

TEST FENCE INSPECTION

Trip report on Test Fence Inspection at National Lead Co. and Titanium Pigments, Sayville, Long Island, N. Y. 10/13/53

Mr. Harner, Mr. Heckman and I visited the National Lead and Titanium Pigments Test Fences at Sayville, Long Island, N. Y. on 10/13/53.

The National Lead Fences were inspected first.

1) Single Pigment Paints

- a) Oil base paints were shown of Lead Carbonate, Lead Sulfate, Zinc Oxide, Asbestine, Anatase Titanium and Zinc Sulfide,
- b) All applied three coats over cedar and exposed yearly since June 26, 1950.
- c) These show wood holding properties and mildewing.
- d) The white lead carbonate panels look best for wood holding. The lead sulfate is much poorer. The zinc pigments show typical cracking tendencies. The anatase titanium typical erosion. The asbestine while good for durability shows mildew collection.

2) Lead Pigments

- a) This is a basicity test and compares lead carbonate, lead sulfate at two PbO levels and 45X lead silicate.
- b) All applied three coats over yellow pine, white pine, cedar and cypress and exposed 11/13/50.
- c) 45X shows poor clean-up due they claim to photosensitivity. Lead carbonate shows characteristic checking which is also shown with 45X. Lead sulfate shows poorest wood holding properties.
- d) They claim test shows increased durability and adhesion as the basicity of the pigment increases.

3) Low Zinc Oxide Paints with Varying Amounts of Carbonate, Sulfate or 45X.

- a) This test was made primarily to see how low the zinc oxide content could be and still obtain a white which would show proper cleanup.
- b) 15% Zinc Oxide is the low limit for cleanup. Lower percentages show cleanup will not take place for at least one to two years, depending upon location (See National Lead book for formulas)
- c) Mildew is evidenced on those panels containing less than 10% Zinc Oxide regardless of the lead pigment present.
- d) Rate of chalking increases from lead carbonate to lead sulfate to 45X.

4) Primer Tests 45X Lead Silicate

- a) These tests show a comparison of the Federal Specification TT-P-25, lead carbonate and 45X replacing lead carbonate on a volume basis.
- b) 45X replaces lead carbonate at a decided savings (they figure 3# - 45X replacing 5# carbonate at a difference of 35¢)
- c) Wood holding properties show 45X equal to lead carbonate and better than TT-P-25 on the south exposures and better than either of the other primers on the north exposures.
- d) They claim some 800 paint companies are using 45X. These include Sherwin-Williams, Devoe, Sears, Montgomery-Ward, Pratt & Lambert and Benjamin Moore.
- e) It appears as though 45X could be used advantageously in an exterior house paint primer formulation. This is further borne out in the next series.

5) Additional 45X Primer Tests

- a) These tests enlarge those shown above. They include the National Lead MW 401 and a similar formula replacing lead carbonate with 45X.
- b) All primers are used under three different topcoats on both white and yellow pine. Exposed July 5, 1949.
- c) These tests again demonstrate better woodholding properties for 45X.

6) 45X House Paints

- a) This series includes tests on whites and gray tint paints.
- b) Starting with a typical carbonate, leaded zinc, titanium asbestos paint the sulfate in the leaded zinc is replaced with 45X and the Zinc Oxide as Acicular grade. In the second replacement a pound of Zinc Oxide is also replaced with 45X. In the third replacement all of the lead in the formula is replaced with 45X, also one pound of zinc oxide. The titanium is increased to bring it up to equal hiding.
- c) These replacements are made on two white formulations and three gray formulations.
- d) In order to show the cracking tendencies of Zinc Oxide and its counter action by 45X these tests were run. In other words they claim 45X reduces the reactivity of the Zinc Oxide and prevents the cracking failures.
- e) In the grays it was shown in addition to the above that a minimum of 2 1/2# of zinc oxide is necessary to prevent mildew. Using 2# of zinc oxide, mildewing started at the end of three years. (This work checks the tests at Du Pont on Zinc Oxide in that they believe at least 2 1/2# should be present in tints and deeper shades).

7) Additional 45X House Paints

- a) This series is similar to the above in that stepwise replacements are made for sulfate; sulfate and zinc oxide; sulfate, carbonate and zinc oxide.
- b) It again shows the effect of too high a Zinc Oxide content causing cracking.
- c) Also that cracking may be encountered if the 45X is increased too high.
- d) The effect of high inert as shown in Group III of this series, 35% Leaded Zinc/15% Anatase Titanium/35% Asbestine, is to produce mildew on the north exposures.

8) 45X House Paints - Staining Tests

- a) These panels were three coats self-primed. The Zinc Oxide in the base formula was decreased in half pound units. The lead sulfate portion of the leaded zinc was replaced stepwise with 45X on a volume basis.
- b) Panels had regular iron nails driven into them to show staining.
- c) In this series iron-staining was reduced as the zinc oxide content is also reduced. On the north exposures, mildew increases as the zinc oxide is reduced.
- d) There is apparently an optimum point between 2 and 2.6# Zinc Oxide for this particular formula.

9) Commercial Paints - Staining Tests

- a) This test includes the paints in the above series plus a number of others added. Both regular iron nails and copper screening were affixed to the finished panels.
- b) All of the competitive paints show staining to a greater or less degree from the iron. Most of the materials were resistant to copper staining with the exception of the lithopone type (Formula K was in this test.) Dutch Boy #210 Sash and Trim White did not show any staining. This is a long oil alkyd type.

10) Lorite in Camouflage Enamels

- a) Lorite is a calcium carbonate (85%)-diatomaceous silica (15%) inert. It was compared to asbestine on a volume basis in the typical camouflage colors. These paints were similar to those originally made during the war on a low oil basis.
- b) In every instance the replacement for asbestine using Lorite shows much improved color-retention.

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11) Dyphos and Bentone Paints

- a) Dyphos is bibasic lead phosphite. It is claimed to be an ultra violet light screening agent and are acid acceptor.
- b) These tests show the additions of Dyphos and Bentone, separately to the Pliolite and Parlon stucco white formulations.
- c) Based upon these tests, Dyphos improves color-retention in Pliolite and Parlon. It also retards checking. Bentone apparently retards checking also in these formulations.

12) Safflower Oil

- a) These tests show a comparison of raw linseed oil versus a 1/2 and 1/2 combination of raw linseed and non-break safflower oil in White Lead Paint and a ready mixed paint.
- b) Durability after 3 years' exposure is fully comparable.
- c) They have run a number of tests on safflower oil and find it very satisfactory from a durability standpoint in house paint formulations.

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