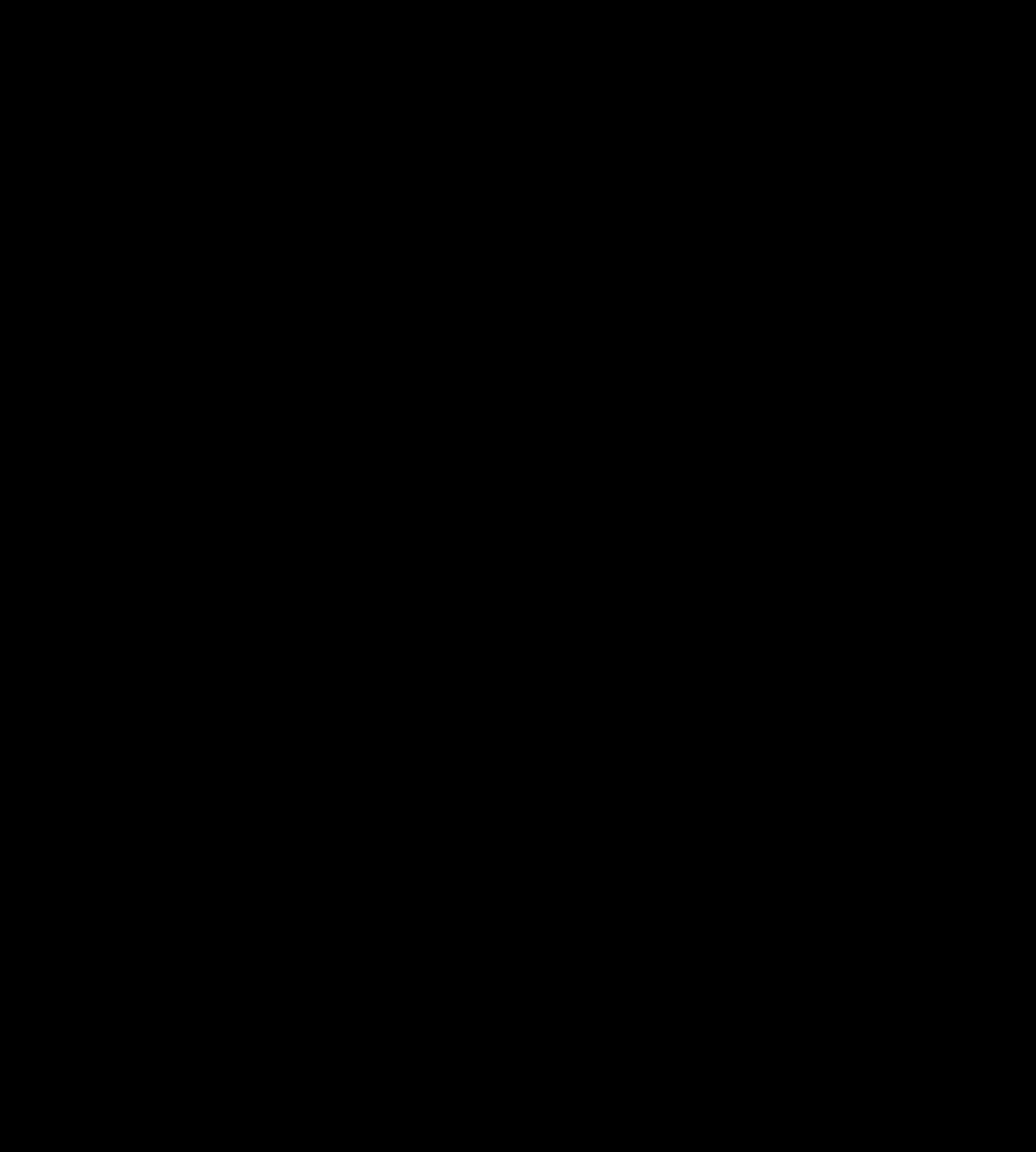




Paint Research Department, December 11, 1953

Second Progress Report, December 11, 1953

Titanium Pigment Corporation Cooperative Series (1951)

Purpose

To compare exposure results on white and tinted house paints, planned as an extension of a previous series, with special emphasis on comparison of results at our locations with those at Sayville, New York. A progress report was issued on September 24, 1952, at one year.

Paints Tested

Group 1 -- Fume Resisting House Paints

<u>Paint No.</u>	<u>TiO₂ Variation</u>
RB 3328	Titanox A/AA 50/50 blend
RB 3329	Titanox AA
RB 3330	Titanox A/RANC 75/25 blend
RB 3331	Titanox A/RCHT 50/50 blend

Group 2 -- Lead Containing Gloss White

<u>Paint No.</u>	<u>TiO₂ Variation</u>
RB 3299	Titanox A
RB 3300	Titanox A/AA 50/50 blend
RB 3301	Titanox A/RANC 82/18 blend
RB 3302	Titanox A/RCHT 50/50 blend

Group 3 -- Lead Containing Tint - Colonial Yellow

<u>Paint No.</u>	<u>TiO₂ - extender</u>
RB 3303 Y	Titanox RANC - Mg silicate
RB 3304 Y	Titanox RC - Mg silicate
RB 3305 Y	Titanox RANC - Ca carbonate
RB 3306 Y	Titanox RC - Ca carbonate

Group 4 -- Lead Containing Tint - Gray

<u>Paint No.</u>	<u>TiO₂ - extender</u>
RB 3303 G	Titanox RANC - Mg silicate
RB 3304 G	Titanox RC - Mg silicate
RB 3305 G	Titanox RANC - Ca carbonate
RB 3306 G	Titanox RC - Ca carbonate

0007-SWP-046039

0007-SWP-000115412

Group 5 - T.P. Co. White House Paints

Paint No.

- 1527-1 10% TxA MO-10% TxRA-38.5% PbZn-15.7% BCWL-25.8% Asb.
- 1527-2 10% TxA MO-10% TxRA 10-38.5% PbZn-15.7% BCWL-25.8% Asb.
- 1527-3 20% Tx A168 LO-38.5% PbZn-15.7% BCWL-25.8% Asb.
- 1527-4 The same paint as No. 2 with all the lead being replaced by 45X on a volume basis.
- 1527-5 7.5% TxA MO-7.5% TxRA 10-34.6% PbZn-14.7% BCWL-35.7% Asb.
- 1527-6 35% TxRCHT-10% TxA MO-50% PbZn-5% Asb.
- 1527-7 The same paint as No. 6 with all the lead replaced by 45X on a volume basis.
- 1527-8 25% TxRCHT-7.5% TxA MO-35% PbZn-32.5% Asb.
- 1527-9 15% TxA 168 LO-10% TxRA 10-35% ZnO-20% Asb.-
20% Calcium Carbonate.
- 1527-10 35% TxRCHT-10% TxA MO-35% ZnO-20% Asb.

Group 6 - T.P. Co. Tint Bases (Gray)

Paint No.

- 1527-11 13% TxRANC-38% ZnO-13% 45X-36% Calcium Carbonate
- 1527-12 12% TxRANC-35% ZnO-53% Calcium Carbonate
- 1527-13 53% TxRC-34.5% ZnO 12.5% Basic Lead Silicate 45X
- 1527-14 20% TxRC-25% ZnO-10% 45X-45% Calcium Carbonate
- 1527-15 Primer 60% TxRC-20% BCWL-20% Asb. in usual dehydrated
castor oil-linseed-ester gum vehicle at a PVC of 40%
- 1527-16 Primer - 65% TxRC-35% Asbestine in usual vehicle

0007-SWP-046040

0007-SWP-000115413

Preparation and Exposure

The paints are tested on cedar bevel siding as follows:

- a. The left 1/3 of each panel a control using house paint undercoater plus SWP Gloss White or the appropriate SWP tint.
- b. The center 1/3 of each panel a test topcoat over undercoater. (Undercoater for SWP groups is Rex 450. For T.P. Co. groups it is their #1527-15; but see also special T.P. Co. primer at end of list).
- c. The right 1/3 of each panel the same test as the center 1/3 but self-primed work.
- d. First coats at 450 sq. ft. per gallon, topcoats at 550.

The panels have been exposed 24 months at Miami, Florida, vertical south, and 24 months at Chicago, north and south vertical.

Summary of Results

Group I. Fume Resisting Whites

Normal at Florida, no failure, clean and white. Self-primed a little cleaner and whiter than Rex 450-primed, which seems to be a general trend. The only variation seen on the Chicago tests is a slight yellowness, with slightly more dirt and less erosion, on the Titanox A/RCHT blend.

Group II. Lead Containing Whites

Also no film failure at either location (Chicago erosion not yet serious). At Florida this group seems just slightly cleaner than Group I. The 82/18% Titanox A/RANC sample shows incipient erosion at Florida, and a little more than average erosion at Chicago. The Chicago tests, in general, tend to bear out the slight advantage in clean-up as compared with Group I.

Group III. Lead Containing Tint- Colonial Yellow

As for fading and chalk-masking, the two locations agree almost perfectly -- the Titanox RC/20 dry Mg silicate combination is best, RC/566 whiting is poorest, and RANC/20 dry (regular) and RANC/566 intermediate. At Chicago, the dirt collection tends to vary in the same way, and there are no other differences; therefore the general appearance ratings are in that order. At Florida checking is a serious factor, both RC samples showing much more checking than the RANC samples.

0007-SWP-046041

0007-SWP-000115414

Group IV. Lead Containing Tints - Westchester Gray

In general, the checking at Florida follows the same pattern as in the yellows. On the contrary, the pattern of fading of Group III does not show up on the Grays, which are badly chalk-masked, quite dirty and poor in appearance. The Chicago panels again show the RC/566 blend as undesirable because of a yellow chalk-face. However, the RC/Mg silicate blend, good in Group III, is adversely affected by this same yellow cast, apparently caused by the RC. It is very clearly demonstrated that a more chalk resistant titanium is still needed for use in tints.

Group V. Titanium Pigment Corporation Whites, with Titanium Pigment Corporation Primer #1527-15 (with 20% BCWL)

The details of differences in performance on these panels may best be seen in the readings, especially Florida.

In general we see an extension of the previously noted poor durability (checking) due to this primer, the self-primed sections being generally better. Also, as before, there is more dirt with lead-free than lead-containing paints, and more with larger amounts of rutile pigments. Rutile yellowing as such is not a problem at this stage.

Decreased use of lead-zinc and increased extender with A-MO/RA-10 (Paint #2 versus #5) shows increased checking.

A-MO/RCHT shows perhaps the worst checking and is very dirty.

A-MO/RA and the two samples using Al68-LO (#3 and #4) seem quite free of checking. However, Al68-LO blended with RA-10 (Paint #9) is poor in clean-up.

Group VI. Titanium Pigment Corporation Tints, Gray

This group as a whole, like the S-W Grays in Group IV, shows heavy chalk-masking and is generally unsatisfactory. Paint #14, high in calcium carbonate, shows clearly better color-retention than the others, but is very dirty and shows extensive checking. However, this is a light microscopic checking which resembles wrinkling and it may not indicate poor durability. Paint #12, also high in calcium carbonate, gives similar indications, fair color, but poor clean-up and questionable durability. Paint #13, using RC, zinc oxide and 45X basic silicate, seems to show the worst checking of the group.

0007-SWP-046042

0007-SWP-000115415

Group VII. (Supplementary)

Using Titanium Pigment Corporation Special Primer, 65/35% RC/Mg silicate, no BCWL Florida tests show a little checking with Rex 471 topcoat, not found with Rex 450 (Group I guide). However, Paint #9 with this primer seems satisfactory and Paint #10 looks better and shows less checking than as used with Rex 450. Chicago tests are not as far advanced, seem very similar to the parallels using Rex 450.

Examination Results

Examination at 24 Months, Florida

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Mildew Guide	Test	Dirt	Gen. App.
guide	Rex 450 plus Rex 471									
15835F	reg., all 1403, Left 1/3	3299	5	10	10		--	--	8	7-8
SWP Fume	Resisting									
36	Rex 436.	3328	5	10	10		7	6	7	6
36-2	50/50 TxA/AA "2's" all self-primed, otherwise as 36	3328	5	10	10		7	7	8	7
37	All TxAA	3329	6	10	10		7	6	7	6
37-2	Self-primed	3329	6	10	10		7	6	8	6
38	75/25 TxA/RANC	3330	6	10	10		8	6	7	6
38-2	Self-primed	3330	6	10	10		8	7	8	7
39	50/50 TxA/RCHT	3331	5	10	10		8	6	7	6
39-2	self-primed	3331	5	10	10		8	7	8	7
SWP Gloss White										
40	Rex 471 as guide	3299	6	10	10		7	7	7	7
40-2	Self-primed	3299	6	10	10		7	8	8	8
41	50/50 TxA/AA	3300	5	10	10		7	7	7	7
41-2	Self-primed	3300	5	10	10		7	7	8	8

0007-SWP-046043

0007-SWP-000115416

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Mildew Guide	Test	Dirt	Gen. App.
15842	82/18 TxA/RANC	3301	5	10	10		8	8	7	7
42-2	Self-primed	3301	5	10	10		8	8	8	8
43	50/50 TxA/RCBT	3302	6	10	10		8	8	7	7
43-2	Self-primed	3302	5	10	10		8	8	8	8
SWP Colonial Yellow										
Guide Reg. 450, White										
15844F	Rex 465 reg.	3303Y	6	9m*	10	4	--	--	7	5
45	Same, but center 1/3 (RANC + 20 dry)	3303Y	5	9m*	10	4	7	7	7	5
45-2	Self-primed	3303Y	5	9m*	10	4	7	8	8	5
46	TxRC/20	3304Y	6	3m	10	5	7	5	6	3
46-2	Self-primed	3304Y	6	3m	10	5	7	6	7	4
47	RANC/566	3305Y	5	8m	10	4	7	6	6	4
47-2	Self-primed	3305Y	5	8m	10	4	7	6	7	4
48	RC/566	3306Y	6	3m	10	3	6	5	6	4
48-2	Self-primed	3306Y	6	3m	10	3	6	5	7	4
SWP Westchester Gray										
49	Guide Rex 450 White, plus 477 Left 1/3	3303G	6	9m	10	4	--	--	7	4
50	Same but center (RANC-20 dry)	3303G	5	9m	10	3	5	4	6	4
50-2	Self-primed	3303G	5	7m	10	3	5	5	7	4
51	RC/20	3304G	6	4m	10	3	6	5	6	4
51-2	Self-primed	3304G	6	3m	10	3	6	6	7	4
52	RANC/566	3305G	7	8m	10	4	7	6	7	5
52-2	Self-primed	3305G	7	8m	10	3	7	6	7	4
53	RC/566	3306G	6	2m	10	3	6	6	6	4
53-2	Self-primed	3306G	6	2m	10	3	6	6	7	4

0007-SWP-046044

0007-SWP-000115417

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Mildew Guide	Test	Dirt	Gen. App.
T.P. Co. Paints, White										
Guide as 15835, but										
15854F	T.P.'s reg. primer	3299	5	7-9m	10		--	--	6	4-6
	1527-15 (left and center parts all this primer)	T.P. No.								
55	T.P. White, with Tx A-MO/RA	1527-1	4	10	10		5	3	5	3
55-2	Self-primed	1527-1	4	10	10		5	5	6	5
56	A-MO/RA-10	-2	5	8m	10		5	3	4	3
56-2	Self-primed	-2	5	8m	10		5	4	5	4
57	Tx A168-10	-3	4	10	10		5	3	6	4
57-2	Self-primed	-3	4	10	10		5	3	6	4
58	As 15858 but 45X	-4	5	10	10		5	3	5	4
58-2	Self-primed	-4	4	10	10		5	3	6	4
59	A-MO/RA-10 but lead-zinc changes	-5	5	3	8m		5	3	5	3
59-2	Self-primed	-5	5	part m 7m	10		5	4	6	4
60	RCHT/A-MO	-6	5	3	8m		7	4	7	4
60-2	Self-primed	-6	5	part m 7m	10		7	5	6	5
61	As 60, but 45X	-7	6	4 part m	8m		4	4	5	3
61-2	Self-primed	-7	6	8m	10		4	4	6	4
62	As 60, but more extender	-8	5	5m	8m		5	5	5	4
62-2	Self-primed	-8	5	6m	10		5	5	5	4
63	A168-10 and RA-10	-9	8	7m	10		4	2	4	2
63-2	Self-primed	-9	8	7m	10		4	2	4	2
64	RCHT/A-MO	-10	8	2m	10		5	3	4	2
64-2	Self-primed	-10	8	2m	10		5	3	3	2

0007-SWP-046045

0007-SWP-000115418

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Mildew Guide	Test	Dirt	Gen. App.
T.P. Co. Tints, Gray										
Guide as 49, but T.P. Co.										
15865F	Primer	RB 3303G	6	7m	10	3	--	--	5-7	4-5
66	T.P. Special RANC/45X/CaCO ₃ /ZnO	TP No. 1527-11	7	4m	10	3	5	6	6	4
66-2	Self-primed	-11	7	5m	10	3	5	6	6	4
67	RANC/ZnO/CaCO ₃	-12	9	2m	10	5	5	3	4	4
67-2	Self-primed	-12	9	2m	10	5	5	4	4	4
68	RC/ZnO/45X	-13	6	2	8m	3	5	5	6	4
68-2	Self-primed	-13	6	part m 3	8m	3	5	5	6	4
69	RC/ZnO/45X/CaCO ₃	-14	8	1m	10	5	5	3	4	4
69-2	Self-primed	-14	8	1m	10	5	5	3	4	4
T.P. White with Special Primer										
Guide as before, but T.P.										
70F	Special Primer, which is 65/35 RC/Asbestine	3299	4	8m	10		--	--	7	7-8
71	As 15863, but spec. pr.	TP No. 1527-9	7	8m	10		5	3	4	3
71-2	Self-primed	1527-9	7	8m	10		5	3	4	3
72	As 15864, but spec. pr.	-10	7	6m	10		5	3	6	5
72-2	Self-primed	-10	7	7m	10		5	4	6	5

0007-SWP-046046

0007-SWP-000115419

Examination at 24 Months, Chicago

Panel No.	RB No.	SOUTH					Gen. App.	NORTH					Gen. App.
		Gloss	Chalk	Eros'n	Fade	Dirt		Gloss	Chalk	Eros'n	Fade	Dirt	
15835C	3299	0	6	8		7	7	0	5	9		6	6
36	3328	0	6	8		8	8	0	5	8		7	7
36-2	3328	0	6	7		8	8	0	5	8		7	7
37	3329	0	6	8		7	7	0	5	8		6	6
37-2	3329	0	5	7		7	8	0	5	8		6	6
38	3330	0	7	8		7	7	0	7	9		7	7
38-2	3330	0	7	7		7	8	0	7	9		7	8
39	3331	0	6	8		6	6	0	6	10		5	5
39-2	3331	0	6	8		7	7	0	6	10		5	5
40	3299	0	6	8		7	7	0	5	9		6	6
40-2	3299	0	6	7		8	8	0	5	9		7	6
41	3330	0	6	8		7	7	0	6	9		6	6
41-2	3300	0	5	8		8	8	0	5	8		7	6
42	3301	0	5	8		7	7	0	5	8		7	7
42-2	3301	0	5	7		8	8	0	5	8		7	7
43	3302	0	6	8		7	7	0	6	9		6	6
43-2	3302	0	6	8		8	8	0	5	9		7	6
44	3303Y	0	6	10	4	6	5	0	7	10	5	4	4
45	3303Y	0	6	10	5	6	6	0	7	10	6	5	5
45-2	3303Y	0	6	10	4	6	5	0	7	10	5	5	4
46	3304Y	0	6	10	6	6	6	0	6	10	7	4	5
46-2	3304Y	0	6	10	5	6	6	0	6	10	6	4	5
47	3305Y	0	7	10	5	6	6	0	7	10	6	5	5
47-2	3305Y	0	7	10	4	6	5	0	7	10	5	5	4

Dirt north is largely mildew on ti

0007-SWP-046047

0007-SWP-000115420

Panel No.	RB No.	SOUTH					Gen. App.	NORTH					Gen. App.
		Gloss	Chalk	Eros'n	Fade	Dirt		Gloss	Chalk	Eros'n	Fade	Dirt	
15848	3306Y	0	8	10	3	4	3	0	7	10	3	3	2
48-2	3306Y	0	7	10	3	4	3	0	7	10	3	3	2
49	3303G	0	6	10	5	7	6	0	7	10	5	5	5
50	3303G	0	6	10	5	7	6	0	6	10	4	6	5
50-2	3303G	0	6	10	4	8	6	0	6	10	4	6	5
51	3304G	0	6	10	6	5	5	0	6	10	5	4	4
51-2	3304G	0	6	10	5	6	6	0	6	10	5	4	4
52	3305B	0	7	10	6	5	5	0	7	10	6	5	5
52-2	3305B	0	7	10	5	6	5	0	7	10	6	6	6
53	3306G	0	7	10	6	4	4	0	6	10	4	4	4
53-2	3306G	0	7	10	5	4	4	0	6	10	4	4	4
54	3299	0	6	8		7	7	0	6	10		6	6
55	1527-1	0	6	7		6	6	0	6	10		5	5
55-2	1527-1	0	6	6		7	7	0	6	10		6	6
56	1527-2	0	6	8		5	6	0	6	10		5	5
56-2	1527-2	0	6	7		6	6	0	6	10		6	6
57	1527-3	0	5	7		6	6	0	5	8		7	7
57-2	1527-3	0	5	6		7	6	0	5	7		7	7
58	1527-4	0	6	8		5	6	0	6	9		5	6
58-2	1527-4	0	6	7		6	6	0	6	8		6	6
59	1527-5	0	7	6		6	6	0	7	9		5	5
59-2	1527-5	0	7	5		7	7	0	7	8		6	6
60	1527-6	0	5	8		6	6	0	5	10		4	5
60-2	1527-6	0	5	8		7	7	0	5	10		6	6
61	1527-7	0	5	8		5	5	0	5	10		4	5
61-2	1527-7	0	5	8		6	6	0	5	10		5	6
62	1527-8	0	7	7		6	6	0	8	9		5	6
62-2	1527-8	0	7	6		7	7	0	7	6		7	5

0007-SWP-046048

Panel No.	RB No.	Gloss	Chalk	SOUTH			Gen. App.	Gloss	Chalk	NORTH			Gen. App.
				Eros'n	Fade	Dirt				Eros'n	Fade	Dirt	
15863	1527-9	0	7	8		5	6	0	6	10		4	5
63-2	1527-9	0	6	7		6	6	0	6	9		5	5
64	1527-10	0	6	8		5	5	0	5	9		4	5
64-2	1527-10	0	6	8		6	6	0	5	8		5	6
65	33034	0	7	10	4	8	6	0	7	10	4	6	5
66	1527-11	0	8	9	6	5	5	0	8	10	6	4	5
66-2	1527-11	0	8	9	5	6	6	0	8	10	6	4	5
67	1527-12	0	8	8	6	5	5	0	9	10	7	3	4
67-2	1527-12	0	8	8	5	6	5	0	9	10	7	4	5
68	1527-13	0	7	9	5	6	5	0	7	10	5	5	5
68-2	1527-13	0	7	9	4	7	5	0	7	10	5	6	6
69	1527-14	0	8	5	6	4	3	0	9	7	7	2	3
69-2	1527-14	0	7	6	6	5	5	0	9	9	7	3	4
70	3299	0	6	8		7	7	0	6	8		6	6
71	1527-9	0	6	8		5	6	0	6	9		4	5
71-2	1527-9	0	6	6		6	7	0	6	8		5	5
72	1527-10	0	5	8		6	6	0	5	8		5	5
72-2	1527-10	0	5	7		7	7	0	5	8		6	6

There is no checking or cracking on any Chicago panels.

0007-SWP-046049

0007-SWP-000115422

General Comments

This series shows the checking on tints which has been so noticeable in recent years at Florida. Furthermore, due to the wide variations in checking with the titanium changes, it seems to indicate that the titanium pigment is a major factor, perhaps associated with the extender used in the titanium calcium form. Titanox RC, which uses calcium sulfate, seems to be particularly bad in this respect, and also shows bad fading. Calcium carbonate as extender and 45X basic silicate white lead seem to reduce checking. 45X seems to help clean-up, but calcium carbonate appears to have the opposite effect. As said before, there is a real need for a more chalk resistant form of titanium dioxide than is currently available for use in tints.

Formulas Involved

SWP Undercoater - Rex 450 - RB 3322

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100		2077
250		20
240		511
120		18
142		2174
3		547
	3/4	(5094)
	28	(2)
	14-1/2	(310)
	4	(141)
	1-1/2	(901)
	1-1/2	(543)
	25	(348)

Wt./Gal. - T 13.73 - A 13.80
Viscosity 19" @ 75 deg. on #3

Tint Base - RB 3306

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
325		2140 Titanox RC
230		566
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	11	(5027)

Wt./Gal. - A 15.16
Viscosity 33" @ 75 deg. on #3

0007-SWP-046050

0007-SWP-000115423

Tint Base - RB 3305

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
137	1004	Titanox RA NC
375		566
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	1/4	(5027)

Wt./Gal. - T 14.65 - A 14.61
Viscosity 23" @ 75 deg. on #3

Tint Base - RB 3304

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
325	2140	Titanox RC
200		20
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	13	(348)

Wt./Gal. - T 15.00 - A 15.02
Viscosity 37" @ 75 deg. on #3

Tint Base - RB 3303

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
137	1004	Titanox RA NC
325		20
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	17	(5027)

Wt./Gal. - T 14.38 - A 14.31
Viscosity 22" @ 75 deg. on #3

SWP Gloss White RB 3302

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
250		20
175	2132	Titanox RC HF
100	1403	Titanox A
200		412
200		1424
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	15-3/4	(348)

Wt./Gal. - T 14.46 - A 14.50
Viscosity 26" @ 75 deg. on #3

0007-SWP-046051

0007-SWP-000115424

SWP Gloss White - RB 3301

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
30	1004	- Titanox RA RC
140	1403	- Titanox A
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.23
 Viscosity 21" @ 75 deg. on #3

SWP Gloss White - RB 3300

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
85	1403	- Titanox A
85	2030	- Titanox AA
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.30
 Viscosity 25" @ 75 deg. on #3

SWP Gloss White - RB 3299

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
170	1403	- Titanox A
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.31
 Viscosity 25" @ 75 deg. on #3

Fume Resisting White - RB 3328

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100	1403	- Titanox A
100	2030	- Titanox AA
290		2059
288		20
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)
	4	(348)

Wt./Gal. - T 13.29 - A 13.33
 Viscosity 42" @ 75 deg. on #3

0007-SWP-046052

0007-SWP-000115425

Fume Resisting White - RB 3330

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
126	1403	- Titanox A
42	1004	- Titanox RA NC
290		2059
314		20
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T 13.22 - A 13.23
Viscosity 41" @ 75 deg. on #3

Fume Resisting White - RB 3329

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
290		2059
288		20
200		2030 - Titanox AA
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)
	3	(348)

Wt./Gal. - T 13.29 - A 13.31
Viscosity 41" @ 75 deg. on #3

Fume Resisting White - RB 3331

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
290		2059
112		20
75		1989
246	2132	- Titanox RC HT
74	1403	- Titanox A
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T - 13.48 - A 13.45
Viscosity 32" @ 75 deg. on #3

JWC:ls

J. W. CHAPIN

0007-SWP-046053

0007-SWP-000115426

Project #97
SWP

Paint Research Department - January 19, 1954

Progress Report on Exposures 16046-16115 F,C
and 18502-25 C,F

du Pont-Sherwin Williams Cooperative Series of 1951

Previous Report -- September 29, 1952

Purpose

To compare outdoor exposure results at our locations with those at Wilmington, Delaware, as exposed by the du Pont Pigment Division. Paints testing various Ti-Pure and Ti-Cal pigments in SWP White, Colonial Yellow and Westchester Gray were made by us. Somewhat similar formulations were made by du Pont, their accent being mainly on variations in amounts of lead and zinc pigments and the use of their bodied linseed oil versus ours. These paints were interchanged and both sets painted out and exposed by each.

Paints Tested

Sherwin-Williams paints tested are as follows:

Group 1. Fume Resisting House Paints

<u>Paint No.</u>	<u>TiO₂ Variation</u>
HB 3307R	Ti-Pure FF/YCR 50/50 blend
3308R	Ti-Pure YCR
3309	Ti-Pure FF/R-610 75/25 blend
3310	Ti-Pure FF/Ti-Cal R-27 50/50 blend

Group 2. Lead Containing Gloss White

<u>Paint No.</u>	<u>TiO₂ Variation</u>
RB 3401	Ti-Pure FF
3312R	Ti-Pure FF/YCR 50/50 blend
3313	Ti-Pure FF/R-610 82/18 blend
3314	Ti-Pure FF/Ti-Cal R-27 50/50 blend

Group 3. Lead Containing Tint - Colonial Yellow

<u>Paint No.</u>	<u>TiO₂ - Extender</u>
RB 3400Y	Ti-Pure R-610 - Mg silicate
3402Y	Ti-Cal R-60 - Mg silicate
3317Y	Ti-Pure R-610 - Ca carbonate
3403Y	Ti-Cal R-60 - Ca carbonate

0007-SWP-046054

0007-SWP-000115427

Group 4. Lead Containing Tint - Gray

<u>Paint No.</u>	<u>TiO₂ - extender</u>
RB 3400G	Ti-Pure R-610 - Mg silicate
3402G	Ti-Cal R-60 - Mg silicate
3317G	Ti-Pure R-610 - Ca carbonate
3403G	Ti-Cal R-60 - Ca carbonate

The du Pont paints may be described as follows:

<u>Formula</u>	<u>Description</u>	<u>Lb/Gal.</u>
TTP-25a	Primer - R-610/BCWL/BSWL/Mg sil.	
1	Ti-Pure FF/35% ZnO/Mg sil.	1.27/4.24/2.97
1A	ditto, but using S-W (310)	
2	Ti-Pure FF/35% ZnO/Ca CO ₃	1.50/2.55/5.99
3	Ti-Pure FF/YCR/35% ZnO/Mg sil.	.90/.90/4.24/2.58
3A	Ditto, but using S-W(310)	
4	Ti-Pure FF/YCR/Acic. ZnO/Mg sil.	.96/.96/2.76/2.99
4A	Ditto, but using S-W (310)	
5	Stain resistant Ti-Pure FF/Mg sil.	2/3.7
<u>Colonial Yellow</u>		
206	Ti-Pure R-610/Acic. ZnO/Ca CO ₃	1.2/2.54/5.51
206A	Ditto, but using S-W (310)	
207	Ti-Pure R-610/Acic. ZnO/Ca CO ₃	1.42/1.00/7.36
<u>Gray Tint</u>		
106	Ti-Pure R-610/Acic. ZnO/Ca CO ₃	1.2/2.54/5.51
106A	Ditto, using S-W (310)	
107	Ti-Pure R-610/Acic. ZnO/Ca CO ₃	1.42/1.00/7.36

0007-SWP-046055

Preparation and Exposure

The paints are tested on cedar bevel siding as follows:

1. The left 1/3 of each panel a control using Rex 450 SWP Undercoater (with one exception) plus SWP Gloss White or the appropriate tint.
2. The center 1/3 of each panel Rex 450 plus a test paint.
3. The right 1/3 of each panel the test paint self-primed.
4. All prime coats spread at 450 sq. ft. per gallon; all topcoats at 550.
5. Our tests have been exposed at Florida, vertical south, for 24 months and at Chicago, north and south, for 22 months.

Addendum

We are incorporating into this report the results to date of our series 18502-25 C,F, a repeat of part of the above series. See Mr. R. R. Bruhn's letters to Dr. W. G. Vannoy, October 1, 1952 and October 16, 1952 and Dr. Vannoy's letter to Mr. Bruhn, November 3, 1952. As stated in the previous report, we were unable to identify certain paints of the original series with certainty, and therefore made repeat tests as listed below. These exposures have been on test 6 months at Florida, vertical south and the same at Chicago, north and south, the preparation and woods used following the original specifications.

List of repeated systems:

<u>Panel</u>	<u>Paint or System</u>	<u>Supplementing</u>
18502	RB 3401RR regular Rex 471 over Rex 450 Undercoater, guide paint	Panel 16046, original O.K.
18503	Same	16047, original O.K.
18504	Same, but self-primed	16048, original O.K.
18505	RB 3312RR, 50/50% FF/YCR, over Rex 450	16057, original O.K.
18506	RB 3312RR, 50/50% FF/YCR, self-primed	16058, original O.K.
18507	RB 3313RR, 82/18% FF/R610, over Rex 450	16059, original O.K.
18508	RB 3313RR, 82/18% FF/R610, self-primed	16060, original O.K.

0007-SWP-046056

0007-SWP-000115429

<u>Panel</u>	<u>Paint or System</u>	<u>Supplementing</u>
18509	RB 3314RR, 50/50% FF/R27, over Rex 450	16061, original O.K.
18510	RB 3314RR, 50/50% FF/R27, self-primed	16062, original O.K.
18511	du Pont #1, FF/Pb-Zn/Mg sil., over Rex 450	16084, original questionable
18512	du Pont #1, FF/Pb-Zn/Mg sil., self-primed	16085, original questionable
18513	du Pont #2, CaCO ₃ for Mg sil., over Rex 450	16088, original questionable
18514	du Pont #2, CaCO ₃ for Mg sil., self-primed	16089, original questionable
18515	du Pont #3, FF/YCR/Pb-Zn/Mg sil., over Rex 450	16090, original questionable
18516	du Pont #3, FF/YCR/Pb-Zn/Mg sil., self-primed	16091, original questionable
18517	du Pont #4, ZnO for co-fumed, over Rex 450	16094, original questionable
18518	du Pont #4, ZnO for co-fumed, self-primed	16095, original questionable
18519	du Pont #5, FF/Mg sil., no Pb-Zn, over Rex 450	16098, original questionable
18520	du Pont #5, FF/Mg sil., no Pb-Zn, self-primed	16099, original questionable
18521	RB 3401RR as above, but over TTP-25a	16081A, original questionable
18522	du Pont #1, as above, but over TTP-25a	16082, original questionable
18523	du Pont #1, as above, self-primed	16083, original questionable
18524	du Pont #5, as above, but over TTP-25a	16100, original questionable
18525	du Pont #5, as above, self-primed	16101, original questionable

Summary of Results

(a) Original series 16046-16115, two years.

There is still no checking or cracking failure on any of the white tests, with one exception: du Pont #5, leadless, shows slight microscopic checking at Florida, and this is somewhat more pronounced self-primed and over TTP-25a than over Rex 450. Erosion does show slight variations at Chicago, but there is no appreciable effect on appearance, therefore no conclusions are attempted at present.

0007-SWP-046057

0007-SWP-000115430

The dirt collection is largely mildew on the Florida panels, with occasional cases of ordinary dirt predominating; whereas the trend at Chicago is just the opposite. Because there are so many differences which are slight but possibly significant, only a few of the outstanding cases can be mentioned here; details should be sought in the complete readings. The tests looking cleaner and better than the guide at both locations are: S-W Rex 436 leadless (but not particularly so with YCR); RB 3312R, 50/50 FF/YCR; du Pont #1 and #1A. The serious mildew and dirt on the guide, which caused concern last year, still persists. Samples which seem consistently more dirty than the guide, or otherwise unsatisfactory in appearance, are: RB 3310R, FF/R27 in leadless type, dirt and yellow cast (less noticeable in the regular formula RB 3314); du Pont #2 with CaCO_3 , probably the only real stand-out in unsatisfactory clean-up; du Pont #5, but not over Rex 450. There seems to be a peculiar condition of scattered mildew growth on the S-W guide formula, all FF titanium, at Chicago only.

In the tints, the du Pont samples again show an advantage in color because of a deeper "undertone," although in many cases showing fully as much dirt and in some cases nearly as much chalk-mask as the S-W samples. RB 3317, with R610 and CaCO_3 , is one of the few variations to stand out as an improvement in color, mainly in yellow rather than gray. However, it should be noted that all tests are better in color than the regular S-W guide using R-610 and Mg silicate. There is no failure on the tints at Chicago. At Florida, there is microscopic checking on most tests. Calcium carbonate seems to result in more checking than magnesium silicate in the S-W group, which shows more in general than the du Pont group.

(b) Supplementary Series 18502-25, 6 months.

The differences in this group so far involve gloss, chalking and the early stages of self-cleaning. Straight FF titanium formulas seem to be consistently more free in chalking (consequently less gloss is apparent), while the only material which is at all outstanding in retardation of chalking is YCR. This and R-610 show definitely slower clean-up than the others. There is no evidence so far of any inconsistency in performance of the guides.

All panels continue on exposure.

Examination results follow.

0007-SWP-046058

0007-SWP-000115431

Original Series

Examination at 24 Months, Florida

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Dir ⁺ Guide	Test	Gen. App.
Guide Rex 450-471, all FF, 16046	Left 1/3	3401	8	10	10		--	--	4-5
47	450-pr. Rex 436	3307R	6	10	10		4D	6	6
48	50/50 FF/YCR Same, self-pr.	3307R	6	10	10		4D	6	7 (whiter)
49	Rex 436, all YCR	3308R	6	10	10		5	6	6
50	self-primed	3308R	6	10	10		5	6	7
51	25/75 R610/FF	3309R	7	10	10		5	7	7
52	self-primed	3309	6	10	10		5	7	7
Some erosion, but very hard to judge any diff's. (Guide + 55-6 least)									
53	50/50 FF/R27	3310	6	10	10		5	6D	6 yellow
54	self-primed	3310	6	10	10		5	7D	7 yellow
55	Rex 471, all FF (as guide)	3401	8	10	10		4	4	5 whiter
56	self-primed	3401	8	10	10		4	4	5
57	50/50 FF/YCR	3312R	6	10	10		5	7	7
58	self-primed	3312R	5	10	10		5	7	7
59	82/18 FF/R610	3313	7	10	10		5	7	7
60	self-primed	3313	6	10	10		5	7	7
61	50/50 FF/R27	3314	7	10	10		5	6D	6D
62	self-primed	3314	6	10	10		5	6D	6D
Colonial Yellow									
Guide Rex 465 over 450 16063	R-610 + Mg sil.	3400Y	6	10	10	3	--	--	4-5
64	Same, center	3400Y	6	10	10	3	7	7	4
65	Self-primed	3400Y	6	10	10	3	7	7	4

*Dirt is mostly mildew. "D" indicates regular dirt also.

0007-SWP-046059

0007-SWP-000115432

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Dirt Guide	Test	Gen. App.
16066	R-60 + Mg sil.	3402Y	7	4m	10	5	6	5	5
67	Self-primed	3402Y	7	very tiny	10	4	6	5	5
68	R610 + CaCO ₃	3317Y	7	3m	10	6	7	4	5
69	Self-primed	3317Y	7	very tiny	10	4	7	4	4
70	R60 + CaCO ₃	3403Y	6	6m	10	5	7	5	5
71	Self-primed	3403Y	6	very tiny	10	4	7	5	3
Chelsea Gray									
16072	Rax 474 over 450 R610, Mg sil.	3400G	6	10	10	2	--	--	2
73	Same, center	3400G	7	10	10	2	6D	6	2
74	Self-primed	3400G	7	10	10	2	6D	6	2
75	R60 + Mg sil.	3402G	7	10	10	3	6	4D	2
76	R60 + Mg sil.	3402G	7	10	10	3	6	4D	2
77	R610 + CaCO ₃	3317G	7	7m	10	3	6	4D	2
78	R610 + CaCO ₃	3317G	7	6m	10	3	6	4D	2
79	R60 + CaCO ₃	3403G	7	10	10	4	6	5	3
80	R60 + CaCO ₃	3403G	7	8m	10	4	6	5	3
du Pont Samples									
16081	Guide, same as 16046	3401	7	10	10	--	--	--	4-6
81FA	Same, but TTP-25a primer	3401							
82	FF/35% ZnO/Mg over spec.	#1	4	10	10		4D	6	6
83	Same, self-primed	#1	4	10	10		4D	6	7
84	Ditto, but over 450	#1	4	10	10		4	5	5
85	Self-primed	#1	4	10	10		4	6	6
86	As #1, but S-W (310)	1A	4	10	10		4	6	6
87	Self-primed	1A	4	10	10		4	7	7

0007-SWP-046060

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Dirt Guide	Test	Gen. App.
16088	As #1, but CaCO_3	2	7	10	10		3	2D	2
89	Self-primed	2	6	10	10		3	3D	3
90	FF/YCR/ZnO/Mg sil.	3	4	10	10		5	6	6
91	Self-primed	3	4	10	10		5	6	6
92	As #3, but S-W (310)	3A	4	10	10		5	6	6
93	Self-primed	3A	4	10	10		5	6	6
94	FF/YCR/Acic. ZnO/Mg sil.	4	6	10	10		5	6	6
95	Self-primed	4	6	10	10		5	6	6
96	As #4, but S-W (310)	4A	5	10	10		5	6	6
97	Self-primed	4A	5	10	10		5	6	6
98	Stain Resist. FF/Mg sil.	5	8	7m	10		4	5D	5 Gray
99	Self-primed	5	8	6m	10		4	3D	3
16100	As 16098, but TTP primer	5	8	5m	10		4	3D	3
01	Self-primed	5	8	4m	10		4	3D	3
A very "light" shallow type of checking									
Colonial Yellow									
Guide	Rex 465,								
16102	as 16063	3400Y	5	10	10	3	--	--	4
03	du Pont's with R610 over 450	206	7	8m	10	6	6	6	6
04	Self-primed	206	8	7m	10	5	6	5	5
05	As 206 but S-W (310)	206A	7	6m	10	6	5	5	5
06	Self-primed	206A	8	6m	10	6	5	4	4
07	As 206, but def. lower ZnO.	207	9	9m	10	6	6	4	4
08	Self-primed	207	9	9m	10	7	6	3	3
very tiny									
Chelsea Gray									
Guide	As 16102, but gray	3400G	6	10	10	2	--	--	2
16109	As 16103, but gray	106	8	6m	10	5	6D	4	4
10	As 16104, but gray	106	8	5m	10	5	6D	4	4
11	As 16104, but gray			very tiny					

0007-SWP-046061

Panel No.	Description	RB No.	Chalk	Check	Crack	Fade	Guide	Dirt Test	Gen. App.
16112	As 16105, but gray	106A	8	8m	10	4	6	4	3
13	As 16106, but gray	106A	8	very tiny 7m	10	4	6	5	3
14	As 16107, but gray	107	9	very tiny 10	10	6	6	5	4
15	As 16108, but gray	107	9	very tiny 10	10	6	6	5	4

Original Series

Examination at 22 Months, Chicago

Panel No.	RB No.	Chalk	SOUTH			Gen. App.	Chalk	NORTH			Gen. App.
			Eros'n	Fade	Dirt			Eros'n	Fade	Dirt	
Guide 16046	3401R	6	9		6M	6	6	10		5M	5
47	3307R	8	8		8	8	8	9		7	7
48	3307R	8	8		8	8	8	9		7	7
49	3308R	7	8		8	8	7	9		7	7
50	3308R	7	8		8	8	7	9		7	7
51	3309	8	8		8	8	8	9		7	7
52	3309	7	8		8	8	8	9		7	7
53	3310	8	8		7	7	8	9		6	6
54	3310	7	8		7	7	8	9		6	6
55	3401	6	9		6M	6	6	9		5M	5
56	3401	5	9		7M	7	5	9		5M	5
57	3312R	6	8		8	8	7	9		7	7
58	3312R	6	8		8	8	7	9		7	7
59	3313	6	8		7	7	6	9		6	6
60	3313	6	8		7	7	6	9		6	6
61	3314	6	8		8	8	6	9		7	7

0007-SWP-046062

Panel No.	OJ No.	SOUTH				Gen. App.	NORTH				Gen. App.
		Chalk	Eros'n	Fade	Dirt		Chalk	Eros'n	Fade	Dirt	
16062	3314	5	8		8	8	5	9		7	7
Colonial Yellow											
16063	3400Y	6	10	3	6	4	5	10	3	5	4
64	3400Y	6	10	3	6	4	5	10	3	5	4
65	3400Y	6	10	3	6	4	5	10	3	5	4
66	3402Y	6	10	5	6	5	Y7	10	5	4	4
67	3402Y	6	10	5	6	5	Y7	10	5	4	4
68	3317Y	7Y	10	6	5	5	8Y	10	7	3	5
69	3317Y	7Y	10	5	5	5	8Y	10	7	3	5
70	3403Y	6Y	10	5	6	5	Y7	10	5	4	4
71	3403Y	6Y	10	5	6	5	7Y	10	5	4	4
72	3400G	6	10	3	6	4	6	10	4	5	4
73	3400G	6	10	3	6	4	6	10	4	5	4
74	3400G	5	10	3	6	4	6	10	4	5	4
75	3402G	6	10	4	4	4	7	10	5	4	4
76	3402G	5	10	4	4	4	7	10	5	4	4
77	3317G	7	10	5	5	5	9	10	7	3	5
78	3317G	6	10	5	5	5	9	10	7	3	5
79	3403G	6	10	4	4	3	8	10	5	3	3
80	3403G	6	10	4	4	3	8	10	5	3	3
du Pont Samples											
16081	3401	6	9		6M	6	6	10		5M	5
81A	3401	6	9		8M	6	6	10		5M	5
82	#1	6	8		8	8	6	9		6	6
83	#1	6	8		8	8	5	9		7	7

0007-SWP-046063

Panel No.	RB No.	SOUTH				Gen. App.	NORTH				Gen. App.
		Chalk	Eros'n	Fade	Dirt		Chalk	Eros'n	Fade	Dirt	
16084	#1	6	8		8	8	6	9		6	6
85	#1	5	8		8	8	6	9		7	7
86	1A	5	8		8	8	6	9		7	7
87	1A	5	8		8	8	5	9		7	7
88	2	8	10		7	7	8	10		5	5
89	2	8	10		7	7	8	10		6	6
90	3	5	8		8	8	5	9		7	7
91	3	5	8		8	8	4	9		7	7
92	3A	4	8		8	8	5	9		7	7
93	3A	4	8		8	8	4	9		7	7
94	4	4	8		8	8	5	9		7	7
95	4	4	8		8	8	5	9		7	7
96	4A	4	8		8	8	6	9		7	7
97	4A	4	8		8	8	5	9		7	7
98	5	6	8		8	8	6	9		7	7
99	5	6	8		8	8	6	9		7	7
16100	5	6	8		8	8	7	9		7	7
01	5	6	8		8	8	7	9		7	7
Colonial Yellow Shade											
16102	3400Y	5	10	3	6	4	6	10	3	5	4
03	206	8Y	10	7	5	6	8Y	10	8	3	6
04	206	8Y	10	7	5	6	8Y	10	8	3	6

0007-SWP-046064

Panel No.	RB No.	Chalk	SOUTH Eros'n	Fade	Dirt	Gen. App.	Chalk	NORTH Eros'n	Fade	Dirt	Gen. App.
16105	206A	7Y	10	7	5	6	8	10	8	3	6
06	206A	7Y	10	7	5	6	8	10	8	3	6
07	207	8Y	10	6	5	5	8	10	7	4	6
08	207	8Y	10	6	5	5	8	10	7	4	6
Chelsea Gray Shade											
16109	3400G	5	10	3	6	4	6	10	4	5	4
10	106	7	10	6	4	5	8	10	8	3	6
11	106	7	10	6	4	5	8	10	8	3	6
12	106A	7	10	7	4	5	9	10	8	3	6
13	106A	7	10	6	4	5	9	10	8	3	6
14	107	8	10	7	5	6	8	10	8	3	6
15	107	8	10	6	5	6	0	8	8	3	6

Gloss is "0" on all.
There is no checking or cracking.

0007-SWP-046065

0007-SWP-000115438

Supplementary Series

Examination at 6 Months, Florida

Panel No.	Description	RB No.	Gloss	Chalk	Check	Crack	Dirt*	Mildew Guide	Test	Gen. App.
Guide	Reg. Rex 450-471									
18502	Left 1/3	3401RR	2	6-7	10	10	6	--	--	4-6
03	Same, center 1/3	3401RR	2	7	10	10	6	7	7	6
04	Rt. 1/3. Same, but self-primed	3401RR	2	7	10	10	6	7	6	5
05	Center (over Rex 450) using 50/50 FF/YCR	3312	3	9	10	10	4	6	3	3
06	Same, self-primed	3312	2	9	10	10	4	6	3	3
07	82/18 FF/R610	3313	3	8	10	10	4	6	3	3
08	Same, self-primed	3313	2	8	10	10	4	6	3	3
09	50/50 FF/R27	3314	2	8	10	10	6	7	6	5
10	Same, self-primed	3314	1	8	10	10	6	7	5	4
du Pont Paints										
11	FF/co-fumed Pb-Zn/Mg sil.	#1	2	7	10	10	6	7	7	6
12	Self-primed	#1	1	7	10	10	6	7	6	5
13	CaCO ₃ for Mg sil.	2	1	6	10	10	6	4	6	5
14	Self-primed	2	1	6	10	10	6	4	6	5
15	FF/YCR/co-fumed Pb-Zn/Mg sil.	3	4	9	10	10	5	4	5	4
16	Self-primed	3	4	9	10	10	5	4	4	3
17	Acic. ZnO for co-fumed	4	3	8	10	10	5	4	6	5
18	Self-primed	4	3	8	10	10	5	4	4	3
19	FF/Mg sil. No lead, no zinc	5	1	6	10	10	6	4	6	5
20	Self-primed	5	1	6	10	10	6	4	6	5
Primer Variations										
21	Guide. As 18502 but zincless primer TTP	RB 3401	2	7	10	10	6	--	--	4-6

0007-SWP-046066

Panel No.	Description	RB No.	Gloss	Chalk	Check	Crack	Dirt*	Mildew Guide	Test	Gen. App.
18522	#1 paint with TTP Primer	#1	2	7	10	10	6	5	5	4
23	Self-primed		2	7	10	10	6	5	4	3
24	#5 paint with TTP Primer	#5	1	6	10	10	7	5	5	4
25	Self-primed		1	6	10	10	7	5	6	5

*Mildew is the real offender. "Dirt" is only rated roughly, to give an idea of the grayness due to slow clean-up.

Examination at 6 Months, Chicago

Panel No.	RB No.	SOUTH			Gen. App.	NORTH			Gen. App.
		Gloss	Chalk	Dirt		Gloss	Chalk	Dirt	
18502	3401RR	2	6	5	5	3	8	6	6
				(part dust)					
03	3401RR	2	6	5	5	3	8	6	6
				(microscope used)					
04	3401RR	2	6	5	5	3	8	6	6
05	3312	3	7	4	4	4	8	5	5
06	3312	3	7	5	5	4	8	6	6
07	3313	3	7	4	4	4	8	5	5
08	3313	3	7	4	4	4	8	6	6
09	3314	3	8	4	4	4	8	5	5
10	3314	3	8	4	4	4	8	6	6
11	#1	2	6	4	4	4	8	6	6
12	#1	2	6	4	4	4	8	7	7
13	#2	3	8	5	5	4	9	6	6
14	#2	3	8	5	5	4	9	7	7

Dirt more "normal" on N, not as much dust.

0007-SWP-046067

Panel No.	RB No.	SOUTH			Gen. App.	NORTH			Gen. App.
		Gloss	Chalk	Dirt		Gloss	Chalk	Dirt	
18515	#3	2	6	4	4	4	8	6	6
16	#3	2	6	4	4	4	8	7	7
17	#4	2	7	5	5	4	9	6	6
18	#4	2	7	5	5	4	9	7	7
19	#5	2	6	5	5	3	8	6	6
20	#5	2	6	5	5	3	7	7	7
21	3401	2	6	4	4	3	8	6	6
22	#1	2	5	4	4	3	7	6	6
23	#1	2	5	4	4	3	7	7	7
24	#5	3	7	5	5	4	8	7	7
25	#5	3	7	5	5	4	8	7	7

0007-SWP-046068

0007-SWP-000115441

Formulas Involved

SWP Undercoater - RB 3322

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100		2077
250		20
240		511
120		18
142		2174
3		547
	3/4	(5094)
	28	(2)
	14-1/2	(310)
	4	(141)
	1-1/2	(901)
	1-1/2	(543)
	25	(348)

Wt./Gal. - T 13.73 - A 13.76
Viscosity 14" @ 75 deg. on #3

SWP Fume Resisting White - RB 3307R

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100		1403 Ti-Pure FF Lot 5748
100		Ti-Pure YCR Lot 92245
290		2059
288		20
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T 13.29 - A 13.33
Viscosity 25" @ 75 deg. on #3

Fume Resisting White - RB 3308R

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
200		Ti-Pure YCR Lot 92245
290		2059
288		20
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T 13.29 - A 13.33
Viscosity 33" @ 75 deg. on #3

SWP Fume Resisting White - RB 3309

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
126		1403 Ti-Pure FF
42		2174 Ti-Pure R-610
314		20
290		2059
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T 13.22 - A 13.27
Viscosity 29" @ 75 deg. on #3

0007-SWP-046069

0007-SWP-000115442

Fume Resisting White - RB 3310

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
74	1403	Ti-Pure FF
246	2132	Ti-Cal R-27
75		1989
112		20
290		2059
	32-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	14-1/4	(348)

Wt./Gal. - T 13.48 - A 13.44
Viscosity 28" @ 75 deg. on #3

SWP Gloss White - RB 3401

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
170	1403	- Ti-Pure FF
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.22
Viscosity 30" @ 75 deg. on #3

SWP Gloss White - RB 3312R

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
85	1403	Ti-Pure FF lot 5748
85	2030	Ti-Pure YCR lot 92245
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.29
Viscosity 25" @ 75 deg. on #3

SWP Gloss White - RB 3313

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
30	2174	Ti-Pure R-610
140	1403	Ti-Pure FF
200		412
200		1424
325		20
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	16-3/4	(348)

Wt./Gal. - T 14.25 - A 14.24
Viscosity 29" @ 75 deg. on #3

0007-SWP-046070

0007-SWP-000115443

SWP Gloss White - RB 3314

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
250		20
175	2132	- TI-Cal R-27
100	1403	- TI-Pure FF
200		412
200		1424
	32-1/2	(2)
	19	(310)
	1-3/4	(901)
	5/8	(543)
	4	(141)
	15-3/4	(348)

Wt./Gal. - T 14.46 - A 14.53
Viscosity 28" @ 75 deg. on #3

SWP Tint Base - RB 3400

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
137		2174
325		20
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	17	(5027)

Wt./Gal. - T 14.38 - A 14.37
Viscosity 19" @ 75 deg. on #3

Tint Base - RB 3402

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
325		TI-Cal R-60 - new sample
		from Pig. Division
200		20
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	13	(5027)

Wt./Gal. - T 15.00 - A 15.06
Viscosity 30" @ 75 deg. on #3

0007-SWP-046071

0007-SWP-000115444

Tint Base - RB 3317

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
137		2174
375		566
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	14	(5027)

Wt./Gal. - T 14.65 - A 14.66
Viscosity 17" @ 75 deg. on #3

Tint Base - RB 3403

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
440		412
325		Ti-Cal R-60*
230		566
	1/2	(5094)
	32-1/2	(2)
	19	(310)
	1-1/4	(901)
	3/4	(543)
	4	(141)
	11	(5027)

Wt./Gal. - T 15.10 - A 15.08
Viscosity 30" @ 75 deg. on #3
*New approved sample - lot 2469

S-11053, Paint #1

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
127	3.92	Ti-Pure FF
424	8.65	Co-fumed 35% Leadad ZnO
297	12.50	Magnesium Silicate
318	40.90	Alkali Refined Linseed Oil
107	13.38	"X" Bodied Linseed Oil
12.2	1.25	24% Lead Naphthenate
1.6	0.20	6% Mn Naphthenate
126	19.20	Mineral Spirits
<u>1412.8</u>	<u>100.00</u>	
4.2	0.48	Soya Lecithin
2.2	0.27	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.13
Consistency - 83 K.U.
PVC - 31.6%

0007-SWP-046072

0007-SWP-000115445

S-11053 - Paint #1A

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
127	3.92	Ti-Pure FF
424	8.65	Co-Fumed 35% Leaded ZnO
297	12.50	Magnesium Silicate
344	44.24	Alkali Refined Linseed Oil
81	10.04	S-W Bodied Linseed Oil
12.2	1.25	24% Lead Naphthenate
1.6	0.20	6% Mn Naphthenate
126	19.20	Mineral Spirits
<u>1412.8</u>	<u>100.00</u>	
4.2	0.48	Soya Lecithin
1.4	0.17	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.13
 Consistency - 83 K.U.
 PVC - 31.6%

S-11053, Paint #2

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
150	4.64	Ti-Pure FF
255	5.20	Co-Fumed 35% Leaded ZnO
599	26.66	Natural Ground Whiting
269	34.66	Alkali Refined Linseed Oil
91	11.34	"X" Bodied Linseed Oil
10.3	1.06	24% Lead Naphthenate
1.4	0.17	6% Mn Naphthenate
107	16.27	Mineral Spirits
<u>1482.7</u>	<u>100.00</u>	
5.0	0.57	Soya Lecithin
1.8	0.22	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.83
 Consistency - 82 K.U.
 PVC - 44.2%

0007-SWP-046073

0007-SWP-000115446

S-11053 - Paint #3

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
90	2.78	Ti-Pure FF
90	2.78	Ti-Pure YCR
424	8.65	Co-Fumed 35% Leadcd ZnO
258	10.86	Magnesium Silicate
318	40.90	Alkali Refined Linseed Oil
107	13.38	"x" Bodied Linseed Oil
12.2	1.25	24% Lead Naphthenate
1.6	0.20	6% Mn Naphthenate
126	19.20	Mineral Spirits
<u>1426.8</u>	<u>100.00</u>	
4.3	0.49	Soya Lecithin
1.8	0.22	Spencer Kellogg Special M-25 L.O.
Wt./Gal. - 14.27		
Consistency - 83 K.U.		
PVC - 31.6%		

S-11053 - Paint #3A

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
90	2.78	Ti-Pure FF
90	2.78	Ti-Pure YCR
424	8.65	Co-Fumed 35% Leadcd ZnO
258	10.86	Magnesium Silicate
344	44.24	Alkali Refined Linseed Oil
81	10.04	SW Bodied Linseed Oil
12.2	1.25	24% Lead Naphthenate
1.6	0.20	6% Mn Naphthenate
126	19.20	Mineral Spirits
<u>1426.8</u>	<u>100.00</u>	
4.3	0.49	Soya Lecithin
1.4	0.17	Spencer Kellogg Special M-25 L.O.
Wt./Gal. - 14.27		
Consistency - 83 K.U.		
PVC - 31.6%		

0007-SWP-046074

0007-SWP-000115447

S-11053 - Paint #4

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
96	2.97	Ti-Pure FF
96	2.97	Ti-Pure YCR
276	5.91	Acicular ZnO
215	9.05	Magnesium Silicate
335	43.22	Alkali Refined Linseed Oil
113	14.13	"X" Bodied Linseed Oil
12.7	1.31	24% Lead Naphthenate
1.7	0.24	6% Mn Naphthenate
133	20.20	Mineral Spirits
<u>1278.4</u>	<u>100.00</u>	
3.4	0.39	Soya Lecithin
2.1	0.26	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 12.78
 Consistency - 83 K.U.
 PVC - 26.8%

S-11053 - Paint #4A

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
96	2.97	Ti-Pure FF
96	2.97	Ti-Pure YCR
276	5.91	Acicular ZnO
215	9.05	Magnesium Silicate
363	46.70	Alkali Refined Linseed Oil
85	10.64	S-W Bodied Linseed Oil
12.7	1.32	24% Lead Naphthenate
1.7	0.24	6% Mn Naphthenate
133	20.20	Mineral Spirits
<u>1278.4</u>	<u>100.00</u>	
3.4	0.39	Soya Lecithin
2.7	0.33	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 12.78
 Consistency - 83 K.U.
 PVC - 26.8%

0007-SWP-046075

0007-SWP-000115448

S-11053 - Paint #5

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
200	6.18	Ti-Pure FF
370	15.60	Magnesium Silicate
424	50.78	Aroplaz 1271
10.6	1.09	24% Lead Naphthenate
2.1	0.26	6% Cobalt Naphthenate
148	22.57	Mineral Spirits
24	3.52	10% Solution Phenyl Mercury Oleate
<u>1178.7</u>	<u>100.00</u>	

Wt./Gal. - 11.79
 Consistency - 84 K.U.
 PVC - 30%

S-11053 - White Base Paint for #106 and #200

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
120	3.43	Ti-Pure R-610
254	5.44	Acicular ZnO
551	24.52	Natural Ground Whiting
283	36.47	Raw Linseed Oil
94	11.75	"X" Bodied Linseed Oil
10.8	1.11	24% Lead Naphthenate
1.4	0.17	6% Mn Naphthenate
112	17.11	Mineral Spirits
<u>1426.2</u>	<u>100.00</u>	
4.6	0.53	Soya Lecithin
3.5	0.43	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.26
 Consistency - 83 K.U.
 PVC 80%

0007-SWP-046076

0007-SWP-000115449

8-11053 - White Base Paint for #106A and #206A

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
120	3.43	Ti-Pure R-610
254	5.44	Acicular ZnO
551	24.52	Natural Ground Whiting
305	39.30	Raw Linseed Oil
72	8.92	S-W Bodied Linseed Oil
10.8	1.11	24% Lead Naphthenate
1.4	0.17	6% Mn Naphthenate
112	17.11	Mineral Spirits
<u>1426.2</u>	<u>100.00</u>	
4.6	0.53	Soya Lecithin
3.9	0.48	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.26
 Consistency - 82 K.U.
 PVC - 40.8%

8-11053 - White Base for #107 and #207

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
142	4.06	Ti-Pure R-610
100	2.24	Acicular ZnO
736	32.75	Natural Ground Whiting
259	33.33	Raw Linseed Oil
87	10.90	"X" Bodied Linseed Oil
9.9	1.02	24% Lead Naphthenate
1.3	0.16	6% Mn Naphthenate
103	15.64	Mineral Spirits
<u>1438.2</u>	<u>100.00</u>	
4.9	0.56	Soya Lecithin
1.9	0.24	Spencer Kellogg Special M-25 L.O.

Wt./Gal. - 14.38
 Consistency - 83 K.U.
 PVC - 46.8%

0007-SWP-046077

0007-SWP-000115450

TT-P-25a Type Primer

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
122	3.49	Ti-Pure R-610
230	4.07	BOM
230	4.33	BOM
338	14.21	Magnesium Silicate
170	21.90	Raw Linseed Oil
206	25.60	Z-2 Bodied Linseed Oil
9.9	1.02	24% Lead Naphthenate
1.3	0.16	6% Mn Naphthenate
165	25.22	Mineral Spirits
<u>1472.2</u>	<u>100.00</u>	

3 0.40 RL-80 Bodying Agent

Wt./Gal. - 14.72
Consistency - 87 K.U.
PVC - 35.46%

Amount of Tinting Agents Added to the
White Bases for the Grays and Buffs

<u>Paint No.</u>	<u>Amount added to 100 gallon of white base</u>	
	<u>Pounds of Sienna Paste</u>	<u>Pounds of Black Paste</u>
106	9.1	4.7
Grays 106A	10	5
107	8.5	4
206	69.6	Less than 1
Yellows 206A	78.3	"
207	73.9	"

Tinting Pastes Used

du Pont Sienna

Pigment	64%	Raw Italian Sienna	60	100%
Vehicle	36%	Silicates	40	
		Linseed Oil		100%

du Pont Lampblack

Pigment	26%	Pigment 100%	Carbon
Vehicle	74%	Vehicle 100%	Linseed Oil

JWC:ls

John W. Chapin

0007-SWP-046078

Paint Research Department - March 29, 1954

Second Progress Report on Exposures 15934-58 C.F.

St. Joseph Lead Company Cooperative Series

Previous Report - September 30, 1952

Purpose

To compare a number of white house paints using various zinc oxides in both lead-free and lead-containing formulations. The series included Rex 471, Borden's White and Green containing type and both Rex 450 and Form Resistant and St. Joseph's submitted samples as lead-free types. The zinc oxides involved are:

American Zinc's Azo ZZZ-33 and ZZZ-55
New Jersey's Horsehead XX-592, -503 and -50
St. Joseph's Green Label #17, 40 and 42

Preparation and Exposure

The two companies exchanged the paints described above and each painted out a complete series for exposure. Our series is on cedar bevel siding, primed with Rex 450 Undercoater and also as self-primed (both on one panel). The tests have been exposed 24 months at Florida, vertical south. Panels were also exposed at Coffeyville, Kansas, and at Chicago, both vertical south. Because of an unfortunate error in the handling of panels at Coffeyville we were not able to get them for examination at 24 months; therefore, we have advanced the ratings of both the Chicago and Coffeyville panels to 30 months.

Summary of Results

The previous report at one year (excluding Coffeyville tests) mentioned some slight variations in chalking, dirt collection and microscopic checking, but nothing which would establish a definite trend with regard to any particular zinc oxide.

In some respects the ratings at 2 to 2-1/2 years show considerably more significant results. Some of the checking results at Coffeyville seem interesting. In general, the correlation among the three types of paints in this respect is not very good. XX-592 shows the most advanced failure and is the only oxide showing serious checking in all three types.

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0007-SWP-000115452

J.C. Weaver
MAY 3 1954

Others showing indications of trouble with checking are, in decreasing order of incidence, XX-50, XX-503, ZZZ-55 and St. Joseph #17. ZZZ-33 seems best, entirely free of checking, while St. Joseph #40 and #42 show nothing serious. There is no clear choice among the three types of formulas in this respect. The Chicago panels do not show any failure except erosion, and this is not advanced enough to be conclusive. XX-50 and XX-592 seem a little more chalky and possibly more eroded than the others.

Part of the series at Florida showed serious mildew growth. Although the differences were not outstanding, there seemed to be a definite trend toward more mildew and dirt on the St. Joseph leadless paints than on the Rex 471 type. Since part of the series, apparently because of location on the fences, showed very little mildew and dirt, there is no opportunity to compare Rex 436 along the same line. All Coffeyville panels showed excellent clean-up. Furthermore, all Chicago panels are satisfactorily clean, with the slight differences favoring the XX-50 and XX-592 in clean-up but no other zinc oxides. All of the three paint types seem about alike in clean-up.

Examination at 24 Months, Florida

Panel No.	Description	RB No.	Chalk	Check	Crack	Eros'n	Dirt		Gen. App.
							Guide	Test	
Guide	Reg. Rex 450-471								
15934F	Rex 436 Fume Resistant O.W.	3208	6	10	10	8			6-7
35A	with ZZZ-33 over Rex 450	3200	5	10	10	7	7	8	8
B	Self-Primed	3200	4	10	10	7	7	8	8
36A	With XX-503	3201	5	10	10	7	7	8	8
B	Self-primed	3201	5	10	10	7	7	8	8
37A	With XX-50	3202	5	10	10	7	7	8	8
B	Self-primed	3202	4	10	10	7	7	8	8
38A	With XX-592	3203	4	10	10	7	7	8	8
B	Self-primed	3203	4	10	10	7	7	8	8
39A	St. Joe #17	3204	4	10	10	6		8	7 thin
B	Self-primed	3204	4	10	10	6		8	7 thin
40A	St. Joe #40	3205	5	10	10	7		8	8
B	Self-primed	3205	5	10	10	7	7	8	8

0007-SWP-046080

Panel No.	Description	RB No.	Chalk	Check	Crack	Eros'n	Dirt		Gen. App.
							Guide	Test	
15941A	St. Joe #42	3206	5	10	10	7	7	8	8
B	Self-primed	3206	5	10	10	8	7	8	8
42A	ZZZ-55	3207	5	10	10	8	7	8	8
B	Self-primed	3207	5	10	10	7	7	8	8
Box 471 15943A	SWP Gloss White As guide, using co- fumed	3208	6	10	10	8	7	8	8
B	Self-primed	3208	6	10	10	8	7	8	8
44A	Mechanical mix, with ZZZ-33	3209	6	10	10	8	7	8	8
B	Self-primed	3209	6	10	10	8	7	8	8
45A	With XX-503	3210	5	8m	10	8	7	8	8
B	Self-primed	3210	5	8m	10	8	7	8	8
46A	With XX-50	3211	5	10	10	6	7	8	8
B	Self-primed	3211	4	10	10	6	7	8	8
47A	With XX-592	3212	5	9m	10	6	4M	4M	4
B	Self-primed	3212	5	9m	10	6	4M	5M	5
48A	St. Joe #17	3213	5	8m	10	6	5M	6M	6
B	Self-primed	3213	5	8m	10	6	5M	6M	6
49A	St. Joe #40	3214	6	8m	10	7	5M	6M	6
B	Self-primed	3214	6	8m	10	7	5M	6M	6
50A	St. Joe #42	3215	6	6m	10	6	5M	7	7
B	Self-primed	3215	6	5m	10	6	5M	7	7
51A	ZZZ-55	3216	6	7m	10	6	6M	6	6
B	Self-primed	3216	6	6m	10	6	6M	6	6

M = Mildew. This is the exception, not the rule.

0007-SWP-046081

Panel No.	Description	RB No.	Chalk	Check	Crack	Erosion	Galvanic	Stain	Other
St. Joseph Paints (lead-free)									
159A	Using ZZZ-33		5	10	10	8	6	5M	5
B	Self-primed		4	10	10	7	6	5M	5
53A	XX-503		6	10	10	8	6	6	6
B	Self-primed		5	10	10	7	6	6	6
54A	XX-50		5	9m	10	7	7	5M	5
B	Self-primed		4	9m	10	7	7	5M	5
55A	XX-592		5	9m	10	7	7	6M	6
B	Self-primed		4	8m	10	7	7	6M	6
56A	St. Joe #17		5	10	10	7	7	6M	6
B	Self-primed		5	10	10	7	7	6M	6
57A	St. Joe #40		5	10	10	8	7	6M	5
B	Self-primed		5	10	10	8	7	6M	5
58A	St. Joe #42		5	10	10	7	7	6	6
B	Self-primed		4	10	10	7	7	6	6

M = Mildew. This is the exception, not the rule.

0007-SWP-046082

0007-SWP-000115455

Examination at 30 Months, Coffeyville

Panel No.	RB No.	Chalk	Check	Crack	Dirt	Gen. App.
15934	3208	7	10	10	7	7
35A	3200	7	10	10	8	8
B	3200	7	10	10	8	8
36A	3201	7	10	10	7	7
B	3201	7	10	10	7	7
37A	3202	6	10	10	8	8
B	3202	6	10	10	8	8
38A	3203	5	6m	10	8	8
B	3203	5	4m	10	8	8
39A	3204	7	8m	10	7	7
B	3204	6	7m	10	7	7
40A	3205	7	10	10	8	8
B	3205	6	10	10	8	8
41A	3206	7	9m	10	8	8
B	3206	7	8m	10	8	8
42A	3207	7	6m	10	7	7
B	3207	5	4m	10	7	7
Rex 471 SWP Gloss White						
15943A	3208	7	10	10	7	7
B	3208	7	10	10	7	7
44A	3209	6	8m	10	7	7
B	3209	6	7m	10	7	7
45A	3210	6	5m	8m	7	7
B	3210	6	4m	8m	7	7

0007-SWP-046083

Panel No.	RB No.	Chalk	Check	Crack	Dirt	Gen. App.
15946A	3211	5	6m	10	8	8
B	3211	5	4m	10	8	8
47A	3212	5	2m	5m*	7	7
B	3212	5	2m	5m*	7	7
48A	3213	7	9m	10	7	7
B	3213	6	9m	10	7	7
49A	3214	6	8m	10	7	7
B	3214	6	7m	10	7	7
50A	3215	6	9m	10	7	7
B	3215	6	9m	10	7	7
51A	3216	5	9m	10	8	8
B	3216	5	9m	10	8	8
St. Joseph Paints (lead-free)						
15952A		7	10	10	8	8
B		7	8m	10	8	8
53A		7	7m	10	8	8
B		7	7m	10	8	8
54A		6	5m	9m	8	8
B		6	5m	9m	8	8
55A		5	2	5	8	8
B		5	part m 0	part m 3	8	8
56A		7	part m 5m	part m 10	8	8
B		6	4m	10	8	8
57A		7	8m	10	8	8
B		6	6m	10	8	8
58A		7	10	10	8	8
B		6	10	10	8	8 0007-SWP-046084

*Guide also checking and cracking about same. Although not warped,
this panel must be discounted.

Examination at 31 Months, Chicago

Panel No.	RB No.	Chalk	Check	Crack	# Cross'n	Dirt	Gen. App.
15934C	3206	6	10	10	8	7	7
35A	3200	6	10	10	7	8	8
B	3200	6	10	10	7	8	8
36A	3201	7	10	10	7	7	7
B	3201	7	10	10	7	7	7
37A	3202	7	10	10	6	8	8
B	3202	6	10	10	6	8	8
38A	3203	6	10	10	6	8	8
B	3203	5	10	10	6	8	8
39A	3204	8	10	10	7	7	7
B	3204	8	10	10	7	7	7
40A	3205	8	10	10	8	7	7
B	3205	8	10	10	8	7	7
41A	3206	8	10	10	8	7	7
B	3206	7	10	10	8	7	7
42A	3207	8	10	10	7	8	8
B	3207	7	10	10	7	8	8
43A	3208	7	10	10	8	7	7
B	3208	7	10	10	8	7	7
44A	3209	7	10	10	7	8	8
B	3209	7	10	10	7	8	8
45A	3210	7	10	10	7	8	8
B	3210	7	10	10	7	8	8
46A	3211	7	10	10	6	8	8
B	3211	6	10	10	6	8	8

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Panel No.	RB No.	Chalk	Check	Crack	Eros'n	Dirt	Gen'l App.
15947A	3212	6	10	10	7	7	7
B	3212	6	10	10	7	7	7
48A	3213	7	10	10	8	7	7
B	3213	6	10	10	7	7	7
49A	3214	7	10	10	7	7	7
B	3214	7	10	10	6	7	7
50A	3215	7	10	10	7	8	8
B	3215	6	10	10	7	8	8
51A	3216	7	10	10	7	7	7
B	3216	7	10	10	7	7	7
St. Joe Paints (lead-free)							
15952A		7	10	10	7	8	8
B		7	10	10	7	8	8
53A		7	10	10	7	8	8
B		7	10	10	6	8	8
54A		7	10	10	7	8	8
B		6	10	10	6	8	8
55A		7	10	10	7	7	7
B		-7	10	10	7	7	7
56A		8	10	10	8	8	8
B		7	10	10	7	8	8
57A		8	10	10	8	8	8
B		7	10	10	7	8	8
58A		8	10	10	7	8	8
B		7	10	10	7	8	8

JWC:ls

0007-SWP-046086

Formulas Involved

SWP Fume Resisting White - RB 3200

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100		1403
160		2030
290		Azo 33
288		20
	28-1/2	(2)
	19	(310)
	3	(5096)
	1-1/2	(543)
	2	(2231)
	1-1/4	(2236)
	4	(141)
	18-1/4	(348)

Wt./Gal. - T 13.29 - A 13.38
Viscosity 46" @ 75 deg. on #3

SWP Fume Resisting White - RB 3202

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

New Jersey XX-50

Wt./Gal. - T 13.29 - A 13.33
Viscosity 42" @ 75 deg. on #3

SWP Fume Resisting White - RB 3201

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

New Jersey XX 503

Wt./Gal. - T 13.29 - A 13.26
Viscosity 35" @ 75 deg. on #3

SWP Fume Resisting White - RB 3203

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

New Jersey XX-592

Wt./Gal. - T 13.29 - A 13.31
Viscosity 32" @ 75 deg. on #3

SWP Fume Resisting White - RB 3204

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

St. Joe #17

Wt./Gal. - T 13.29 - A 13.33
Viscosity 35" @ 75 deg. on #3

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SWP Fume Resisting White - RB 3205

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

St. Joe #40

Wt./Gal. - T 13.29 - A 13.30
Viscosity 55" @ 75 deg. on #3

SWP Fume Resisting White - RB 3206

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

St. Joe #42

Wt./Gal. - A 13.36
Viscosity 55" @ 1/8 cup

SWP Fume Resisting White - RB 3207

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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Same as RB 3200 except using

Azo 55

Wt./Gal. - T 13.29 - A 13.30
Viscosity 50" @ 75 deg. on #3

SWP Gloss White - RB 3208

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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275		20
75		2132
150		1403
200		412
200		1424

32-1/2	(2)
19	(310)

1-3/4	(901)
5/8	(543)
4	(141)
16-3/4	(348)

Wt./Gal. - A 14.23
Viscosity 25" @ 75 deg. on #3

SWP Gloss White - RB 3209

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
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275		20
75		2132
150		1403
306		Azo 33
94		18

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.30
Viscosity 44" @ 75 deg. on #3

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0007-SWP-000115461

SWP Gloss White - RB 3210

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
150		1403
306	New Jersey XX-503	
94		18

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.3
viscosity 31" @ 75 deg. on #3

SWP Gloss White - RB 3211

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
150		1403
306	New Jersey XX-50	
94		18

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.20
Viscosity 29.2" @ 75 deg. on #3

SWP Gloss White - RB 3213

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
306	New Jersey XX-592	
94		18
150		1403

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.29
Viscosity 36.5" @ 75 deg. on #3

SWP Gloss White - RB 3213

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
306	St. Joe #17	
94		18
150		1403

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.31
Viscosity 34" @ 75 deg. on #3

SWP Gloss White - RB 3214

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
306	St. Joe #40	
94		18
150		1403

Vehicle same as RB 3208

Wt./Gal. - T 14.29 - A 14.28
Viscosity 54" @ 75 deg. on #3

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0007-SWP-000115462

SWP Gloss White - RB 3215

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
306		St. Joe #42
94		18
150		1403

Vehicle same as RB 3208

Wt./Gal. - A 14.27

Viscosity 52" @ 75 deg. on #3

SWP Gloss White - RB 3216

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
275		20
75		2132
306		Azo ZZZ-55
94		18
150		1403

Vehicle same as RB 3208

Wt./Gal. - A 14.33

Viscosity 51" @ 75 deg. on #3

SWP Undercoater - RB 3271

<u>Pounds</u>	<u>Gallons</u>	<u>Material</u>
100		2077
250		20
240		511
120		18
142		2174
3		547
	3/4	(5094)
	28	(2)
	14-1/2	(310)
	4	(141)
	1-1/2	(901)
	1-1/2	(543)
	25	(348)

Wt./Gal. - T 13.73 - A 13.60

Viscosity 14.8" @ 75 deg. on #3

We have no formulas or description of the paints submitted by St. Joseph, other than a statement of the zinc oxide used in each, which is typed with the Florida readings (above).

JWC:ls

0007-SWP-046090

0007-SWP-000115463

Paint Research Department - December 28, 1954

Progress Report on Exposures 16846-51 F,C

Fast-Dry Paint Systems for Redwood

Previous Report

June, 1953 Monthly Report, Page 22. (No separate report).

Purpose

These tests were suggested by Dr. H. J. Asbeck in his letter of December 7, 1951 to Mr. H. S. Sherman. Briefly, these are rather unorthodox finishing systems suggested for use by Alsidex, Inc., at a time when it was thought that they might have to merchandise pre-painted reduced siding as a substitute for aluminum.

Paints Tested

- (A) AA-215J sealer, a low solids varnish based on (4367) linseed-tung-phendic.
- (B) H51 V A15 primer, a synthetic air-drying formula which Alsidex favored for aluminum because of its fast drying.
- (C) H56 V A2 semi-gloss synthetic finish coat.
- (D) V91 V G1, an alkyd aluminum primer of a type suggested by Alcoa, based on our (3879).

Preparation and Exposure

The exposures are all on redwood bevel siding and compare the sealer-primer-enamel system against primer-enamel only and against sealer-aluminum-enamel. All have been exposed 2 years at Florida, vertical south, and 28 months at Chicago, north and south.

Summary of Results

At one year, the results were surprisingly good, no appreciable film failure at either location. However, both sets show some weaknesses at 2 years. The Florida panels show a microscopic checking which looks like small line cracks but definitely does not extend below the top coat. This is not serious in extent except on two samples, one the 3-coat system with the top two coats air-dried rather than baked, and the 2-coat system

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(no sealer) of the same. It might be worthy of note that aluminum primer without sealer shows very little of this checking; in other words, the baked E61 W A10 - E66 W A2 system and the V91 V C3 - E66 W A2 system, even without a sealer coat, look better than the synthetic system air-dried. All show considerable dirt, part of which is mildew.

The Chicago exposures do not follow the same pattern. The appearance is even less satisfactory than at Florida, on account of dirt and mildew. Checking of the surface coat only is not encountered on these panels; in fact, there is essentially no failure except on the systems having no sealer. These show deep cracks, partly microscopic, and even some flaking, with the air-dry sample much worse than the baked. The aluminum-primed systems and the baked synthetic with sealer seem very durable so far.

JWC:ls

John W. Chapin

ARM EWF HFC RAN

0007-SWP-046092

0007-SWP-000115465

Paint Research Department - December 28, 1954

Final Report on Exposures 16310-21 H

Fungicidal Effect of Whiting in Rx 472

Purpose

To check some results reported by du Pont which indicated that whiting was effective in resisting mildew growth.

Paints Tested

A series of paints was prepared using 6301 dry whiting, with zinc oxide content varying from 30.4% down to 8.0%. One half of the series used the regular 3% of tetrachlorophenol, the other half no agent. There are also samples using 6221 dry magnesium silicate with 30.4% zinc oxide with the agent and without it.

Preparation and Exposure

All tests are on 8 x 24" Ponderosa pine, 2 coats self-primed. Havana, Cuba, was the only location for this series. The time of exposure was 21 months.

Summary of Results

Due to the shaded location in use at Havana at this time, there was no chalking and very little film failure. The only checking was microscopic and quite obviously due to the presence of tetrachlorophenol. One pair of panels indicates a very serious checking tendency with whiting at a high zinc oxide level compared with none for the 6221 dry sample. However, we would be inclined to discredit a single case of this kind at the Havana location (also because of the wood and the absence of a control).

The picture with regard to mildew follows a logical pattern and seems to indicate a significant trend. In the group carrying no fungicide, the mildew growth is extremely bad, but just noticeably less with the highest zinc oxide samples, both the 6301 dry and whiting samples. In the treated group, the mildew growth runs from moderate to heavy, but much less than in the other group. The lowest zinc oxides and the 30.4% sample with 6221 dry show the most mildew, while the highest zinc oxides with whiting show the least. We cannot trust this one series to prove the effectiveness of whiting, but it seems indicated to some extent.

JWC:ls

John W. Chapin

ABH EMF SFC

0007-SWP-046093

0007-SWP-000115466

Paint Research Department - December 29, 1954

Progress Report on Exposures 18913-6 F,C

Loaded Zinc Versus Rutile Titanium in SWP Ardmore Green

Purpose

To compare three formulations of Rx 416 SWP Ardmore Green, the interest being in general performance rather than in any one characteristic. The formulations are:

- RB 3794 -- Guide, Rx 416, card 13, at 21.8% PVC
100 lb. loaded zinc, 175 lb. Micro-Velva, 7980 Permauna Green
- RB 4005 -- Change to 6 lb. of 6630 dry rutile TiO_2 , 50 lb. Micro-Velva, with Nantone 34 and no Permauna, only 11184 and 11185 Shamrock Greens, which are also in RB 3794. PVC is 11.8%
- RB 4004 -- Same as 4005 but leaving out Micro-Velva. PVC is 8.6%. All are semi-alkyd vehicle types. The last two carry 1 gallon of phenyl mercury oleate.

Preparation and Exposure

The panels are cedar bevel siding, primed with Rx 450 SWP Undercoater stained gray. They have been exposed 12 months at Florida and at Chicago, vertical south.

Summary of Results

The Florida tests show a sharp contrast between the guide paint and the specials, which are pretty closely alike. The guide shows some chalking, has gone completely flat, is badly faded and shows considerable dirt but not much mildew growth. The specials show no chalk, good gloss and good color, but look bad because of heavy mildew. The Chicago tests, with mildew not a factor, show just normal dirt on all panels, but the gloss and color changes verify the Florida pattern. Removal of loaded zinc apparently creates a mildew problem which the nominal amount of agent does not solve.

JWC:ls

AME SWP NYC

John W. Chapin

0007-SWP-046094

0007-SWP-000115467

Paint Research Department - December 28, 1954

Progress Report on Exposures 20589-20604 F,C

Kem Tinting Colors in SWP

Purpose

To compare Kem Tinting Colors with regular oil colors, the interest being both in tint-retention and durability. Rx 473 SWP Tinting White is used as the base paint, with 4 ounces of Kem Tinting Color added per gallon, and the comparison paints being shaded to an approximate match with oil colors.

Preparation and Exposure

All tests are on cedar bevel siding, primed with white Rx 450 SWP Undercoater. The left half of each panel is the oil color sample, the right half Kem Tint. The exposures have run 6 months at Florida vertical south, and at Chicago, north and south.

Summary of Results

All panels look generally good, except for dirt and mildew at Florida. There are no appreciable differences between the two halves in gloss, chalking (very slight) or dirt, and no film failure. Fading is relatively slight on all, and the differences, if any, are as follows:

<u>Color</u>	<u>Florida</u>	<u>Chicago</u>
Red	Same	Kem V. sl. more fade.
Orange	Kem V. sl. more.	Kem V. sl. more fade.
Olive	Same	Same
Yellow	Same	Kem V. sl. more.
Green	Kem V. sl. more.	Kem V. sl. more.
Blue	Kem V. sl. more.	Kem sl. more; yellow tends to "go out."
Brown	Same	Kem V. sl. more.
Black	Same	Kem V. sl. more.

JMS:ls

AMM SWP RUF

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Sun Yellow and Related Pigment Tests

Purpose

To evaluate the stability of Sun Yellow pigment, a calcined nickel-treated TiO₂ from Harshaw Chemical Company, their number BL 458, also known as Ti-Tint Yellow and 80 A 14 dry. The material is tried both in Rx 473 SWP Tinting White and in the low PVC Internix White.

Preparation and Exposure

The panels are regular cedar bevel siding primed with Rx 450 Undercoater shaded gray. They have been exposed 6 months at Florida vertical south and slightly longer at Chicago, south only. All tests continue on exposure.

Summary of Results

RB 4541 -- Internix shaded with Hansa	Glossy, good color; excellent except for bad mildew at Florida.
--- Same shaded with chrome	Very bad fading; dirty at Chicago, bad mildew at Florida.
RB 4551 -- Internix made with Sun Yellow	Good. Much like Hansa, but a little more fading at Florida.
RB 4553 -- Rx 473 shaded with Hansa	Not as glossy, not as good color as Internix, but a little cleaner, less mildew.
----- Same shaded with chrome	Fading serious, but not as obvious as in Internix.
RB 4552 -- Rx 473 made with Sun Yellow	Good. Fully equal to Hansa, in fact noticeably better color at Florida.

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