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April 3, 1958

OC DOCUMENT NO. 1392 Supplement 1

TO: Chairman, Operating Committee

FROM: Commerce Member

SUBJECT: Export of Phthalic Anhydride to European Soviet Bloc

Reference: OC Document 1392

1. Background

In the reference document, the Department of Commerce recommended that three applications covering the export of phthalic anhydride to the European Soviet Bloc be rejected. This recommendation was concurred in by the Operating Committee. (PD 1348).

The Department stated, in the reference document, that a technical review was being conducted to determine whether phthalic anhydride should be placed on the control list. This study has been completed. (See attachment 1).

2. Recommendation

In the light of this study, the Department of Commerce concludes that phthalic anhydride does not qualify for either multilateral or unilateral control; and that the rejection of applications by the U.S. does not contribute to the security of the United States, and has no effect other than to transfer the business to European producers.

The Department therefore proposes that future applications for the export of phthalic anhydride to the Soviet bloc be viewed favorably.

Additionally, it is recommended that favorable action be taken on a formal appeal which has been received from the applicant in Case No. 150697 (See attached letter from Monsanto); on a request for reconsideration received from the applicant in Case No. 176481, (See attached letter from Leslie Kleyman); and on an additional case (No. 197744)which was recently resubmitted. This third case was originally submitted in early February and was RWA'd.

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DOC Exempt Letter On File

These three cases, all of which are for the USSR, total approximately 5,500,000 lbs.

3. Strategic Evaluation

An analysis of phthalic anhydride in terms of PD 1100 indicates that the criterion for strategic rating are not met. Specifically, phthalic anhydride is not designed specially or used principally for the development, production or utilization of arms, ammunition, implements of war or atomic energy materials. Its military significance stems from the use of products for which it is the raw material, and not from the use of phthalic anhydride as such.

Attribute three is therefore not met.

The technology for producing phthalic anhydride is well known throughout the world, and in any case such technology is not extractable from the material itself.

Attribute four is therefore not met.

The primary military significance of phthalic anhydride stems from its use as a raw material for the production of phthalate esters, which are plasticizers used in making rocket fuels and other military propellants (See table 1).

The data on Soviet bloc production indicate that Soviet production is of such magnitude that no critical deficiency of this material exists.

U.S. consumption of phthalic anhydride for plasticizers in 1944 was 69 million lbs., used for cable lacquer, insect repellants, and propellants. Soviet bloc production of phthalic anhydride is reported as 40 to 46 million lbs. as of 1954, which would be more than ample for propellant requirements.

Attribute five is therefore not met.

(It is interesting to note that phthalic anhydride was at one time on List III (item 3754) but was decontrolled in 1954. It was one of the items for which the original U.S. position was to delete. (JOC Doc 1/3754 dated 5/7/54). It is not on the current U.S. list of items proposed for International control as prepared by the Ad Hoc Subcommittee on List Review and adopted by EDAC.)

B. Unilateral Control

The attached fact sheet shows that Western European production capacity is 343 million pounds per year, as compared with 425 million pounds in the United States, and that U.S. exports to Western Europe totalled 10.4 million pounds in 1956 and 17.5 million pounds in the first eight months of 1957 (data includes both phthalic anhydride and phthalate esters).

These proportions are such that U.S. unilateral controls would clearly be ineffective. In this connection, it should be noted that both France and Italy have included phthalic anhydride in their trade agreements with the U.S.S.R. (Moscow D-365 dated 1/16/58; Paris D-1267 dated 1/29/58; COCOM Doc 2942B dated 2/25/58)

Under these circumstances of trade and supply potential, and in view of the indirectness of the relationship of phthalic anhydride to military uses, and of the small proportion of strategic as against non-strategic uses, this commodity does not appear to qualify for unilateral embargo control by the United States.

Attachments:

1. Fact Sheet
2. Letter from Monsanto
3. Letter from Leslie Kleyman

Fact Sheet - Phthalic Anhydride March 1958

A. Description

Phthalic anhydride (P.A.) is one of the most important cyclic chemicals. It is produced either from coal tar (via naphthalene) or synthetically from petroleum (via orthoxylene). Some 60 - 70 million dollars worth are produced annually in the United States.

Actual U. S. production was 331.4 million lbs. in 1955, and 315.2 million lbs. in 1956.

B. Uses

P.A. is a major raw material used for the production of alkyd type surface coating resins (about 55%), esters for plasticizers (35%), an intermediate for a red coloring compound (5%), and miscellaneous other uses (5%).

The phthalate esters are produced by reacting P.A. with various alcohols.

C. Technology

Production of P.A. from naphthalene involves the processes of vaporizing, catalytic conversion, crystallization, and purification by distillation. The anhydride is then melted and flaked. In its production from orthoxylene, there is vaporization with excess air to avoid explosion, catalytic conversion, condensation, distillation and flaking. Esters are produced by reacting alcohols with P.A. in the presence of concentrated sulfuric acid.

Equipment required must be resistant to highly corrosive chemicals, and suitable for working with high pressure or under high vacuum. Heat transfer controls and other controls to keep pressures and temperatures to close tolerances are also necessary. Supervision of equipment must be under highly trained technicians to avoid explosions or the degradation of final products.

D. Strategic Uses

1. P.A. esters (phthalates) used as plasticizers give propellants certain desirable burning characteristics and keep the mixed, solid propellants in condition during storage as such or when incorporated in the shell or missile. (See Table 1.)

2. While peacetime usage in the U. S. is primarily for paints and plastics, the wartime pattern of 1944 shows 122 million lbs. of P.A. practically all allocated to military and other essential requirements. Of this amount 38 million went into alkyd surface coatings (largely paints) and 69 million were used for plasticizers for cable lacquer, insect repellants, and for single and double base propellants of the types shown in Table 1.

E. Substitutes

A recent survey of U. S. work in the field of solid propellants gives the following information on plasticizers:

1. Use of plasticizers

For plasticizing nitrocellulose type propellants, the phthalate esters used included the dimethyl, diethyl and dioctyl. Other plasticizers used are esters of acetic, adipic and sebacic acids as well as the solvents triacetin and diethylene glycol. Adiponitrile is also mentioned.

The JATO unit developed for the Air Force by Standard Oil Co. of Indiana, which was based on ammonium nitrate with cellulose acetate as a binder, used a variety of plasticizers, including the phthalates, triacetin, glycols and dinitrotoluene.

The survey states that the choice of plasticizer has an important effect on the ballistic properties of a propellant.

2. Types of plasticizers

Plasticizers listed in the current Plastics Encyclopedia for use by the plastics industry demonstrate the availability of many other possibilities. Specifically, those groups known to be useful in plastics include the following chemicals or their derivatives:

Abietic acid	Camphor	Ethers
Adipic acid	Caprylic acid	Ethylhexoi acid
Azelaic acid	Citric acid	Fumeric acid
Benzoic acid	Coconut oil	Glycerine
Biphemyl	Epoxy	Glycols
Hydrocarbons	Palmitic acid	Ricinoleic acid
Lauric acid	Paraffin	Sebacic acid
Maleic acid	Pelargonic	Stearic acid
Myristic acid	Pentaerythritol	Styrene
Naphthalene	Phosphoric acid	Succinic acid
Nitrile	Phthalic acid	Sucrose
Oleic acid	Polyesters	Sulfonic acid
		Tall oil
		Tartaric acid

Actually a list of over 300 specific chemicals is shown in the Encyclopedia and the unlisted other chemical combinations are infinite in number. About half of the 300 listed are phthalates, however, indicating the importance of this type of plasticizer for all uses, i.e., in plastics as well as propellants. For reasons of cost, availability and superior performance, the phthalates appear to be the most attractive both for military and nonmilitary uses.

E. 2. Continued:

Production of plasticizers in the U. S. is shown in Table 2. In 1955 over 212 million pounds of phthalates were produced out of 396 million of plasticizers. In 1956 the ratio was 237 out of 417 million. Production by type of phthalate is shown in Table 3.

F. Sources of Supply

1. World Production

Available data for the rest of the Free World indicate some 393 million pounds of capacity per annum as of 1956. This compares with an estimated 425 million for the U. S. in the same year. (Table 4).

By contrast, the 1954 Soviet Bloc production is reported at 40 to 46 million pounds, of which the U.S.S.R. had 15 to 22 million and East Germany most of the balance. Table 5 shows these estimates by country.

2. International Trade in Phthalate Anhydride and its Esters. (Tables 6 and 7).

Note: The full extent of such trade cannot be measured due to statistical classification difficulties. Some countries combine the anhydride with others, or the anhydride with its esters. Some countries show basket categories which include a number of related chemicals, thereby concealing the data completely.

G. Free World Trade with the Soviet Bloc

Recent shipments to the Soviet Bloc from Western Europe are shown in Table 6.

France and Italy have included phthalic Anhydride in trade agreements with the U.S.S.R.

A recent report indicates that a Dutch firm has a Russian order for 22 million pounds of P.A. The proposed source of this material is not known.

The U. S. licensed 1.3 million pounds for the U.S.S.R. in September 1957 and 200,000 pounds for Czechoslovakia in October. The U. S. rejected applications for an additional 2 million pounds for the U.S.S.R. in January 1958. A request to extend the time validity for 45 tons of the P.A. licensed to Czechoslovakia was also rejected in January.

H. Prior Years Control

Phthalic anhydride and its esters were formerly Item 3754 (MESL 4710; #B 709), but were deleted during the 1954 review.

I. Task Group Members

BFC	-	Messrs. R. Stewart, F. Magnuson, L. Kelston
BDSA	-	Mr. W. Lowe Walde
Defense	-	Mr. Fred Bates
AEC	-	Mr. Fred C. Lee
State	-	Mr. Thomas S. Strong

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TABLE 1

Propellants which require Phthalate Esters

(Illustrative Listing)

	Class and Description or Name		Propellant	
a.	Small arms - .30 light rifle:	-	Western Ball Powder	
b.	Guns	-	Single base powder	M1 M6
c.	Mortar	-	Double-base propellant	M8
d.	Rockets - Terrier sustainer	-	Double-base "O G K"	
	Terrier booster		Double-base "O I Y"	
	Nike booster		Double-base "O I Y"	
	Talos booster		Double-base "O I Y"	
	FFAR (Aircraft folding fin)		Double-base "N - 5"	

TABLE 2

U.S. Production of Plasticizers
1955-1956

(Millions of lbs.)

	1955	1956	Price per Pound 1956
Total	396	417	.32
Plasticizers, Cyclic Total	297	315	.30
Phosphoric acid esters	43	41	.32
Phthalic anhydride esters	213	237	.29
All other cyclic plasticizers 1/	41	37	.32
Plasticizers, Acyclic	100	101	.39
Adipic acid esters	11	9	.44
Azelaic acid esters 2/	-	10	.42
Glyceryl monoricinoleate	0.3	0.3	.32
Oleic acid esters	12	10	.32
Phosphoric acid esters	10	7	.43
Sebacic acid esters	9	11	.58
Stearic acid esters	10	11	.24
Triethylene glycol di(caprylate-caprate)	2	1	.41
All other acyclic plasticizers 2/	46	43	.37

NOTES: Data for 1956 are preliminary

1/ Includes data for synthetic camphor, certain phosphoric acid esters, toluene-sulfonamides, tetrahydrofurfuryl cleate, and other cyclic plasticizers.

2/ Includes data for citric and acetylcitric, azelaic, palmitic, tartaric, and ricinoleic acid esters, and for butyl myristate, glyceryl and glycol esters of certain fatty acids, glyceryl tripropionate, complex polymeric materials, and other scyclic plasticizers.

Source: U. S. Tariff Commission.

TABLE 3

U.S. Production of Phthalate Esters - 1955-1956
(Million lbs.)

Type of Phthalate	1955	1956
Dioctyl	30.6	31.0
Diethyl-hexyl	71.6	80.6
Diethyl	15.8	18.7
Dibutyl	23.9	22.0
Octyl decyl	13.1	11.3
Didecyl	5.1	7.7
Di isodecyl	4.0	9.3
Di methyl	4.0	4.0
Others	44.7	52.8
	212.8	237.4

(Phthalate anhydride represents about half the weight of phthalate esters.)

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TABLE 4

Free World Production Capacity for Phthalic Angydride (1956)

Country		Million Pounds
United States		425
Western Europe:		343
West Germany	127	
United Kingdom	96	
Italy	45	
France	40	
Other	35	
Other Free World:		50
Canada	20	
Japan	18	
Other	12	
		818

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TABLE 5

Soviet Bloc Production of Phthalic Anhydride (1954)

Country	Million Pounds
* East Germany	16.7
USSR	15.4 - 22.0
Czechoslovakia	4.4
Poland	3.1
	39.6 - 46.2

* Estimated 1956 Capacity 25 Million.

TABLE 6

Exports of Phthalic Acid and Phthalates
By W. Germany, Italy and France
1955, 1956 and January-July 1957
(Million lbs.)

	W. Germany			Italy			France*		
	1955	1956	1957	1955	1956	1957	1955	1956	1957
Totals	31.04	36.78	27.20	14.47	19.29	10.60	7.41	7.87	4.14
W. Germany	—	—	—	1.28	2.01	1.27	.21	N.A.	N.A.
Belgium	1.87	2.01	1.50	.08	—	.05	—	"	"
Denmark	2.20	1.79	1.25	—	—	—	.30	"	"
France	3.96	4.93	2.57	1.05	1.42	1.07	—	"	"
U. K.	2.10	1.97	0.59	3.28	3.64	1.42	3.73	"	"
Italy	1.93	2.39	0.77	—	—	—	—	"	"
Netherlands	3.78	3.32	2.29	.31	.34	—	—	"	"
Norway	2.06	2.18	1.53	.14	—	—	—	"	"
Sweden	2.45	3.76	3.31	.18	—	—	.28	"	"
Switzerland	3.82	3.76	2.59	.66	.90	.41	—	"	"
So. Africa	1.23	1.46	0.73	.40	—	—	—	"	"
U.S.A.	0.00	0.11	0.37	.71	.06	.30	.22	"	"
Australia	0.94	1.15	0.39	2.10	1.50	—	1.22	"	"
Soviet Bloc Destinations	0.37	2.60	3.15	.78	4.41	2.09	.55	"	"
Others	4.33	5.35	6.18	3.50	5.01	3.99	.90	"	"

* Exports by France are not available broken down by destination after 1955.

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TABLE 7

Phthalic Anhydride and Esters
U. S. Exports to Major Western European Destinations
(Million lbs.)

	Phthalic Anhydride		Phthalate Esters	
	1956	(8 mos.) 1957	1956	(8 mos.) 1957
W. Germany	0	2.2	0.8	1.0
Netherlands	0	4.3	0.4	0.7
U. K.	3.8	4.5	*	-
France	*	-	5.2	4.6
Sweden	0.2	0.3	-	*
Italy	*	-	*	*
Total	4.0	11.3	6.4	6.3

* Less than 50,000 lbs.

Attachment 2

cc Mrs. O. L. Foster
Washington, D. C.

MONSANTO CHEMICAL COMPANY
Overseas Division
St. Louis 24, Missouri

Sales Department

February 27, 1958

Bureau of Foreign Commerce
Department of Commerce
Washington 5, D. C.

Reference: Appeal B.F.C. case No. 150697

Gentlemen:

Reference is made to B.F.C. case No. 150697. This application for export license was recently rejected on the basis of "contrary to national interests." The product involved was Phthalic Anhydride for destination Russia. It is our desire to appeal your decision on the following basis:

1. Western European manufacturers of Phthalic Anhydride have regularly exported this product to Eastern Zone nations including USSR. As an example of this, there are the following number of Phthalic Anhydride manufacturers in these Western European countries who are sharing in such business:

West Germany	10	Switzerland	3
England	5	Italy	11
France	6	Denmark	1
Austria	2	Sweden	2
Belgium	2	Spain	4
Holland	1	Yugoslavia	1

Since we export to these Western European countries, who in turn export the Phthalic Anhydride to various Eastern European countries, it is our hope that we may obtain approval for exporting directly to Russia in this specific case at hand.

2. There is no difference from a national security stand point for European manufacturers to supply Russia and Satellite countries with Phthalic Anhydride and then supplement their needs by purchases from the U.S., than if the U.S. produced Phthalic Anhydride moves directly to these iron curtain countries. Russia, in either way, obtains the supply of Phthalic Anhydride she requires. We feel it is just as desirable for us to supply this material directly rather than have Russia buy Phthalic Anhydride from a West German, French or other continental producers, who would, in turn, purchase for his own use from the U.S.

We certainly hope that in consequence of these above facts, you will reconsider the previous rejection on this application for export license, and that you will approve the shipment.

Very truly yours,

JPSH/mb

J. P. S. Handy
Area Sales Supervisor
Overseas Division

Attachment 3

LESLIE KLEYMAN CORPORATION
183 Madison Avenue,
New York 16, N.Y.

March 3, 1958

U.S. Department of Commerce
Bureau of Foreign Commerce
Washington 25, D. C.

Gentlemen:

Earlier this year, we were negotiating for the sale of 500 tons of PHTHALIC ANHYDRIDE (Schedule B 80260) to the U.S.S.R. valued at $183,600. The export license application for this transaction - No. 176481 - was rejected.

The Vice-President of our firm, is currently in Europe on a business trip and reports to us that there has been considerable change in the Phthalic Anhydride situation since mid December, 1957, which is roughly the time we first submitted our license application. Prime producers of this material in England and in Germany, as well as in Japan, have substantially increased their production capacity to take care of the demand. The U.S.S.R. is, of course, purchasing from these sources at prices comparable to ours, and possibly lower. Actually, the main reason they are interested in buying from us is because they are most anxious to sell Pyridine to us.

It is with this motive in mind, the sale to us of Pyridine, that the customer has asked us to reinstate their order for Phthalic. We can, of course, market the Pyridine which is a commodity that is imported regularly. Phthalic Anhydride of American production is not moving easily to European markets because of the increased competition indicated above, whereas Pyridine is presently in short supply here in the States.

It would be greatly appreciated if you would consider our new application, herewith enclosed, in the light of these new developments. If we can supply further information, please let us know and we would be glad to answer by telephone, collect.

Very truly yours,

LESLIE KLEYMAN CORPORATION

/s/ P. Katz

Asst. to the Vice-President

PK:ms
Enc.