Monsanto

FROM (NAME & LOCATION) C. Paton - General Offices

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SUBJECT FUTURE PLANS FOR AROCLOR PLASTICIZERS

REFERENCE

TO : W. F. Waychoff

The adverse publicity on Aroclors may have little impact or it may be very damaging, particularly if customers decide to play it safe and formulate around Aroclors.

I have tried to put together a possible plan to be implemented if the worst happens and customers insist on getting Aroclor replacements which are not poly-chlorinated biphenyls. I have concentrated only on domestic markets because legislation overseas is less stringent than it can be in the U. S.

Chlorinated Biphenyls

1968 sales in the U. S. were 15.2 M pounds.

Our main markets in the U. S. (1968 sales) are:

NCR	:	6.0 M Lb. (Aroclor 1242)
Distributors	:	4.5 M Lb.
Sealants	:	1.4
Coatings	:	1.3
Adhesives	:	0.8
Hot Melt Adhesives	:	0.5
Miscellaneous	:	0.7

A major portion of our distributor sales are likely to go to the coatings industry.

Our sales of 7-8 M pounds to the sealant/coatings/adhesives industry should be looked at in the light of synthetic resin sales of over 3 billion pounds per year to these industries. This probably equates to about 12 billion pounds of sealant/adhesive/coatings sold in the U. S. per year. In other words, Aroclors are present at less than 0.08% over-all.

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Our efforts on chlorinated biphenyls should be concentrated in order of priority:

1. No carbon required paper
2. Coatings
3. Sealants

No Carbon Required Paper

Monsanto enjoys a strong position in this industry which is dominated by NCR, followed by 3-M with its Action Paper. There are strong rumors that Champion will enter the field in 1969 with a product utilizing Aroclor 1248. In 1968, Nashua enquired about Aroclor 1232 for this type paper.

Possible Negative Factors	Possible Positive Factor	Complicating Factor
Decreased sales of Aroclor 1242 to NCR	Increased sales of TBP/DEP to 3-M	Weak Monsanto position in TBP
Sales of Aroclor 1248 to Champion don't materialize		Lack of proprietary position in DEP

NCR have a research program to evaluate Aroclor 1242 replacements mainly because they want a non-proprietary product, product with lower odor and lower cost. Aroclor 1232 is considered superior to 1242 but odor rules it out. A year ago, we began to supply Aroclor/HB-40, Aroclor/IGM blends for evaluation by NCR not to aggressively affect a change but to keep NCR busy evaluating our products instead of the competition.

We have approached 3-M's P. A. at Hartford plant as to our willingness to work on cheaper replacement for TBP. Response was good but we have yet to follow technically. This is in our 1969 marketing plan for action.

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Action:

1. (NCR)
   High level MC/NCR contact to determine

   a) their reaction to Aroclor publicity.

   b) if NCR are alarmed, to emphasize our action to help them find a replacement product if NCR deem this necessary.

2. (NCR)
   Depending on reaction to #1, visit by Farrar/Paton to define closely the parameters required in NCR's product.

3. (NCR)
   Following #2, Farrar to head a "task-force", utilizing consultant help from CRD, Cellu-Chem, Inorganic/PP&R (binders) if need be to find Aroclor 1242 replacement.

4. (Champion)
   Lee Judy (Cellu-Chem) to visit Champion Research, Chicago, to determine status of Aroclor 1248 project and whether NCR-type program needs to be initiated.

5. (3-M)
   Field Sales to determine technical contact at 3-M on Action Paper.

6. (3-M)
   Product Group visit to get response to possibility of working jointly on a TBP/DEP replacement by stressing high and continually increasing TBP cost.

7. (3-M)
   Further action to await implementation of #5 and #6.

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Coatings

The strengths of the Aroclors in coatings lie in:

1. Inertness
2. Oxidation Resistance
3. Resistance to acid/alkali attack.
4. High compatibility levels with many resins.
5. Maintenance of good physical properties (tear strength, tensiles, etc.).
6. Extremely low moisture vapor permeability (swimming pool paints/concrete curing compounds/corrosion-resistant coatings.
7. Relatively low cost per pound.

Disadvantages are:

1. Poor U.V. Stability
2. Difficulty of handling Aroclor 1260/1262
3. High specific gravity (For example: a replacement for Aroclor 1254 would be equivalent on a volume cost basis at 23 cents/pound if S. G. is 10 pounds/gallon, or 28 cents/pound if S. G. is 8 pounds/gallon.)

Aroclors 1248/1254/1260/1262 are the major Aroclors sold to the coatings industry.

We believe Application Research in conjunction with Central Research/Monsanto Research Dayton should explore the possibility of replacements for Aroclor 1248/1254/1260/1262 to meet desirability parameters 1-6 and overcome disadvantages 1-3.

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Our technical efforts at finding replacements will be greatly diluted if we are swamped by sales/customer requests to attack the problem on a piece-meal basis. It is strongly recommended that all customer enquiries be directed to Field Sales who will have prepared answers on Monsanto's position.

Our distributors should be asked to quantify their Aroclor sales to the coatings industry and their top management given confidential copies of Monsanto's position to be used only when customers specifically ask.

Our salesmen should try to minimize enquiries from customers of our distributors being passed on to St. Louis.

The Product Group is willing to visit the following key customers and resin manufacturers if necessary to determine how to proceed on a joint program of finding Aroclor replacements:

Goodyear	(Pliolite resins)
Hercules	(Parlon rubber)
Sherwin-Williams	

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Action

1. (J. D. Wright)
   Issue prepared statement to Sales.

2. (J. D. Wright)
   Issue instructions to regional managers that a deluge of individual enquiries should not descend on St. Louis. Our prepared statement will be our only position and only enquiries from key accounts (> $40 M/year in Aroclor sales) should be passed on to St. Louis only if they are not satisfied with statement made by regional managers.

3. (Farrar)
   Are there any other chemical structures basic/proprietary to MC which could replace Aroclors in surface coatings.

4. (Product Group)
   Explore mutual programs with key coatings accounts and resin manufacturers if necessary.

5. (Distributors)
   Handle all customer enquiries via distributor regional manager or directors of marketing for distributors.

6. (Field Sales/Distributors)
   Quantify liquid Aroclor sales to coatings market via distributors.)

Sealants:

This market is possibly the one where we can most easily regain our position if it is threatened. Aroclor is used primarily in polysulfide sealants where there is only one major producer of the polysulfide resin in the world (Thiokol). Over the years, we have developed a close rapport with Thiokol's Marketing Center and they have widely recommended Aroclor 1248/1254/1260, Santicizer 160, HB-40 and most recently Santicizer 261.

Our plasticizers are used in two sealant areas: light construction (joints) and automotive (windscreen sealants).

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In the light construction area, Aroclor 1248 and 1254 are the products currently used. Volatility requirements now indicate that Aroclor 1254 is not good enough for some applications and Santicizer 160 is borderline. Santicizer 278 is being promoted by Thiokol for the most critical application, viz. insulated window glass sealants. In the event of Aroclors being under a cloud, we should be able to exploit Santicizer 278/Santicizer 261 and blends with Santicizer 160.

In automotive sealants, Aroclor 1254 and HB-40 are the two plasticizers currently used. The bulk of G. M.'s sealant is HB-40 based. Thiokol hope to supply Ford with a sealant incorporating Aroclor 1254 and Chrysler use Aroclor 1254. In looking for a replacement, the parameters are compatibility, relatively high viscosity and non-marring of acrylic finishes.

The key to protecting ourselves in the polysulfide sealant area is to continue our close rapport with Thiokol's Marketing Technical Service personnel at Trenton.

Solid Aroclors

Although solid Aroclors (mainly chlorinated terphenyls) have not as yet come under attack in the U. S., a British scientific paper alluded to possible problems based on mono-chlorinated terphenyls. (GLC/mass spectragraphic determinations by Dr. Keller indicate that such isomers are present at less than 0.05% in Aroclor 5460.)

Repercussions could be felt in sales of Aroclor 5460, however. FDA approval is essential to maximize sales for hot melt adhesives. Swift is the only U. S. manufacturer who is putting Aroclor 5460 in hot melts that could be used by the food packaging industry. Swift's world-wide usage in 1969 could come close to 2 M pounds Aroclor 5460. Swift's competitors are aware of this and not too happy. Should the adverse publicity on Aroclors be widespread, I can see possible effects on Aroclor 5460:

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1. Inability to get FDA approval.

2. Action by our competitors (Goodyear/Picco/ Neville/Reichhold) to make the most of our problems.

3. Loss of sales to Swift.

4. Action by Swift's competitors to bring about #3.

It is recommended that we set the minimum possible chlorinated biphenyl content as a specification for Aroclor 5460 in order to get FDA approval. We should continue as rapidly as possible with our plans to re-submit our Aroclor 5460 petition.

Action

1. (Manufacturing)
Can you accept 0.1% chlorinated biphenyl as the maximum level in Aroclor 5460 production.

2. (Product Group/Medical/Dr. Keller)
Proceed as rapidly as possible on program to re-submit petition on Aroclor 5460 to FDA.

Aroclor 1272

With regard to our plans to produce Aroclor 1272, applications for flame retardants may be under a cloud but sales as an intermediate to react with ethanolamine, etc. should be unaffected. Indeed the publicity may have a bonus that anyone planning to produce their own Aroclor 1272 and market other Aroclors may have second thoughts.

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Communications on Aroclor Publicity

It is recommended that with the exception of NCR, we do not bring this publicity to the attention of our Aroclor customers. With the exception of NCR and distributors, we have only eight customers who buy over 140 M pounds of chlorinated biphenyl per year:

Products Research	:	680 M Pounds	(Sealants)
DuPont	:	460	(Hot Melt Adhesives)
3-M	:	400	(Adhesives)
Koppers	:	250	(Coatings)
Sonneborn	:	225	(Sealants)
Industrial Latex	:	180	
Grace	:	170	
Sherwin-Williams	:	140	(Coatings)

NCR	:	6.0 $\overline{M}$ Pounds	(40%
Distributors	:	4.5	(30%)
Eight Majors	:	2.5	(16%)
Others	:	2.2	(14%)

Although PRC are headquartered in Burbank, California and the publicity on Aroclors began on the West Coast, we have yet to get an enquiry from PRC. With regard to DuPont, Grace and Koppers as big chemical manufacturers, they are bound to have had experience of publicity of this nature before and are less likely to panic.

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Cumming Paton

CP:dbw