cc: F. B. Zienty - MO-3
H. L. Hubbard - Res-3
P. G. Benignus - Roberts Bldg.-3
C. M. Williams - " "

August 16, 1955

Mr. R. C. Odell
Capacitor Engineering
Allis-Chalmers Manufacturing Company
P.O. Box 512
Milwaukee 1, Wisconsin

Dear Mr. Odell:

Mr. Benignus has requested that I send you some detailed information regarding the coefficient of expansion of Aroclor 1242 over a temperature range of -40 to 120°C.

Data are presented for the specific volume of Aroclor 1242 at temperatures down to 0°C. Since we do not have techniques to handle the weighing of Aroclor at a constant temperature of -40°C. or even -20°C., I have extrapolated the attached curve to the low temperatures.

By using the formula $V_t = V_{t_1}[1 + \alpha(t-t_1)]$, the coefficient ($\alpha$) can be determined at any temperature range. The degree of accuracy of the coefficient will depend to some extent on the reading of the specific volume curve. The coefficients obtained should be satisfactory for most uses.

I have calculated the coefficient of expansion of Aroclor 1242 for 20 degree intervals.

Temperature Range, °C.	Coefficient of Expansion, cc/cc/°C.
-40 to -20	0.000715
-20 to 0	0.000712
0 to 20	0.000716
20 to 40	0.000726
40 to 60	0.000729
60 to 80	0.000726
80 to 100	0.000716
100 to 120	0.000706

The accuracy of the method does not warrant the number of digits in the above table, but I have included them to show the slight difference in the calculated values.

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The curve was read to give the following specific volume values:

Aroclor 1242

Temperature	Specific Volume, ml/gm
-40°C.	0.6923
-20	0.7022
0	0.7122
20	0.7224
40	0.7329
60	0.7436
80	0.7544
100	0.7652
120	0.7760

I am sure the included data will allow you to estimate the volume change in Aroclor over any portion of the desired temperature range.

Very truly yours,

A. M. Ellenburg
Research Department

dm
Attachment

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