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SEPTEMBER RESEARCH REPORT

1964

Coatings and Resins Group

CONFIDENTIAL

GLD012888

N 2284

TRADE SALES PRODUCTSLATEX PAINTS - EXTERIOR

September 1964

Subject: One Coat Spred House Paint
(NT23025BJ362)

Contributors: D. Glauner, N. Petro, W. Kirkpatrick, E. Saville

- Summary:
1. New Orleans exposures indicate mildew might be controlled by using calcium carbonate as the sole inert.
 2. RCR-0400 and V-855 continue to give good results except for a slight tendency to run.
 3. Zinc oxide has performed satisfactorily to date in the acrylic alkyd formula.
 4. The field test program is continuing.
 5. Crystal Form in paints during Cowles grinding when a silicate and surfactant are present. Calcium carbonate eliminated the crystal formation thus making possible the production of Spred House Paint on the Cowles.
 6. The stability of RCR-0400C is sufficiently good to grind the pigments in the latex. This makes possible the grinding of complete paints in the pebble mill resulting in much better and smoother dispersions.
 7. Mildew has become a problem in the Southeastern Region. It may have been caused by a low mercury content in the fungicide.

Discussion: Exposure Examination

3-94, 3-95. A large series evaluating various combinations of oils and alkyds. A straight acrylic latex with a long oil linseed alkyd has given the best result. (RCR-0400 and V-855). When using V-879 (styrene acrylate) in combination with oils and alkyds cracking develops and the paint yellows. RCR-0400 - V-855 has the disadvantage of early dirt collection but these paints clean up by chalking to a very white paint. On these series the Hut has shown some small, fine blisters, however these seemed to be caused by the primers.

An acrylic-alkyd formula containing Busan is very dirty and has checked severely due to poor film formation because of the presence of heavy metal ions.

Acrylic-alkyd formulas containing zinc oxide can be made satisfactorily with the proper surfactant selection.

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N-4-10, 6 months - This series has given an excellent comparison between calcium carbonate extenders and clay and talc for mildew control. Every paint containing large amounts of calcium carbonate was free of mildew whereas paint with other inerts were heavily infested. There was no chalk to have caused the difference by cleanup.

Field Testing Program

The acrylic alkyd, Cargill and A.D.M. paints have been made and shipped to Portland, Minneapolis, Cleveland and Boston. The houses from Florida and New Orleans have been slow in coming in and we are waiting for further information from these areas.

Lap Sheen of Alkyd Modified Acrylics

Alkyd modified acrylic paints of RCR-0400 type seem to have slight lap sheen, with a combination of Alsilate "W" and Nyltal 300. ME4-254-1 (Table 3). It seems that, to a certain degree, the higher the overall sheen the less noticeable is the lap sheen, or to approach extreme flatness with silicas. The latter may have an adverse affect on dirt collection. The inerts tested to improve lap sheen are the following:

		Formula No.	Sheen- Over All
(W-220)	ASP-100	ME4-268-1	Highest
(W-154)	Camel White	(ME4-272-2 & ZE4-272-3)	High
(W-121)	Snowflake 50/50 Lorite	ME4-246-2	Low
	Duramite	ME4-246-1	Low
(W-173)	ASP-400	ME4-266-3	Low
(W-121)	Snowflake	ZE4-272-1	Fairly Low

ASP-100 rated best for sheen uniformity, Camel White second with fairly good uniformity. Combination of Snowflake and Lorite for use in Tint Base seemed fairly good. Lap sheen was quite evident with Snowflake, Duramite or ASP-400. Surfex MM with low sheen in ME4-272-1 showed lower lap sheen than Snowflake but not as good as Camel White or ASP-100.

ME4-258-1 unmodified acrylic paint seemed good at laps with Alsilate "W" and Nyltal 300. Further studies are being conducted.

Grinding of Complete Paint Formulations

Roll stabilities of 9-12 days encouraged the grinding of paste with letdowns charged in the pebble mill. ME4-248-1, ME4-254-1 (Table 1 & 3) showed no apparent change in rheological properties other than a very smooth grind fineness, after 8 hours of pebble milling of the finished paints.

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A study is being made to improve the technique for the

possibility of manufacturing paints in this manner. Attempts were made to omit VM-885 (W.S.Acrylic) as a stabilizer ME4-262-1, ME4-265-1 (Table 2), but this cut roll stability to 24 hours.

ZE4-269-1 with potassium carbonate and ZE4-269-2 with Borax (Table 3) have not improved roll stability.

NH₄OH added to paint with K₂CO₃ to pH 10.0 improved roll stability to 4 days.

Crystal Formation

Crystal formation in paints made with Cowles Dissolver seem to be tied in with the presence of Silicates. Paints with calcium carbonate as the sole extender do not have this problem. Formulations for described study are: ME4-272-1, ME4-272-2, ZE4-272-1, ZE4-272-2, ZE4-272-3 (Table 1 & 2).

Fungicide Study

ZE4-254-1, ZE4-254-2 - Linseed oil modified acrylics, made with 1.5 lb. and 3.0 lb. fungicide for long term evaluation. A sample of ZE4-253-1 (Table 3) without fungicide was sent to Troy Chemical for their evaluation of non-mercurial bactericides and fungicides.

The Southeastern Region has had several complaints of poor mildew resistance of the Y-3600 EK formula. An increase in mildewcide level is being considered for this region only. However, subsequent tests have indicated CH-380, phenyl mercuric borate, has been low in mercury content. The mildewcide is being analyzed.

Calcium carbonate is being fully evaluated to aid mildew control.

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TABLE 1

	ZE4 &		ME4 -		ME4 -		ME4 -		ZE4		ZE4	
	ZE4 -	ME4 -	ZE4 -	ME4 -	ZE4 -	ME4 -	ZE4 -	ME4 -	ZE4	ME4	ZE4	ME4
	245-1	246-1	245-1	246-1	245-2	258-1	272-1	272-2	272-3			
S-14	47.5	67.8	do	do	do	115.0	85.0	do	do	do	do	do
CH-181	14.0	14.0	do	do	do	do	do	do	do	do	do	do
CH-473	3.0	do	do	do	do	do	do	do	do	do	do	do
CH-450	7.0	do	do	do	do	do	do	do	do	do	do	do
CH-474	4.0	do	do	do	do	do	do	do	do	do	do	do
CH-447	2.5	do	do	do	do	do	do	do	do	do	do	do
195T-27	220.0	--	--	--	--	--	--	--	--	--	--	--
W-208	225.0	220.0	225.0	220.0	225.0	220.0	210.0	do	do	do	do	do
W-91	--	30.0	--	30.0	--	30.0	40.0	do	do	do	do	do
W-121	75.0	--	75.0	--	75.0	--	128.0	--	--	--	--	--
W-188	75.0	66.4	--	66.4	--	101.7	--	--	--	--	--	--
	--	65.0	--	65.0	--	--	--	--	--	--	--	128.0
W-154	--	--	--	--	--	--	--	125.2	--	--	--	--
W-108	--	--	--	--	--	--	--	--	--	--	--	--
W-223	--	--	--	--	--	30.0	--	--	--	--	--	--
CH-380	1.5	do	do	do	do	do	do	do	do	do	do	do
VM-885	75.0	do	do	do	do	--	83.3	do	do	do	do	do
	--	--	--	--	--	--	--	--	--	--	--	--
V-855	66.4	do	do	do	67.0	--	--	--	--	--	--	--
S-148	12.0	do	do	do	do	--	66.4	do	do	do	do	do
VM-432	5.0	do	do	do	do	--	12.0	do	do	do	do	do
VM-433	1.5	do	do	do	do	--	5.0	do	do	do	do	do
CH-444	4.0	do	do	do	do	--	1.5	do	do	do	do	do
RCR-0400-C	283.0	do	do	do	do	483.0	4.0	do	do	do	do	do
	--	200.0	do	do	do	--	283.0	do	do	do	do	do
	--	--	--	--	--	125.0	--	--	--	--	--	--
	do	do	do	do	do	do	175.0	do	do	do	do	do
PVC = 35%	100 gal.	do	do	do	do	do	do	do	do	do	do	do
Yield	37 gal.	do	do	do	do	do	do	do	do	do	do	do
Solids Volume												

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TABLE 2

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	ME4 - 262-1	ME4 - 265-1	ME4 - 266-1	ME4 - 265-2	ME4 - 266-2	ME4 - 272-1	ME4 - 272-2
S-14	153.8	do	170.5	do	60.0	85.0	do
CH-181	14.0	do	do	do	do	do	do
CH-473	3.0	do	do	do	do	do	do
CH-450	7.0	do	do	7.0	do	7.0	do
CH-474	4.0	do	do	4.0	do	4.0	do
CH-447	2.5	do	do	do	do	do	do
W-208	150.0	do	175.0	do	200.0	175.0	do
W-91	220.0	do	do	do	do	do	do
W-223	30.0	do	do	do	do	do	do
W-188	30.0	do	do	do	do	do	do
W-108	101.7	96.0	do	101.7	96.0	do	do
W-154	--	--	--	--	--	125.8	--
CH-380	--	--	--	--	--	--	128.7
VM-885	1.5	do	do	do	do	do	do
W-274	--	--	83.3	do	do	do	do
V-855	5.0	5.0	do	--	5.0	--	--
S-148	66.4	do	132.8	do	66.4	do	do
VM-432	12.0	do	do	do	do	do	do
VM-433	5.0	do	do	do	do	do	do
CH-444	1.5	do	do	do	do	do	do
RCR-0400C	4.0	do	do	do	do	do	do
CH-280	322.0	do	121.0	do	283.0	do	do
Kelecin 1081	--	4.0	do	--	4.0	--	--
	--	6.0	do	--	6.0	--	--
PVC	35%	do	do	do	do	do	do
Yield	100 gal.	do	do	do	do	do	do
Solids Volume	37 gal.	do	do	do	do	do	do

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TABLE 3

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	ZE4-253-1	ME4-266-3	ME4-268-1	ME4-260-1	ME4-260-2	ZE4-246-1	ZE4-269-1	ZE4-269-2
S-14	85.6	93.3	do	33.3	46.3	47.5	153.8	do
CH-181	14.0	do	do	do	do	do	do	do
CH-473	3.0	do	do	do	2.0	3.0	do	do
CH-450	7.0	do	do	do	4.0	7.0	do	do
CH-474	4.0	do	do	do	4.0	do	do	do
CH-447	2.5	do	do	do	do	do	do	do
W-208	182.2	175.0	do	do	do	do	150.0	do
W-91	220.0	do	do	do	116.0	do	220.0	do
W-223	30.0	do	do	do	do	do	30.0	do
W-188	30.0	do	do	30.0	do	do	30.0	do
W-173	101.7	do	do	101.7	112.2	do	101.7	do
W-220	--	122.3	123.0	--	--	--	--	--
	--	--	--	--	--	--	2.0	--
	--	--	--	--	--	--	--	2.0
	--	--	--	--	--	--	--	--
CH-380	1.5	do	do	do	do	do	do	do
VM-885	75.0	do	do	do	do	do	do	do
195T-27	--	do	do	235.0	220.0	do	do	do
V-855	66.4	do	do	do	do	do	do	do
S-148	12.0	do	do	do	do	do	do	do
VM-432	5.0	do	do	do	do	do	do	do
VM-433	1.5	do	do	do	do	do	do	do
CH-444	4.0	do	do	do	do	do	do	do
RCR-0400	283.0	do	do	do	do	do	do	do
	--	--	--	4.0	3.0	--	--	--
	--	--	--	--	2.0	--	--	--
	--	--	--	6.0	--	--	--	--
	--	--	--	--	110.0	do	--	--
Lecithin								
Kelecin 1081								
W-121								
Snowflake								

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Oil Emulsion Paints

Sherwin Williams released their new formula for Linopol, their linseed oil emulsion, this month. This formula has cured their lapping problem and apparently has not hurt the good qualities present in earlier formulas. The brushing is good and there has been an improvement in water sensitivity. Sherwin Williams has increased the PVC from 35 to 41 and raised the level of Celite 281 from 25 to 125 lbs. No results on the exterior durability of this formula are available as of yet.

Uniformity of sheen continues to be a problem with Cargill 1308 formulas. Replacing Nylal 300 with Duramite, a large particle size calcium carbonate has not helped (EE4-253-1). A forty PVC paint at 48% solids eliminated the lap sheen but adversely affected the brushing (EE4-273-1). Data on stability and durability will not be available for some time. Direct substitution of Cargill 1308 for Linopol in Sherwin Williams' new formula cured Cargill's sheen problem and looks favorable to date (EE4-274-1).

In Archer Daniels Midland's formula KTPP was substituted for TKPP to improve stability. No results are available at this time (EE4-253-2).

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		<u>EE4-253-1</u>	<u>EE4-253-2</u>	<u>EE4-255-1</u>
W-208	Rutile TiO ₂	175.0	150.0	150.0
W-91	Anatase TiO ₂	50.0	50.0	--
W-188	Nyral 300	--	75.0	--
W-173		--	--	142.0
M-239	Cellite 281	--	--	35.0
ZZZ55L0	Zinc Oxide	125.0	150.0	125.0
Duramite	Calcium Carbonate	95.6	--	--
CH-473		--	--	6.0
CH-468	KTPP	6.0	3.0	--
Tergitol NPX		--	10.0	--
CH-322	Tamol 731	12.0	--	12.0
CH-280 (24%)	Triton X-100	16.0	--	18.0
M-484	Surfynol TG	2.0	--	2.0
CH-181	Ethylene Glycol	12.0	28.0	12.0
VM-659	Super-Ad-It	2.0	6.0	2.0
Foamicide 581-B	Defoamer	4.0	2.0	4.0
Natrosol 250HR 2½%	Thickener	30.0	--	40.0
CH-335	Acrysol G-110	15.0	15.0	15.0
Advacar 24% Pb	Driers	9.0	5.0	9.4
Advacar 6% Co	Drier	2.2	2.0	2.4
Advacar 6% Mn	Drier	2.2	2.0	2.4
Cargill 1308	Linseed Oil Emulsion	367.0	--	373.4
Arolin 1652	Linseed Oil Emulsion	--	230.0	--
S-14	Water	245.0	343.0	205.0
195-T-27	Natrosol 250MR (3%)	--	80.0	--

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		<u>EE4- 226-1</u>	<u>EE4- 267-1</u>	<u>EE4- 268-1</u>	<u>EE4- 274-1</u>	<u>EE4- 273-1</u>
W-208	Rutile TiO ₂	180.	do	do	do	255.
W-91	Anatase TiO ₂	45.	do	do	do	72.
W-188	Nytal 300	50.	do	do	do	145.
M-239	Celite 281	125.	do	do	do	--
W-35	12% Leaded Zinc Oxide	140.	--	140.	do	--
W-33	Zinc Oxide Lead Free	--	47.	--	--	--
W-249	18% Leaded Zinc Oxide	--	93.	--	--	--
ZZZ55L0	Zinc Oxide Lead Free	--	--	--	--	181.
Famol 850		7.	do	do	do	--
M-484	Surfynol TG	--	--	--	--	2.
CH-468	KTPD	--	--	--	--	6.
CH-322	Tamol 531	--	--	--	--	12.
CH-280(25%)	Triton X-100	--	--	--	--	16.
CH-181	Ethylene Glycol	8.	do	do	do	12.
CH-335	Acrysol G-110	--	--	--	--	15.
VM-659	Super-Ad-It	--	do	do	do	2.
Natrosol 250 HR(2%)	Thickener	114.	do	do	170.	--
"	" (2.5% "	--	--	--	--	25.
Advacar 24% Pb Drier		8.	do	do	do	9.
"	6% Co "	6.	do	do	do	2.2
"	6% Mn "	--	--	--	--	2.2
Foamicide 581-B	Defoamer	--	--	--	--	4.
Balab Bubble Breaker #748	Defoamer	2.	do	do	do	--
Linopol	Linseed Oil Emulsion	350.	do	do	--	--
Cargill 1308	" " "	--	--	--	296.	327.
S-14	Water	200.	do	do	do	134.4

Field Trials

RFT64054 EE4-255-1, Gray Cargill 1308
Mr. Donald A. Visci, 979 Pembroke, Cleveland
Hts.

RFT64058 & 64059 EE4-267-1 and EE4-268-1, White Linopol
Mr. Donald Casey, 8108 Tyway, Olmstead Falls

Subject: Spred Glide-On

Contributors: J. Sainsbury, F. Scheimann

Summary: The complete Spred Glide-On line formulas have been
re-issued, with VM-894 Latex replacing VM-844. We are
continuing to check all productions of VM-894 in Glide-On,
in all three Glide-On Tint Bases.

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