



M. VAN LOO
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#97 - Cont.

To continue the previous series of comparisons of the relative durabilities of various changes in SWP Gloss White since 1935, panels on the last seven revisions were prepared for exposure at Chicago.

Paints were prepared for exposure of the new Family Paint White using higher percentages of lithopone and leaded zinc with mica added, conserving Titanox RC.

Exposures of Barn Red after 16 months in Florida show no significant differences with various first coat reductions employing raw linseed oil, boiled oil, or FM oil compared with two coats of Rex 54 full body, or the two coat system of Commonwealth Barn Red Primer and Rex 54 top coat. The most important factor seems to be film thickness. Other exposures of Barn Red after 12 months in Florida show no significant difference between acicular zinc oxide and American zinc oxide 108 N additions.

Comparative grinding tests were made of recent TiO_2 production vs. 1403 T using the titanium oxides as the sole pigments in an SWP vehicle. The TiO_2 is more difficult to grind on a roller mill, has much lower consistency characteristics, but initial drying was satisfactory. The samples will be examined after a period of storage to determine relative tendencies toward absorption of drier.

#86 - Durability of Pigments with Special
Reference to Leaded Zinc and White Lead

Considerable time was spent during the month on the development of a lead-zinc exterior paint based on 414 W. Using varying proportions of 414 W and lead carbonate, the zinc oxide content varied from 34% to 46.5%. Checking tendencies are at least partially counteracted by the use of inerts, including mica, and p.v.c. at approximately 29%. Brightness is reduced. Exposures were prepared for Chicago and Coffeyville.

To prepare for any possible shortage of basic carbonate white lead a series of special paints have been prepared for exposure using 40 pounds of TiO_2 , and in one series 200 pounds BW 102 and in the second series no carbonate. In each group the only other opaque pigment is successively 414 W, 412, and 1526 dry. Using the lead carbonate the zinc oxide contents are 48%, 39%, and 34% respectively. With no lead carbonate the zinc oxide contents are 58%, 44%, and 41%, respectively. Mica was used to reduce checking tendencies. Brightness and hiding are below SWP standards.

Considerable improvement has been made in the color of 414 dry during the month. 414 W is the number now assigned to the cleaner, brighter pigment, which will be used in SWP tints and other formulas. A standard sample for 414 W was distributed but subsequent production has shown a still further improvement in color which considerably expands the possible scope of usage. All plants are asked to make all possible use of this pigment.

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Texture determinations were made on two samples each of 414 W, 1526 dry, and 412 dry, and grinding rates were determined using the standardized procedure, comparing 1526 dry and 414 W at equal poundage in an SWP tint base formula. The results were:

	<u>Texture</u>	<u>Paste Consistency</u>	<u>Grind</u>	<u>Production/Min.</u>
414 W Std.	6	9.2 sec.	4	172 grams
414 W Lot 183-1	6	7.6 "	4	169 "
1526 Lot 3591	6-3/4	11.2 "	4	188 "
1526 Lot 42	6	12.2 "	4	154 "
412 Lot 116	6-3/4	Not run	-	-
412 Lot 3581	6-5/8	Not run	-	-

#12 - Exterior Primers

Opacity brush-outs of Rex 450 SWP Undercoater showed definitely superior hiding power over Devoe's Undercoater. Therefore the opacity of Rex 450 was reduced 10% by adopting a formula carrying 55 pounds TiO₂, with 18% zinc oxide introduced as 414 W. Hiding remains better than Devoe's, Ward's, and Moore's primers, but under Sears' and Pittsburgh's primers.

Anticipating the necessity for eliminating (2281) from Rex 450 because of shortages of citicica oil, experimental formulas were prepared substituting V 17005 and (213) respectively. Regular Rex 450 set to touch in 6 hours, with replacement by (213) it set in 8 hours, while with 4 gallons of V 17005 the set to touch time was 6-1/2 - 7 hours and with 6 gallons of V 17005 about equal to regular formula. V 17014 gives too heavy body. The over night dry was satisfactory for all, with the (213) undercoater slightly soft.

In further studies of crawling, earlier tests were duplicated, and again the experimental Rex 450 formulas at higher p.v.c. were free from crawling when recoated with SWP Trimbrite reduced 50% with linseed oil. Further work is under way using the recent Rex 450 at 36.5%, 40%, and 42% p.v.c.

Sanding the dried 450 film eliminated crawling, as did the addition of a quarter pint of a 33% solution of Aerosol O.S. in alcohol to the gallon of top coat. The addition of a quarter pint of anhydrous alcohol also stopped crawling, but the evaporation produced an orange peel effect. There is also indication that the SWP Trimbrite formula with 15 gallons of (2281) did not crawl.

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#148 - Examination of White Lead

The January, 1942 Analytical Edition of the Journal of Industrial and Engineering Chemistry carries an article on the preparation of pigment mounts for microscopic examination, by dispersing the pigment in Duco Household Cement. This method is essentially the same as that demonstrated to members of this department by a member of the Anaconda Company's White Lead technical staff.

The pigment is dispersed by rubbing, with a spatula, a small amount of pigment in a drop of the cement on a microscopic slide. For details the original article may be consulted. It is a simple method with considerable merit - it is rapid and the mounts are quite permanent. However, some difficulty was experienced in obtaining a single layer of pigment particles with the entire field in sharp focus. This is essential for photography or for particle size measurement. Further work will be done, and if any entirely successful method is developed, details will be distributed as a report.

#103 - Metal Protective Paints

The rolling steel rod tests this month were confined to checking our results with those obtained by other workers in related fields. Results reported both in this country and in England showed that well orientated rust inhibiting fatty acid monolayers were possible with straight chain fatty acids having at least 6 carbon atoms to the molecule.

The following results were obtained:

<u>Fatty Acid</u>	<u>Carbon Atoms</u>	<u>Condition of Steel Rod</u>
Acetic	2	Bad corrosion
Propionic	3	" "
Butyric	4	Bad rust
Valeric	5	Slight rust
Caproic	6	Perfect
Heptylic	7	Perfect
Caprylic	8	Perfect
Lauric	12	Perfect
Stearic	18	Perfect
Oleic	18	Perfect
Control (no acid)	-	Bad rust

This series again shows that the 6 carbon atom fatty acid is the boundary line for protection. The tests were run at 0.1, 0.05, and 0.01 molar concentrations. For stearic acid these corresponded to solutions of 3%, 1-1/2%, and 0.3% as previously reported. For acids longer than caproic there was perfect protection even at 0.01 molar. The reported listed above refers to