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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Progress Report

FLUSHED COLORS.

Period Covered: July 20, 1945 to November 5, 1945.

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NEWARK PLANT

PIGMENT COLOR RESEARCH REPORT

Progress Report

FLUSHED COLORS.

July 20, 1945 to November 5, 1945.

SUBMITTED BY: *A. J. Stratton* 11/26/45

DATE SUBMITTED: 11/5/45

APPROVED BY: *A. A. Brizzolara* 11/26/45

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INTRODUCTION:

Interest in the possible manufacture of flushed colors at Newark has been revived and a limited amount of laboratory work has been carried out to determine the feasibility of the operation with certain colors and to obtain the necessary information for preliminary cost estimates on equipment.

SUMMARY AND CONCLUSIONS:

The major effort has been devoted to the following three products:

1. K-2145 (PTMSA-BN Red) flushed in lithographic Varnish
2. "Monastral" Blue flushed in lithographic varnish.
3. "Monastral" Blue flushed in alkyd,

It may be safely concluded that all three products can be readily manufactured in a kneading type vacuum mixer. In the case of the litho varnish inks, if it can be assumed that the ink formulator must give his product at least one pass over a roller mill, the base inks from the mixer can probably be marketed without further treatment. It is doubtful if entirely satisfactory inks for fine printing could be obtained by simple mixing of the products made to date.

In the case of alkyd mill bases, additional grinding does not significantly improve the strength. However, entirely satisfactory enamels have not been made from any of the mill bases as yet either before or after extra grinding. This may be a function of the break down to the enamel. On the other hand, it may not be important with "Monastral" Blue which will be used only as tints.

As to color, K-2145 can be flushed and dried to an endpoint of color change which is considerably darker, bluer and probably stronger than can be obtained from a dry color in the usual operations. The dry color can be changed to the same form by passing the ink over a very hot roller mill.

"Monastral" Blue BF when flushed into either varnish or alkyd shows a strength advantage over BT-172-D in the order of 25%. The full shade enamel in alkyd shows much higher gloss than BT-172-D, more nearly resembling BP-173-D in this respect.

Previous to the work on these colors a small amount of work was done on flushing Maroon Toner RT-551-D into alkyd. The color used was very low in solids content and, although a transfer seemed to take place with some water apparent, no satisfactory consolidation to an oily paste was obtained. It seems highly probable that proper physical conditions and the selection of a suitable transfer assistant will overcome this trouble and make the operation possible.

DISCUSSION OF OPERATION AND RESULTS:

The work to this point enables only rough estimates to be made of the probable operating conditions. Some transfer assistant seems to be desirable and probably necessary to obtain really satisfactory decanting of the major part of the water. Although Fixanol (cetyl pyridinium bromide) is an excellent agent as well as other quaternary salts of a similar nature, it appears that Turkey Red Oil will satisfy all requirements and is, as far as we know, free of any patent domination, although there is an ICI patent (U.S. 2,219,395) presumably available for our use which covers a combination use of cation active agents with sulfonated fatty oils such as Turkey Red Oil.

Using such an assistant in the aqueous paste prior to the addition of the oil, it was possible to decant from 85% to 90%, or even slightly more in some cases, of the water present with substantially no loss of color. Without a transfer assistant, there was a marked tendency for CPC to re-emulsify, particularly in the alkyd. This operation was also affected by the pigment content of the final oil paste, higher pigmentations favoring the transfer. Obviously, too stiff pastes are undesirable from the standpoint of handling, particularly when working in additional oil and a compromise is necessary. The following conditions were tentatively selected as optimum:

K-2145: Flush at 40-50% Pigment - Finish at 40%

CPC in Varnish: Flush at 30-35% - Finish at 27%

CPC in alkyd:- Flush at 35% - Finish at 20%

The mixer load is an important consideration and varies with the consistency of the paste, the heavier pastes requiring smaller loads. Too large a mixer load with heavy pastes gives serious difficulties with bridging, particularly when vacuum is applied.

With 85-90% of the water decanted the remaining water can be removed at 180°F under a vacuum of 25-27 inches in about 1.5 hours. In the case of K-2145 it requires about another 1.5 hours to reach the endpoint of color change. It is not known whether this results from the slow removal of traces of water (too little to appear in the condensing system) or whether it is purely a heat effect.

With the alkyd resin solutions, the removal of water is accompanied by the removal of a considerably larger quantity of solvent which must be replaced either by condensing and returning that evaporated or by the addition of fresh solvent. Actually, it was impossible to avoid some loss of solvent and it is necessary to add a substantial amount of fresh solvent in any case. At present it is necessary to estimate the amount to add and this may or may not be difficult on a larger scale.

EXPERIMENTAL DETAILS: See N.B. 1138, Expts. 11 to 35 inclusive.
p.p. 45 - 107 inclusive