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Archer-Daniels-Midland
Outside White
Soya Oil in House Paint

Philadelphia Laboratory
September 29, 1947

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MEMORANDUM REPORT # M-145

ARCHER-DANIELS-MIDLAND COMPANY
SOYA 705 IN HOUSE PAINT

REFERENCE COPY

NOT FOR CIRCULATION

Soya 705 is a bodied soya bean oil in which the drying has been improved by a process of first, blowing the oil and then dehydrating it by heat. It comes in three viscosities, S, Z and Z-3. In the present investigation the S grade has been used as replacement for VO-8000, the bodied linseed oil used in house paint.

The sample used in the investigation is DS-17982 having a measured viscosity of T.

Summary and Conclusions:

The sample of soya 705 has been tested in the proposed formula for #40 Outside White and found to be a satisfactory replacement for VO-8000 as far as initial properties are concerned. The amount of bodied oil in this product is 25% of the total oil, or about 1 lb. per gallon.

When additional refined soya oil was used as a replacement for refined linseed oil to make the total soya content of the paint 62.5% of the total oil, the initial properties were still satisfactory.

The lead drier was doubled for both these soya containing products. The normal amount of lead drier was not tested. It is possible that a smaller amount of lead might be found satisfactory.

Since soya 705 is a blown oil, there is some question as to the durability of house paint containing it. There is an opinion in the trade that blown linseed oil is not as satisfactory as heat bodied linseed oil in house paint from the standpoint of cracking and ultimate durability. For determination of durability, the paints containing soya 705 are being placed on exposure series 9594.

There is no immediate need for a decision on the desirability of using this oil in house paint, since it is possible to use more than 25% of refined soya oil on the total oil without any question as to durability.

Details:

The composition of P-301-R-4318, the linseed control, is shown in Table I attached. DS-17982 Soya 705 was used as a direct replacement for VO-8000 in P-301-R-4320. An additional substitution of H-59, Refined Soya Oil for half of the H-19, alkali refined linseed oil, is made in P-301-R-4322.

The brushing of these paints is satisfactory, although none of them are quite as good as prewar 301-756 #40 Outside White. P-301-R-4320 containing Soya 705 in place of VO-8000 is slightly inferior to the all linseed control in ease of brushing, but the difference is very small. When the further soya substitution is made in P-301-R-4322, the brushing becomes as good as the control.

All the paints have satisfactory appearance, being equal to the prewar #40 control.

Results of the drying test are shown in Table II. Brushed films were dried both in the Constant Temperature Room at 77°F. and 50% relative humidity and in a cooler at 50°F. at high humidity. The drying is equal to the linseed control throughout and slightly better than the prewar #40 control.

Details of this work may be found in notebook 3381, pages 18 through 27.

PHILADELPHIA LABORATORY

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WFS:HFM

Table I - Composition of Outside White

		<u>Lb./100 gal.</u>	<u>Pigment Volume</u>
W - 5	TiPure-T	122	4.3
W - 3	TiPure-YCR	40	1.4
W - 18	35% leaded zinc oxide	445	10.5
W - 4	Asbestine	397	<u>18.8</u>
			35.0
H - 19	Refined linseed oil	318	
VO-8000	Linseed body S	106	
VM-7790	Soya lecithin solution	18	
VD-1428	Lead naphthenate	26	
VD-1846	Manganese naphthenate	4	
H -200	Thinner	<u>55</u>	
		1531	

Stormer - 90 KU

Table II - Drying

<u>Paint</u>	<u>Description</u>	<u>Constant temperature room</u>				<u>Cooler - 50°F.</u>	
		set-to- touch	residual tack	tack free	set-to- touch	residual tack	free
P-301-P-77879	Prewar 301-756	7 hr.	--	31 hr.	24 hr.	31 hr.	more than 78 hr.
P-301-R-4318	All linseed control	7 hr.	--	31 hr.	24 hr.	31 hr.	more than 78 hr.
P-301-R-4320	Soya 705 for VO-8000	7 hr.	--	31 hr.	24 hr.	31 hr.	more than 78 hr.
P-301-R-4322	Soya 705 & H-59; 62.5% Soya on total oil	7 hr.	31 hr.	48 hr.	24 hr.	48 hr.	more than 78 hr.