

Lw/kw = conductance of stainless steel, 16 gauge = 0.00062

Lo/ko = conductance of heat thru deposit outside tube = 0.004

Li/ki = conductance of heat thru deposit inside tube = 0.006

$1/U = 0.01 + 0.005 + 0.00062 + 0.004 + 0.006 = 0.02562$

U = 39 Btu/sq.ft./°F.

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To answer other questions in your letter, we comment as follows.
1) The type of heater which we would suggest is the International LaMont forced circulation unit as illustrated in our literature and manufactured by the International Boiler Works at East Stroudsburg, Pennsylvania. If you decide to contact these people, we would suggest your calling Mr. Georg Stabenow and I am sure he would be most pleased to be of further assistance regards estimating heating requirements to do the work needed in frying the donuts.

2) The type pump we would suggest is a cast steel centrifugal pump fitted with a deep water-cooled stuffing box.

3) We would recommend that the pipe connections must be welded and flanged to avoid leakage. Threaded connections about which you asked, would not be suitable, in our opinion, as we would be fearful of Aroclor leakage and this must be avoided, particularly when processing a food product as in your proposed application.

4) You asked about location of the expansion tank and whether it must be six feet above the system or whether it could be less. While mounting it six feet above the system is often practiced, we believe that the essential thing is to have the expansion tank located at least slightly above the highest level of the overall installation.

When you have had opportunity to review our above comments, please let us know if we can be of further assistance.

Very truly yours,

P. G. Benignus, Supervisor
INDUSTRIAL FLUID SALES

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