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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Progress Report

Title: [illegible]

Period Covered: March/April 1950.

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NEWARK PLANT

PIGMENT COLOR RESEARCH REPORT

Progress Report

Title: MICROATOMIZER GRINDING OF PIGMENTS. EFFECT ON "MIX-IN" PROPERTIES IN ALKYD.

Period Covered: March/April 1950.

Charge: A-10-11-4

SUBMITTED BY: R. R. DENSLOW DATE SUBMITTED: 4-5-50

APPROVED BY: B. H. PERKINS. DATE ISSUED: 4-13-50

B. H. Perkins 4/10/50

INTRODUCTION:

Recent tests on microatomized Chrome Greens have shown this type of grinding to give a marked improvement in "mix-in properties" compared with controls micropulverized in the conventional manner. In view of these results, it was decided to test other microatomized pigments, namely the products prepared in 1945 and discussed in Research Report KN-45-51. The results are presented below.

SUMMARY & CONCLUSIONS:

1. Tests have been run on microatomized samples of Medium Chrome Yellow, Light Chrome Yellow, Lithol Red and Iron Blue.

2. Rate of wetting of the microatomized samples was approximately the same as that of the controls.

3. Dusting was more evident with the microatomized samples than with the controls. As might be expected, it was worse with the Lithol and Iron Blue than with the Chrome Yellows.

4. In all cases, the microatomized samples showed an improvement over the controls in respect to grit (Hegman gauge) in the 15% PV "enamels". The microatomized Light Yellow gave a "mix-in" paint fully equal to the ball milled sample; none of the others were as good. However, the (microatomized) Medium Yellow and Lithol would probably also be rated as "mix-in pigments" since for many purposes the paints could be used "as is" or after a single rapid pass over a roller mill. The microatomized Iron Blue was very definitely better than the control but not as good as the other pigments.

5. The differences in masstone color were relatively slight except in the case of the Iron Blue. Here, the "mix-in" paint from the conventionally pulverized pigment was quite light compared to the ground paint. The other mix-in paints were likewise light but the differences were very slight. The grit differences indicated by the Hegman gauge showed up fairly distinctly in the masstone exhibits.

6. Substantially complete strength development was apparently achieved in all the ball-milled paints, the tints from control pigment and microatomized samples being practically equal. In the case of the Lithol and Iron Blue, the "mix-in" paints were weaker than the ground paints. In the case of the Iron Blue, the mix-in paint from the microatomized sample was appreciably stronger than the mix-in paint from control pigment. The yellows showed little or no difference in tint resulting from either the method of grinding the dry pigment or the method of dispersion in a vehicle. This is attributed to the absence in the yellows of small aggregates such as are presumably present in the red and blue.

It should be emphasized that the above conclusions are based on single tests in which, as indicated below, the optimum conditions of pigment/binder ratio, mixer load, etc, may not have been established.

The microatomized samples covered in the present study, together with the microatomized Chrome Greens mentioned earlier in this report, represent the closest approach to mix-in characteristics achieved to date. On the basis of our present knowledge and experience, it appears probable that this is due chiefly or entirely to the dry fineness and uniformity of products pulverized in this equipment.

EXPERIMENTAL DETAILS:

The testing method involved the slow addition of pigment to alkyd (GE-2466) in a change can mixer at a pigment/binder ratio sufficiently high to give a very heavy paste. After wetting, the mixer was run for 30 minutes and the resulting mill base let down with additional alkyd to a PVC of 15%. Thinner was added to give a Stormer consistency of 70 KU and a portion of this paint was given a mild (16 hrs./0.5 pint jar) ball mill grind. The mix-in and ground products were evaluated for masstone appearance, tint and grit (Hegman gauge). During the mixing step, qualitative observations were made on ease of wetting and tendency to dust.

No study was made of the effect of varying the pigment/binder ratio; the formulas were set up simply on the basis of past experience and, judging from the character of the various mixer pastes, appeared fairly satisfactory. However, it is possible that better results might have been obtained at a higher (or possibly slightly lower) consistency or at a different mixer load.

The samples comprised Medium Yellow, Light Yellow, Lithol Red and Iron Blue. In each case, there was a control sample and a microatomized sample. The yellows were batch products of semi-works manufacture, superior in wedge grit texture to our current 12 Bldg. material. The blue was likewise a semi-works product, made by the "sealed vat" technique. The Lithol Red was a plant product; details as to its manufacture are not known.

The experimental results are presented in the attached table.

REFERENCE:

KN-45-51 - Pulverizing Study Using Micronizer and Microatomizer. J. R. Borst.

KN-46-49 - Microatomizer Grinding of Chrome Greens.E.C.Botti.

Notebook - 1263 - Expt. 1263-83
1366 - Expt. 1366-2

MIX-IN TESTS ON MICROATOMIZED SAMPLES

Pigment	Prep.of Mill Base P/B*	Mix. Time	Dusting	Hegman Gauge Readings 15% PV Mix-in	Grind	Character of Paint Mix-in vs. Grind Masstone	Tint
Medium Yellow							
K-1958, 7697	70/21	6'	v.sl.	2-3	9-10	vvs/vs lt.,gritty	ca. equal
" " (microat.)	"	5+'	sl.	7-8	9-10	" ,vs.gritty	"
Light Yellow							
K-2024, 7692	70/21	4+'	v.sl.	5-6	9-10	vs.lt.,vs.gritty	ca. equal
" " (microat.)	"	4+'	sl.	9-10	9-10	vvs.lt., ok	"
Lithol Red							
RT-425, 20115	50/50	5+'	Bad	4-5	9-10	vvs.lt.,vs.gritty	vs.wk.(ca.105) sl.streaking
" " (microat.)	"	4'	V.Bad	6-7	9-10	" ,sl.hazy	s.wk.(ca.110)
Iron Blue							
K-1661, 7557	53/47	3'	sl.	0	6-7	light,v.gritty	wk.(ca. 120)gritty
" " (microat.)	"	2+'	v.bad	5-6	8-9	vs.lt.,vs.gritty	wk.(ca. 110)

*Vehicle: Alkyd GE-2466, 70% resin solids.
The tabulated figures are on a 100% resin basis.

Reference: 1366-2.