MONSANTO COMPANY
W. G. Krummrich Plant

March 10, 1966

Divisional Aroclor Meeting
Minutes

cc: Messrs.
L. L. Fellinger - GO
J. R. McClain - WGK
W. G. Papageorge-Anniston
A. C. W. Pemberton - Newport

Messrs.

D. C. Armstrong	- WGK	P. E. Heisler	- WGK
P. G. Benignus	- Gen. Office	D. B. Hosmer	- Gen. Office
J. K. Blacow	- Newport	H. L. Hubbard	- So. 2nd
G. R. Buchanan	- Gen. Office	R. J. Kuster	- WGK
R. W. Bucknell	- So. 2nd	J. J. Luecken	- WGK
J. Campbell	- MCL, London	F. A. Hauser	- Gen. Office
H. C. Carder	- WGK	J. A. Mullendore	- Gen. Office
O. E. Dolin	- Anniston	W. R. Richard	- So. 2nd
L. C. Fuhrmeister	- Anniston	R. A. Steenrod	- Gen. Office
D. E. Harris	- WGK	W. F. Waychoff	- Gen. Office
V. R. Haupt	- Anniston	R. S. Wobus	- Gen. Office

C. E. Woodward - WGK

Contribution of Aroclors to Organic Division profits is sizable. Monsanto wishes to hold and strengthen its domestic marketing position. Marketing people are convinced we must meet production and quality challenges from foreign manufacturers. Monsanto is striving to meet these confrontations.

Yours truly,

C. E. Woodward

C. E. Woodward
Secretary

CEW:gg

0358250

TOWOLDMON0057658

TOPICS COVERED

I.	Profit Objectives	- R. S. Wobus
II.	Business and Marketing Position	- G. R. Buchanan
III.	Corporate Objectives	- G. R. Buchanan
IV.	Quality Commitment	
	A. International	- J. Campbell
	B. Domestic	- P. G. Benignus
	C. Corporate	- G. R. Buchanan
V.	Testing and Analysis	- O. E. Dolin, R. J. Kuster
VI.	Manufacturing Facilities	
	A. W. G. Krummrich	- D. E. Harris
	B. Anniston	- V. Haupt
	C. Newport	- J. K. Blacow
VII.	Process Improvements	- D. C. Armstrong, J. K. Blacow, and L. C. Fuhrmeister
VIII.	Non-Electrical Grade Aroclors	- W. F. Waychoff
IX.	Patent	- R. W. Bucknell
X.	New Fluids Applications	- W. R. Richard
XI.	Packaging	- R. G. Moody

0358251

TOWOLDMON0057659

MINUTES OF DIVISIONAL AROCLOR MEETING

Meeting Objectives

The objective of the meeting was to bring corporate Marketing, Sales, Research, and Production people with Aroclor responsibility together for an exchange of information, and to broaden Monsanto's scope for the product to include international Marketing and Production.

Competition

There are three significant non-Monsanto manufacturers. Monsanto is the sole marketer in the United States and United Kingdom. Aroclor is in a unique product position. It is our objective to market in areas where Monsanto has the advantage and to expand sales from 74% to 78% of the world wide market by 1970 as seen below:

Aroclor Marketing Position

	1965 Sales			1970 Forecasts		
	World Wide M lbs.	M.C. M lbs.	M.C.L. M lbs.	World Wide M. lbs.	M.C. M lbs.	M.C.L. M lbs.
Capacitors	40,000	23,000	3,100	50,000	30,000	5,600
Transformers	15,000	13,000	600	25,000	16,000	2,000
Plasticizers	25,000	20,000	3,500	35,000	25,000	8,000
Fluids	9,000	6,000	---	15,000	11,000	500
Miscellaneous	6,000	1,500	---	10,000	5,000	---
TOTAL	95,000	63,500	7,200	135,000	87,000	16,100

Corporate Objectives

The corporate objective for Monsanto Aroclors is to hold all UK and US business presently established, and to establish marketing positions for the remainder of the world outside EEC and Japan, by customer servicing and with product quality. Specific strategy for meeting these objectives are listed:

1. Maintain production capability at least 25% higher than annualized sales to insure product availability.
2. Concentrate in marketing areas where Monsanto has the advantage.
3. Develop international cost-price relationships for distribution analysis and decision.

TOWOLDMON0057660

4. Survey the cost-price relationships of significant producers to ascertain a realistic competitive picture.

Foreign Manufacturers

There are five producers of Aroclors. They are: Bayer (Germany), Prodelac (France), Caffaro (Italy), Flix (Spain), and Kanegafuchi (Japan). Bayer is the world's third largest chemicals manufacturer; Bayer's Aroclor business is 35 years old. Prodelac is a smaller, youthful and aggressive firm which has manufactured Aroclor for 27 years. Aroclor is important to Prodelac's favorable profit picture. Prodelac has, no doubt, recently innovated their production facilities.

MCL is feeling product pressure based on quality. Marketing and Sales people feel that Monsanto's American customers are unaware of the quality of foreign material. Quality comparisons are listed below:

	Prodelac	Bayer	M.C.	M.C.L.
Resistivity, 10^9 ohm-cm	2,000	4,000	1,000	1,000
Power Factor, 60 cps., %	2.0	1.3	5	2.0
Water Content, ppm	30	25	25	20
Color, APHA	3	3	40	15
Stability, (Westinghouse)	0.20	0.23	0.7	0.30

Neither MC or MCL material produces "the quality material" in any one of the five areas. These specifications are furnishing a competitive comparison abroad and are at present most significant.

Quality Goals

Per HCC
1242 only

It was felt that Monsanto could apply its resources to present electrical grade Aroclors having the listed quality:

	Competition	M.C.
Resistivity, 10^9 ohm-cm	5,000	10,000
Power Factor at 60 cps, %	0.2	0.2
Water Content, ppm	20	20
Color, APHA	3	3
Stability (Westinghouse)	0.2	0.1

0358253

TOWOLDMON0057661

This material is envisioned to be of equal quality in four of five areas, and to possess lower therminal chemical chlorides.

Process

Manufacture of Aroclor is accomplished by catalytic chlorination of biphenyl and purification of the chlorination mass. Biphenyl and chlorine yields are above 95%. Chromatographs are being used to observe the product of chlorination for process variations. The chromatograms picture the distribution of some 49 isomers. Prodelac, WGK, and MCL batch chlorinate. Anniston chlorinates continuously in a four stage reactor. Batch chlorination produces a more "peaked" and uniform product. Anniston, MCL, and WGK employ nearly identical catalytic and purification systems. Prodelac, unlike MC and MCL, separates their purified product into two fractions. The low boiling, lower chlorinated fraction is returned for additional chlorination. There is evidence that they may fractionate.

Monsanto purifies its Aroclor in batch stills without fractionation. WGK feels that product quality depends upon distillation techniques. Krummrich PR&D has conducted process research on distillation. Anniston TSD has studied earth treating. At present, Monsanto possesses technology to produce a highly stable product which will meet the quality specifications of any foreign manufacturers.

Monsanto is justified in transferring its existing technology to production units from a marketing standpoint. Increased costs could be offset with a one to two cent per pound price increase of electrical grade material if necessary. This quality product will lower or eliminate earth treating costs to our customers. Monsanto will protect the domestic market and enable successful competition in the international marketplace.

Non-Electrical Grade Aroclors

Sales of plasticizer material have increased from 3 to 18 million pounds since 1959 and are projected to 25 million by 1970. Aroclors are used in adhesives, waxes, plastics, surface coatings, and solvent formulations. They are resistant to chemicals, fire, and oxidative attach, and have found success in plasticization of "hard to plasticize" resins. ICI may enter the US plasticizer market with chlorinated paraffins. Again, we must be alert to competition and be a top notch sole supplier.

Increase usage is expected in areas of carbonless carbon paper along with solids applications. Therminal 77 is a new patented heat transfer material for 700°F service. All new product applications will be patented to protect both the product and its use.

TOWOLDMON0057662

Storage and Packaging

Resistance of electrical grade Aroclors degrades from 1500 ohm-cm to 1,000 ohm-cm on tank car loading. Drumming procedures are more damaging. Degradation is to 700 ohm-cm. Resistance deterioriation appears to be affected by moisture, method of container manufacture, lining procedure, and atmospheric exposure.

A 34 all aluminum tank car fleet is in fabrication. Aluminum contact will not be detrimental to electrical properties while Aroclor is in transite. It has been suggested that each car be washed with an Aroclor spray before loading and that the flush be continuously analyzed for power factor.

Monsanto will assign a member of the division the responsibility for packaging and loading technique evaluation and recommendation.

TOWOLDMON0057663