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Marshall Laboratory
April 13, 1953

MEMORANDUM REPORT NO. M-570

PREPARED BY: J. P. SERMATTEI

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NATIONAL LEAD CO.
SAFFLOWER OIL

INTRODUCTION:

On April 2, three National Lead Company representatives visited the Marshall Laboratory to discuss Safflower Oil. Incidentally there was also some discussion of two lead pigments, namely M-50, Basic Lead Silico-Chromate and 45-X-Basic Lead Silicate.

Present at the meeting representing National Lead Company were:

Walter Morris, Raw Material Sales Manager, Philadelphia
Karel Vettewinkel, Sales Manager, New York
Oscar Muller, Technical and Production Manager,
Philadelphia

N35470

Those present from Marshall Laboratory were:

J. W. Iliff
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R. J. Kluberton
O. R. Volk
C. G. Murphy
R. W. LaBerge
W. J. Hornibrook
C. D. Reinecker
P. J. De Marco
H. G. Stauffer
J. P. Sermattei
D. L. Herndon } present only for discussion
J. E. Oyler } of 45X-Basic Lead Silicate.

SUMMARY:

National Lead Company has had about five years experience with Safflower Oil, which was examined first at their West Coast plant. Based on this experience, they feel Safflower Oil is an excellent drying oil, which can advantageously replace Soya Oil and Linseed Oil in many paint applications.

National Lead Company is also a refiner of Safflower Oil, and they have a plant in the East that makes refined grades of Safflower Oil from crude oil that is shipped in from the Pacific coast. They said Safflower Oil production in 1952 totalled 250 tank cars and the 1953 production is expected to reach 350 tank cars. They felt that the future supply would continue to increase with increasing demand, but could give no estimates beyond 1953. The price at present for the non-break grade of Safflower Oil is 15¢ per pound in tank cars on the East Coast and they said the future price would probably be intermediate between that of Soya and Linseed Oils. They will accept contracts now for future delivery.

National Lead has a new lead chromate pigment under development that is called M-50 Basic Lead Silico-Chromate. Essentially, this is a lead chromate shell on a core of silica and it is claimed that this offers the advantages of straight lead chromate at a lower cost.

It was also stated that their 45-X Basic Lead Silicate pigment was finding wide acceptance in house paints and house paint primers. According to National Lead Company representatives, 45-X Basic Lead Silicate represents the most economic form in which lead oxide can be introduced as a pigment in a white paint or primer.

Samples of National Lead's non-break Safflower Oil and M-50 Basic Lead Silico-chromate are being obtained.

ACTION:

(1) J. P. Sermattei will compare National Lead Company's non-break Safflower Oil with the Pacific Vegetable Oil Corporation product.

(2) I. L. McGinnis will evaluate M-50 Basic Lead Silico-chromate as an economic replacement for lead chromate.

(3) S. L. Godshalk, K. C. Lampert and B. Morehead will evaluate M-50 Basic Lead Silico-Chromate in specific products.

(4) J. D. Pickens is requested to advise the writer whether he is interested in evaluating M-50 Basic Lead Silico-Chromate in automotive primers.

(5) D. L. Herndon has exposure data on 45-X Basic Lead Silicate in house paint primers, but no further action on this pigment is contemplated at this time.

DISCUSSION:

Safflower Oil

The National Lead Company people confirmed previous information that Safflower Oil dries like linseed and has color retention properties similar to soya bean oil. National Lead has 2-1/2 years exposure on Safflower Oil in house paint formulas in the San Francisco area, and these paints were whiter but slightly more brittle than corresponding linseed oil formulas. National Lead is not using Safflower Oil commercially in house paints, but is using it in some interior products.

Drying Properties

Safflower Oil has a longer induction period than linseed oil, but dries to about the same firmness overnight. The dried film is harder and somewhat more brittle than that of linseed oil. The same driers are used as with linseed and soya oils.

Color Retention:

Color retention was claimed to be superior to soya oil.

Brushability & Flow

Superior brushability and flow characteristics were also claimed.

Chemical Composition

Safflower Oil is chemically more homogeneous than other drying oils. It contains about 70% linoleic acid and a maximum of 2% linolenic acid. The oil has not been in production long enough to know how the composition may vary with different crop years.

Miscellaneous

The non-break grade of Safflower Oil is the lowest priced of the refined Safflower oils and this was said to be satisfactory for use in house paints and also for use in the manufacture of alkyd resins.

Safflower Oil can be cooked to a gel, which is dispersible in mineral spirits. This gelled Safflower Oil dispersion is useful as a bodying agent and grinding vehicle. It was said to increase the body of a paint without impairing brushability or flow.

M-50 Basic Lead Silico-Chromate

This is a new lead chromate pigment which is still under development. It has not yet been released for sale, but 3 years exposure results show it to be a promising replacement for straight lead chromate and red-lead at a considerable savings in cost. M-50 has a weight per gallon of 34.1 pounds and its price is tied to the price of pig lead according to the following formula: With pig lead at 19¢ per pound, B-50 is also priced at 19¢ per pound; 45% of any increase or decrease in the pig lead price carries over into the price of B-50.

45-X Lead Silicate

This white pigment has been on the market since 1945 and is finding increasingly wide use in white house paints and house paint primers. According to National Lead, 45-X Basic Lead Silicate is the most economical form in which a given amount of lead oxide can be introduced into a white paint product. This was not disputed, but there was some question as to whether the savings involved was sufficient to justify any change now in the formula of our house paint primer. This product now contains 3.4 pounds of basic lead carbonate per gallon, but is currently being revised to approximately one half this lead content.

National Lead Company people invited us to inspect their test fences at Sayville, Long Island, where they have Basic Lead Silico-Chromate under exposure in a number of vehicles and can also show us panels illustrating the use of 45-X Basic Lead Silicate in house paints and in house paint primers.

MARSHALL LABORATORY

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