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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

PIGMENT GREEN B LAKES

K-1638, K-1639, K-1642, K-1643

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Final Report

PIGMENT GREEN B LAKES

K-1638, K-1639, K-1642, K-1643

February 2, 1942 - March 13, 1942.

SUBMITTED BY: A. A. Brizzolara

DATE SUBMITTED: 9/29/44

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A. M. Erskine
10/9/44.

INTRODUCTION:

Due to interest in Pigment Green B for use in camouflage finishes and an expected increase in volume of business, the possibility of preparing lakes similar to GE-578-D by slurry mixing methods was studied. Special lakes for paint use were developed. Some attention was also given to developing softer GE-578-D and GE-496-D lakes in order to minimize the bad wearing effects of these lakes on the pulverizer screens during grinding.

SUMMARY & CONCLUSIONS:

Lakes similar to GE-578-D but prepared directly from the pigment slurry resulted in loss of strength. Filtration of the GE-578-D lake was very slow. The use of Celite in amounts up to 50% greatly improved filtration rates and yielded much softer products. The incorporation of 3-5% of Alkanol B in place of bindex and sodium oleate in the standard formulas for GE-496-D and GE-578-D rendered the lump colors very soft without any deleterious effects on other properties. Lakes of pulps treated with diphenylguanidine and urea displayed no properties of interest.

"K" samples were prepared for 7% and 15% lakes on a 85:15 barytes/celite base and for 7% lakes on a 50:50 barytes/clay base. The former were paste mixed and the latter were slurry mixed. The following tabulation lists the "K" samples with compositions and pertinent data:

	<u>K-1638</u>	<u>K-1639</u>	<u>K-1642</u>	<u>K-1643</u>
Laboratory number	965-12-A	965-12-B	965-9-C ₁	965-9-C ₂
Manufacturing method	paste	paste	slurry	slurry ²
TF Method	132-7	132-7	52-10	132-7
Pigment Green B	7	15	6.90	6.90
Barytes	79	72	46.05	46.55
China Clay			46.05	
Celite #110	14	13		46.55
Chemical #56			1.00	

DETAILED DISCUSSION OF RESULTS:

Slurry Mixing: A number of experiments were conducted to determine the feasibility of preparing lakes of the GE-578-D type directly from unfiltered Pigment Green slurry. The treating agents and dry extenders were stirred into the slurry, which was then filtered and washed free of alkali. It was found that 15-20% strength would be lost in preparing a match for GE-578-D by slurry mixing. When various extenders were tried alone, their relative strengths were in the order: China Clay, Asbestine, Celite, Barytes.

In 50-50 combination, barytes/clay was the strongest by 25%, but barytes/celite filtered 10 times as rapidly and washed even more rapidly, yielding a very soft product by comparison. More barytes and less celite yielded a product which was harder, weaker in brushout and rubout, had lower oil absorption, and was less fast to light. With more barytes and less clay, the products showed some weakness after the ratio 75:25 was passed. Clay, in comparison with celite, showed, in general, a tendency toward slight weakness in rubout, slight strength in brushout, increased hardness of lump color and increased time to filter. The same was true with barytes-clay compared with barytes-celite.

Slurry mixing without Compound #3 gave a product weaker in brushout and rubout. Sodium oleate seemed to have little effect on strength, but inhibited the drying of masstones in R-108 oil. The addition of 3-5% Alkanol B to the controls by paste mixing and by dry mixing caused no undesirable changes and yielded a softer color.

The effect of variations in the laking procedure was also studied with 50:50 lakes of barytes/china-clay and barytes/celite. Drawing a water from the slurry before laking, and drawing a water from the lake-slurry after settling gave products slightly stronger in brushout and slightly weaker in rubout to the standard procedure. Neutralizing the slurry with acetic acid and also treatment with diphenyl guanidine yielded products showing marked improvement in filtration time. In brushout, the D.P.G. product was slightly weaker than the neutralized product, (Barytes/Clay) and both were weaker than control. In rubout of the barytes/celite lakes the two products were equal and slightly stronger than control.

In general, the china/clay/barytes lakes take about 15 times as long to filter as do the celite/barytes lakes. The yields are 1-2% greater with the celite/barytes lakes.

Experiments 865-7, 8, 9.

Paste Mixing of GE-578-D:

The paste mixing, according to GE-578-D, of 75:15 lakes of barytes/celite shows a decrease in strength with increasing amounts of water, and a minimum should be used. Leaving out Compound #3, sodium oleate, and Alkanol B, in turn, increased the strength, and the strongest products were those which contained no treating agents. There was a pigment strength loss of about 25% in the 15% lakes - compared with the 7% lakes on an equal P.G.B. basis with the untreated samples, but in those treated with Compound #3 and sodium oleate, there was no apparent loss. That is, leaving out the treating agents greatly increases the strength of the 7% lakes, but does not increase the strength of the 15% lakes very much.

Lakes of pulps treated with D.P.G. and Urea by K-1313:

When samples of Pigment Green slurry were treated according to the K-1313 formula with diphenyl guanidine and with urea, the urea reduced the filtration and washing times to about 1/2 and the D.P.G. reduced the times to about 1/6. The urea product was fluid, but the D.P.G. product was a solid at 21%. They were about equal and 10% weak in brushout. In rubout the D.P.G. product was a check to K-1313; the urea product was 20% weak. Neither treatment affected the bleed of the original slurry. When incorporated into paste mixed lakes of 50:50 barytes/clay (brushout) and barytes/celite (rubout), the urea pulp was equal in brushout and slightly stronger in rubout against control, while the D.P.G. product was slightly weak in rubout and 10-20% weak in brushout. Thus, for a water dispersible lake the urea product might be justified, but it would hardly be justified in oil, though the lake is 2-5% stronger.

Experiments 965-11, 17

Preparation of K samples:

K-1638, 1639, 1642, 1643, were prepared in 5 lb. batches for evaluation by the Paint Laboratory. K-1638 and 1639 are 85:15 barytes/celite lakes, 7 and 15% respectively, paste mixed, with no treating agents. K-1642 and 1643 are 7% lakes on 50:50 barytes/clay and barytes/celite, respectively, slurry mixed, with no treating agents.

Experiments 965-12

EXPERIMENTAL DETAILS (Notebook No. 965)

<u>Expt. No.</u>	<u>Object</u>
965-7	Preparation of lakes similar to GE-578-D by slurry
8	mixing of Pigment Green B with miscellaneous extenders.
9	The slurries were treated with various agents prior to
17	filtration.
965-11	Preparation of 7% and 15% lakes by paste mixing of
13	Pigment Green B press cake and miscellaneous extenders.
965-9	K-1642 and K-1643
965-12	K-1638 and K-1639
965-13	Effect of Alkanol B on texture of GE-578-D and GE-496-D
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