

Anniston, Alabama

Mr. H. O. Mehner

Plant B

May 11, 1948

H.O.M. to R.L.J.
4/21/48

Aroclor 1260 - Viscosity Determination

Measure.

R.I. Jenkins - C.E. Dargin

Edgar L. Hardy

F.A. Barker

J.F. Stickly - Plant B

C. Barbre - D.B. Hosmer - Plant B

F.J. Holzapfel - Plant B

This Copy For

Dear Harry:

Any comments which we would have made in answer to your memos of 3/24/48 and 4/21/48 on this subject would be valueless unless critical data were available in our laboratory. Therefore, we awaited the arrival of your samples for making our study.

The test samples have been measured to the best of our knowledge as you have desired. Reference and standardization conditions have been used with the exception of one factor which we could not control. The room temperature approached 97°F. on the day tests were made and it was above 86°F. during all tests. This high temperature, according to ASTM D 88-44, may introduce errors up to 1%. As you consider our results please keep this in mind. It will help explain different results obtained on standards at various times during the year.

Samples of Aroclor 1260, Lots U-25 and A-9 were tested after standardizing our viscosity tube with your sample of API Oil Standard Alpha 47. Tests were made by two different analysts working in rotation.

API Oil Standard Alpha 47 (Dated March 25, 1947)

Viscosity (Saybolt Universal Seconds) 210°F.

Certificate
Analyst - A

B

A

B

B

Average

Correction needed

51.7

51.4

51.4

51.4

51.3

51.4

51.38

+0.32

DSW 330828

STLCOPCB4077472

May 11, 1948

Aroclor 1260 from Plant B

Sample	Viscosity (Saybolt Universal Seconds) 210°F.
U-25 A	72.1
B	72.0
A	72.1
B	72.0
Average (uncorrected)	72.05
Average (corrected)	72.5
A-9 A	72.4
B	72.2
A	72.4
B	72.2
A	72.4
Average (uncorrected)	72.32
Average (corrected)	72.7

Our measurements are made with a conventional stopwatch, but it has not been checked lately. Previous checks with standard oil have been satisfactory, thus leading all concerned to believe that the stopwatch is precise enough.

Since your recent letter gave the impression that the previously reported comparison might be invalidated by errors in your timer, no comments will be made on those data.

Your principle that the correction factor is proportional to the time of flow as compared to the standardization time agrees with our views on this subject. However, I have read no authority on viscosity measurements. We have added a correction in the above comparative tests in accordance with this reasoning.

On standardization tests made last fall, no correction was found necessary for our tube. Therefore we have not made any corrections to our routine measurements.

Our method of handling Aroclor samples is similar to your routine. Sample bottles are warmed until the contents are evenly heated to 60 - 80°C. A clear beaker is then filled by straining the Aroclor. No further straining is considered necessary when filling the viscosity tube. Contrary to your finding we do not heat the Aroclor over the 3°F. rise stipulated by ASTM, however, this has no bearing on the results in my opinion. The bath temperature required to maintain the Aroclor samples at 210°F. was found to be 211.4 - 211.6°F. in the comparison work with your samples.

DSW 330829

STLCOPCB4077473

May 11, 1948

We run routine tests on Aroclor at only one temperature, so we have no information on the variance in the correction factor with temperature. Since the viscosity coefficients of two liquids vary in direct proportion to the densities and the times of flow, it is reasonable to assume that for liquids of approximately the same density that time is the major consideration. In converting from Saybolt to centipoises it is necessary to use a density factor, so the density can be eliminated from our consideration, therefore, I would add the same correction factor for equal times at all temperatures. In other words the same factor at 50 SUS whether taken at 100°F. or 210°F. would be added. The proportional factor would be used on the correction for longer or shorter times of flow. Calibration at another temperature with the same oil would be required to answer the question definitely.

On reviewing your General Method - 25 on Saybolt Universal Viscosity, these comments are made under the same number heading as used in your write-up.

1. I presume that your flasks were standardized at 20°C.
2. C. In the use of a stirring rod, it might be wise to support it similarly to the method used to prevent the thermometer from touching the bottom. This will eliminate any accidental damage to the orifice.

We hope that this comparison of data will be of value in obtaining agreement between the two laboratories. Let us know if we can be of further help in arriving at a satisfactory conclusion to the viscosity differences between Monsanto and General Electric Company.

A. M. Ellenburg

AME:rs

DSW 330830