

Cross Ref: Punch Card Index
621 Line
Pigments
Georgia Marble Co.

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MEMORANDUM REPORT NO. M-414

REFERENCE COPY

USE OF "CALWHITE" IN FLAT WALL PAINTS

NOT FOR CIRCULATION

An evaluation of Georgia Marble Company's "Calwhite" (calcium carbonate) as a replacement for Gilders Whiting (W-90) in flat wall paints, has been completed.

The results indicate that there is no real advantage to be gained by using "Calwhite" to replace W-90. "Calwhite" seems to duplicate the performance of W-90 in every respect except that some evidence indicates the use of "Calwhite" yields marginal improvement in whiteness or brightness. This improvement is of such low order, and is so beclouded by inherent batch-to-batch variation and other errors that it cannot be demonstrated statistically.

Details of this evaluation are attached hereto.

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1/7/52

N35436

TABLE I
621-847 and Analogs

(1) P-100-U-5122 and P-100-U-5178 controls

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-315 (RS-7001)	W-41	Zinc Oxide XX-55	.1971
RS-2987 (#2274)	W-92	"Ti-Cal" R-31	5.7487
RS-929 (#3027)	W-90	Gilders Whiting	.3942
#6981 (RS-339)	W-44	Celite #110	.8869
#7228 (#6890)	W-88	Silversheen Mica	<u>.2956</u>

Batches shown in brackets used in P-100-U-5178.

(2) P-100-U-5132 and P-100-U-5188 containing "Calwhite"

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-315 (RS7001)	W-41	Zinc Oxide XX-55	.1971
RS-2987(#2274)	W-92	"Ti-Cal" R-31	5.7487
DS20256(DS22962)	-	"Calwhite"	.3942
#6981 (RS339)	W-44	Celite #110	.8869
#7228 (#6890)	W-88	Silversheen Mica	<u>.2956</u>

Batches shown in brackets used in P-100-U-5188.

(3) P-100-U-5182 and P-100-U-5184 containing W-73.

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-7001 (RS315)	W-41	Zinc Oxide XX-55	.1971
#2274 (RS2987)	W-92	"Ti-Cal" R-31	5.7487
#1849 (#1848)	W-73	"Surfex - CaCO ₃	.3942
RS-339 (#6981)	W-44	Celite #110	.8869
#6890 (#7928)	W-88	Silversheen Mica	<u>.2956</u>

Batches shown in bracks used in P-100-U-5184.

TABLE II

T. & C. FLAT (P-621-R-84784) AND ANALOGS

(1) P-100-U-5130 and P-100-U-5180 controls.

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-315 (RS-7001)	W-41	Zinc Oxide XX-55	.3962
#2588 (#2237)	W-49	"Ti-Cal" R-30	5.1846
DS-22473 (DS22473)	KW-3867	Celite #281	1.2226
RS-929 (#3027)	W-90	Gilders Whiting	<u>1.3018</u>

Batches shown in brackets used in P-100-U-5180.

(2) P-100-U-5134 and P-100-U-5190 containing "Calwhite".

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-315 (RS-7001)	W-41	Zinc Oxide XX-55	.3962
#2588 (#2337)	W-49	"Ti-Cal" R-30	5.1846
DS-22473 (DS22473)	KW-3867	Celite #281	1.2226
DS-20256 (DS22962)	-	"Calwhite"	<u>1.3018</u>

Batches shown in brackets used in P-100-U-5190.

(3) P-100-U-5146 and P-100-U-5186 containing W-73.

<u>Batches</u>	<u>Code</u>	<u>Name</u>	<u>Pounds/Gal.</u>
RS-315 (RS-7001)	W-41	Zinc Oxide XX-55	.3962
#2588 (#2337)	W-49	"Ti-Cal" R-30	5.1846
DS-22473 (DS22473)	KW-3867	Celite #281	1.2226
#3184	-	"Surfex" - CaCO ₃	<u>1.3018</u>

Batches shown in brackets used in P-100-U-5186.

Experimental Details

(1) Calwhite was evaluated as a pound-for-pound replacement for W-90 in "47" Flat (621-847) and in the improved T. & C. Flat (P-621-R-84784). For purposes of comparison, W-73 was also tried as an equal weight substitute for W-90 in these formulas. Duplicate batches of these paints and their controls were prepared using, in most cases, different lots of pigments. All twelve paints were made by the same operator, in random order, over a period of eight weeks.

(2) Previously unpainted, smooth wallboard panels, approximately 1-1/2' x 4-1/2', were given two coats of Primer Sealer. Then, two horizontal strips (approximately 2 inches wide) were painted on each panel with Flat Black (474-4248), and allowed to dry thoroughly. The twelve paints were then applied in random order to the test panels, with five minute laps and at the former viscosities shown in Table III. These panels were compared for hiding, flow, leveling, flashing, shimmers at laps, sheen or flatness, and general overall appearance. Hiding was checked qualitatively by visual inspection of the paints ability to mask the black strips on the brushout panels.

(3) Drawdowns were made in random order of these same paints with a 10 mil. doctor blade over white sections of standard hiding power charts. After overnight dry, Beckman reflectance values were determined and the color difference values relative to MgO were calculated. These values, and the results of a visual rating under a Macbeth lamp are recorded in Table III.

Results

(1) "Calwhite" shows marginal brightness or whiteness improvement over W-90 in the T. & C. Flat formula. However, these results probably reflect batch-to-batch variation and other errors of the test method, rather than any statistically reliable improvement.

(2) At application viscosity, all analogs appear to have about the same hiding power and show approximately the same degree of flashing or shimmers at laps. The application properties of paints made with "Calwhite" appear to be identical with those containing W-90.

(3) Leveling characteristics, pigment settling or separation, and general can stability appear to be unchanged when "Calwhite" is used in place of W-90. Paints containing W-73 show somewhat higher sheen and slightly better leveling. "Calwhite" does not change the sheen.

(4) Philadelphia replacement cost for W-90 is \$.0067 per pound; for "Calwhite" the replacement cost is \$.0111 per pound.

(5) References Experiment A-117 and A-128, Notebook #5337.

TABLE III
"47" Flats

	A	B	C	D	E
P-100-U-5122 621-847 Control	1	2	78	2	3.22
P-100-U-5178 " "	5	4	74	3	3.17
P-100-U-5132 "Calwhite" replaced W90	8	9	76	5	3.89
P-100-U-5188 " " "	12	12	78	3	3.13
P-100-U-5182 W-73 replaces W-90	4	5	78	4	3.17
P-100-U-5184 " " "	7	7	80	1	2.92

T. & C. Flats

P-100-U-5130 P-621-R-84784 Control	11	8	78	5	3.56
P-100-U-5180 " "	10	1	78	2	3.20
P-100-U-5134 "Calwhite" replaces W-90	3	3	78	2	3.12
P-100-U-5190 " " "	6	10	76	1	2.94
P-100-U-5146 W-73 replaces W-90	9	6	78	1	2.91
P-100-U-5186 W-73 " W-90	2	11	80	1	2.64

A = Order of brushouts

B = " " drawdowns

C = Stormer viscosity when brushed

D = Visual rating for whiteness (1=best; 5=worst)

E = Color difference calculated from Beckman reflectance values relative to MgO.
(A difference of 0.2 units is usually apparent by visual inspection and the lower the figure the better the whiteness. On this scale the whiteness of MgO is zero).