

Anniston, Alabama

May 27, 1948

This Copy For

Messrs.

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Monsanto, Illinois

Dielectric Testing Equipment

The test methods used in Arcolor analyses have been revised for a customer who is getting started in the use of Arcolor. For your perusal, I am enclosing a copy of our methods. The attached set of methods include our electrical tests on Pyranol.

Since our Pyranol production as shipped to G.E. is not used for transformers; we do not make the dielectric strength test. Equipment is available in the Research Department for this test if it becomes necessary to make the test on short notice. The A.S.T.M. D 877-45T is followed in our dielectric strength measurements.

The equipment used by the Analytical Laboratory for dielectric constant and resistivity measurements are made by General Radio Company, Cambridge, Massachusetts.

For resistivity, a General Radio Type 544-B Megohm Bridge with a 500 volt power supply unit is used. A test cell furnished by General Electric Company consists of two concentric nickel plated brass cylinders spaced at 0.1 inch. Proper distance between electrodes is maintained by a Pyrex glass spacer plate. Complete description of cell is in the test method.

Equipment for the dielectric constant measurements is listed in the method No. 14-36-48. This equipment has changed design in the last ten years and new models have to be used. For a set-up now the following items are the most reasonable in price for the required measurements.

Capacitance Bridge	General Radio Company	Type 716-C
Amplifier and Null Detector,	General Radio Company	Type 1231-B
Oscillator	General Radio Company	Type 1302-A
Air Condenser (one that can stand up in Arcolor)	at least 500 mmf.	

Description and prices of all General Radio Company equipment are found in their 1948 Catalog L. We use only the manufacturer's data for assembly and operation.

If you do not have this catalog, probably Dr. R. H. Munch at Organic Research can loan you a copy for a quick look. He may even comment on the equipment for you.

Accuracy of the electrical measuring equipment is given with the two bridges. For the capacitance bridge, the accuracy is $\pm 0.2\%$ in the

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Mr. H. O. Hehner

- 2 -

May 27, 1948

range of the Aroclor measurements. The resistivity bridge has an accuracy of $\pm 10\%$ in the Aroclor range when used with a cell having a constant of approximately 800. (See method.)

Meticulous care in cleaning and storing the cells and spacer are essential in the resistivity measurements. Duplicate analyses on the same sample of Aroclor will check within the accuracy of the instrument. According to the report of A.S.T.M. Committee D-9 on "Electrical Insulating Materials" issued September 1947 page 540, different samples of the same material may vary by at least 50 per cent. Our experience has been that we can check much closer than this.

Our instrument is checked with standard resistances at intervals to test the circuits in the resistivity bridge.

Let us hear from you regarding any further details on which we may be able to assist.

A. M. Ellenburg

AME:rs

Attached

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