Monsanto

FROM (NAME & LOCATION) R. H. Munch - St. Louis Organic Research - South Second Street

DATE December 5, 1969

CC: P. G. Benignus
D. A. Olson
H. S. Bergen

SUBJECT FUTURE POSTURE - DIELECTRICS

REFERENCE

TO : W. R. Richard

Aroclor MS

Don Olson has asked how we should go about reaching our objective of being the world leader in the Aroclor business. Under present conditions this question should probably be changed to: How should we go about achieving maximum profit from dielectric fluids or dielectrics in general? There are two reasons for changing the question. One is the environmental pollution problem. The other is that technological needs in the dielectrics area are changing with ever increasing rapidity. Both are compelling reasons.

Attached is a copy of an outline of our current electrical fluids technical program with the items listed roughly in order of priority. We discussed pertinent parts of this with Paul Benignus, Bill Kuhn, Bob Kountz, Quentin Thompson and Don Olson.

In the dielectrics business area we have reached a situation where it is necessary to have a more and more detailed knowledge of how our fluids will be used by our customers in order to promote sale of our products. This led Don to ask whether our capacitor technical facilities are adequate or whether equipment additions are necessary.

I agree that we must have a more detailed understanding of capacitor technology. To get this, we must have available:

1)	Capacitor winding facilities	$100,000
2)	Capacitor impregnation facilities	10,000
3)	High voltage Schering bridge to test the resulting capacitors	5,000
4)	Corona inception and extinction measuring equipment	10,000
5)	Accelerated life test equipment	10,000

We have more or less adequate equipment for items 2, 3 and 4. We have had capacitor rolls wound for us by Electric Utilities. This has enabled us to start to get the desired information. We could decide to purchase items 1 and 5. Each of the above five areas present many complex problems which take time and capable, experienced manpower to master. It

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is risky to assume that we can master all five of these areas in time to achieve our objective. We certainly cannot do it without adding at least one technical and one non-technical man to our group even if we buy the equipment.

This leads me to propose that we should try to work closely with an established capacitor manufacturer to take advantage of his existing equipment and competence in the five areas mentioned. The organization chosen should be:

1) Highly competent technically
2) Trustworthy and cooperative
3) Located close to St. Louis if possible
4) One that will foster our business objectives.

It would be ideal if we could work with G. E. on this basis. However, they are dedicated to a "do it yourself" policy. They are succeeding well enough at it that they probably would not be receptive. Two other possibilities would be Electric Utilities and Cornel Dubillier. Both of these would probably be receptive. I recommend that we explore the possibility of this approach to our problem.

We should also have a policy on how we will use any technical advances made through this program. In the past, we have only considered giving such results to our Aroclor customers as a free present to keep them happy. We should consider whether or not there is any more profitably way to use the results of our research. Perhaps we should have a joint manufacturing agreement with the organization we work with on testing our research developments.

We expect Mr. Bill Robinson of Cornel Dubillier to visit us on December 12. We need to clarify our thinking on the points raised in this memo. This is particularly true since Mr. Robinson has expressed a willingness to do testing work up through and including capacitor life tests on materials we recommend.

We will arrange a meeting including you, Paul Benignus, Don Olson and me for early next week to discuss this situation and decide on a recommended course of action.

R. H. Munch

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ELECTRICAL FLUIDS PROGRAM

I. Environmental Pollution Studies

   1) Analytical research

   2) Animal feeding studies

   3) Waste stream analysis

   4) Environmental sample analysis

   5) Biodegradability studies

II. Establish what compounds and levels are acceptable

   1) Among ourselves

   2) With customers

   3) With government

III. Develop waste recovery methods

   1) Adsorption

   2) Solvent extraction

IV. Develop waste disposal methods

   1) Incineration

   2) Dehalogenation by hydrogenation

   3) Complete reclaim in our plants

V. Clean up our own operations

VI. Encourage our customers to clean up their operations

VII. Determine which fluids are acceptable on the basis of studies under I.

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VIII. Select or modify current fluids to make them acceptable

1) Fractionate Aroclor 1242 to remove tetra and higher homologs

IX. Purify and evaluate new fluids

1) Tolyl xylyl sulfone

2) 2,4' dichlorobiphenyl

3) 2,2' dichlorodiphenyl ether

4) Silicate esters

a) Aliphatic OS-59

b) Mixed

c) Aromatic TAS 190

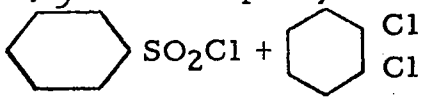
5) HB-40

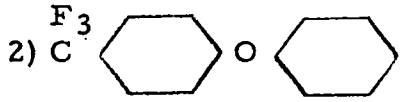
6) Isopropyl biphenyl

7) Cyclohexyl benzene

X. Synthesize new fluids

1) 3,4 / 2,3 dichlorobiphenyl via



2) 

3) Explore use of blocking groups to prevent or reduce ionization

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XI. Find out the status of

a) Negotiations with {General Electric / British Cellophane} regarding resale of their polypropylene film for capacitor use

b) Negotiations with respect to Imperial Smelting - Flutic Fluids

XII. Acquisitions related to the Electrical Fluids business - Doble Engineering Hilton Engineering, etc.

XIII. Joint venture with capacitor or transformer manufacturers to secure better access to technology in these industries to supplement and aid our chemical expertise

XIV. Find stabilizer for Aroclor 1242

1) Select compound

2) Learn how to purify it

3) Learn its stability

4) Determine its efficiency as a scavenger

XV. Evaluate durfactants to see if they will permit satisfactory impregnation of all film capacitors

XVI. Provide a fluid suitable for use in metallized film or paper capacitors

XVII. Insure that capacitor fluids are compatible solubility wise and electrically with polypropylene film

XVIII. Provide G.E. with an acceptable substitute for 80% Aroclor 124, 20% TTCB

XIX. Define a transformer insulation system which will permit design of a 125° C transformer. See if the insulation from this program might have application in dry type transformers.

XX. Determine the impulse ratio of Aroclor 1242 and provide means for overcoming its low impuse ratio if that is confirmed.

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