

St. Louis Research Dept.

December 18, 1964

W. P. Metzner, WMETZ

Herewith is a rough, historical sketch of plasticizer developments within Monsanto. Some of the dates given are a little broad because I have not taken the time required to pinpoint the actual year. Please let me know if you require more accurate information of this type.

Monsanto initially entered the plasticizer^{business} because the first product we ever manufactured, saccharin, had in its raw material manufacture isomeric products which did not qualify for saccharin use. These products were developed for plasticizing cellulose nitrate and later, cellulose acetate. This development occurred in the early 1920's and such products as Santicizer 9, Santicizer 8 and the Santolites were involved.

Approximately 1930, Monsanto began making such products as tricresyl phosphate, triphenyl phosphate, and diphenyl phthalate. These products were for plasticization of naturally occurring resins such as shellac and primarily for cellulose acetate and cellulose nitrate.

About 1932, we began the manufacture of the phthallyl glycolates of which we have three continuing products. These are called Santicizers M-17, E-15, and B-16.

About the same time, dimethyl and diethyl phthalates were manufactured primarily for the plasticization of cellulose acetate. About 1933, we started manufacturing dibutyl phthalate.

In 1936, we purchased Swan Chemical Company and with it, the basic technology for making Aroclors, some of which went into, and still continues to, the plasticizer field. HB-40 was probably developed as a secondary plasticizer around 1938. As you know, this is also a biphenyl derivative.

After the war, starting late in 1945, we put on a surge of effort to develop plasticizers for the burgeoning polyvinyl chloride market. By 1946, Santicizers 141 and 160 were being marketed.

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The plasticizer plant at Everett was justified in about 1950 and we started the manufacture of competitive products such as di-2-ethylhexyl phthalate (DOP) and diisooctyl phthalate (DIOP). About 1955, we started manufacturing diisodecyl phthalate and about 1960, ditiidecyl phthalate. Also, around 1957 we started manufacture of the adipate plasticizers. Such products as dioctyl adipate and didecyl adipate were made.

About 1957 we started the manufacture of polymeric plasticizers, the first of which was Santicizer 409. A special plant was built at Everett about 1959 for the manufacture of this product and Santicizers 405, 406 and 411.

Also about the period of 1959, a phthalate ester plant was put into operation in California. This plant makes DOP, DIDP and ditiidecyl phthalate. They might even manufacture some other products.

About 1962, the Delaware River plant in New Jersey came on stream to make phthalic anhydride, benzyl chloride and Santicizer 160. This Santicizer 160 plant is a continuous plant which makes this single product at a rate of about 7 M lbs per month.

Extensive sales of our plasticizers overseas began expanding rapidly around 1961-2. These sales in the European Theater have expanded to a point where we expect Monsanto's Board of Directors next week to approve a Santicizer 160 plant which is a duplicate of the Delaware River plant.

With regard to International activity, we leased our know-how and sold manufacturing processes to Sicedison in Italy. They also purchased our application know-how and our contract runs about two more years. They manufacture Santicizer 160. A somewhat similar arrangement was made with Japan, where they make Santicizer 160, DOP and a number of other products according to our processes. Plants have been operated by our subsidiaries in Argentina and Spain, as well.

We have a number of additional products in Development which were not enumerated previously. These products are the bis phthalates which are permanent-type plasticizers which perform like the polyesters, for instance, Santicizer 409. We also have a polymerizable plasticizer in Development which is called Santoset 1. We have some modified benzyl phthalate products also being developed for specialty applications and the market potential is favorable.

Our total sales are in the range of 35-40 M dollars domestically and we expect that added to the Overseas sales by 1970, we will be at about 75 M dollars sales.

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To: W. P. Metzner

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Metz, I hope that this brief sketch answers some of your questions. Please let me know if you want me to be more specific. A number of our minor products I did not even mention. I have not mentioned the blends of many of our plasticizers which are important from the marketing viewpoint.

Joseph R. Darby

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