

E. I. DU PONT DE NEMOURS & COMPANY
PIGMENTS DEPARTMENT
256 VANDERPOOL STREET
NEWARK, NEW JERSEY

Copy No. 1

LIBRARY COPY

171.0

NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

WATER DISPERSIBLE LAKES: SEMI-WORKS & PLANT

Period Covered: Sept. 44 - May 1946.

FILE:

DATE: 8/1/46

KH-46-47

Serial No. ERI-46-47

Copy No. 1

Copy to:

- #1 - Numerical File
- 2 - Research Office (171)
- 3 - Library File (171)
- 4 - #10 Building File
- 5 - #6 " "
- 6 - Imperial Chemical Industries, Ltd.
- 7 - " " " "
- 8 - " " " "
- 9 - W. F. Spengeman, Newark
- 10 - Extra

NEWARK PLANT

PIGMENT COLOR RESEARCH REPORT

Final Report

Title: WATER DISPERSION LATES: GEL-WORKS AND PLANT.

Period Covered: September 1944 - May 1946.

SUBMITTED BY:

J. H. Baird
J. H. Baird

DATE SUBMITTED: July 18, 1946

APPROVED BY:

J. C. Morrison
J. C. Morrison
7/24/46

DATE ISSUED : 8/1/46

N39995.01

DUP050150429

INTRODUCTION

In the fall of 1944, laboratory work on our line of water dispersible lakes had progressed to the point where semi-works trial was deemed desirable (see KN-46-13). Consequently a high spot development study was initiated in the semi-works to result ultimately in final plant standardization of each of the colors in this line.

Following a brief semi-works development period which was concerned principally with study of drying variables, a basis for plant standardization was agreed upon. It was decided that three or more lakes of each color would be made, using three separate batches of representative toner, then dry-blended together to produce approximately 500 lbs. of standard material.

SUMMARY & CONCLUSIONS

Plant standards have been set-up and formulas written, based on plant experience, for the water dispersible lakes listed below.

<u>CODE</u>	<u>K #</u>	<u>LAKE OF</u>	<u>TONER PULP</u>
GP-649-D	2304 (Plt.)	Brilliant Green PTA	K-2314 (GT-347-D)
RL-260-D	2305	Methyl Violet PTMA	2315 (RT-122-D)
BP-262-D	2306	Victoria Pure Blue EO PTMA	2316 (BT0181-D)
RL-554-D	2307	Toluidine Red	2317 (RT-232-D)*
RL-555-D	2308	Watchung Red	2318 (RT-426-D)
RP-556-D	2309	Rhodamine 6GDN - PTA	2319 (RT-357-D)
RE-557-D	2310	"Duel" Red	2320 (RT-283-D)
RL-558-D	2311	Maroon Toner	2321 (RT-521-D)
YL-556-D	2312	Hansa Yellow	2322

*Modified to omit accessory agent MNPA.

Work on breaker Victoria Blue PTMA, K-2137, (coded RL-261-D) was dropped by division of Sales.

Two noteworthy exceptions to the laboratory formulations were necessary:

(1) In some cases additional extender was added to the plant standard mix to match the laboratory standard strength. This added China Clay was incorporated into the standard formula, thus revising slightly the toner/agent/extender ratio set-up by the laboratory. Yields and costs were revised accordingly.

(2) The supply of Compound #8, 5 flakes having been cut off, all colors were standardized using a substitute dispersing agent, Blancol Concentrated Powder (General Dyestuffs), chemically similar to Compound #8.

DISCUSSION OF RESULTS

Making: With one exception, all WD lakes are manufactured simply by blending the toner, in pulp form, with dispersing agent and extender in four

set-ups (approx. 160 lbs. each) in the plant 55 gallon Abbe Lenart Mixer. The exception is RE-557-D which incorporates BaCl_2 in the formula to precipitate sulfate present in the dispersing agent. If allowed to remain, these impurities might affect the shade by interaction with the barium "Duol".

In each case, a small amount of dispersing agent (10% of the total) is added to the mixer before adding the toner pulp. This serves to slurry up the toner more readily. The remaining agent is added after all the toner is in the mixer.

The present batch size of each mixer charge has been regulated to obtain optimum mixing (i.e. maximum amount through louvers in side of basket, minimum of tumbling over top of basket). There is also a considerable amount of foaming which must be kept at a minimum by strict adherence to the stirring times specified by the formula.

The amount of water used must be kept to a minimum (± 1 gallon) in order to prevent separation of the pigment from the slurry as a hard agglomerate. Consequently in discharging the mixer, to avoid yield loss, troweling and equegeeing the sides and bottom of the mixer are substituted for rinsing with water.

Drying

The majority of semi-works development work involved a high spot drying study employing tray dryers at various temperature, and a laboratory drum dryer. While low temperature drying is desirable to secure maximum strength, it is not at all practical from a production standpoint. There is a tendency at low temperatures (i.e. 140°F .) to form a thin hard glaze over the surface of the pigment on the trays, preventing uniform drying and slowing down the drying process to a matter of several days - possibly a week or more. With one exception it was deemed advisable to sacrifice some of the strength and dry at elevated temperature, at which no such "glazing" effect was apparent. The exception was RE-557-D, the Duol lake, which weakened 20% at 180°F ., and 10% at 160°F .. A standard temp. of 140°F . has been specified for this lake. All others were satisfactorily dried at 180°F .

The laboratory drum dryer appeared to give satisfactory results although the higher temperatures involved in some instances had definitely harmful effects on tinctorial properties.

In order to prevent separation of toner and extender, it is necessary to pan out the slurry on trays and dry immediately after making.

EXPERIMENTAL DETAILS

Reference is made to KN-46-13 for a summary of laboratory work on this problem; to DSN 46-17, part I for Semi-works and plant details on reds; and to DSN 46-17, part II for semi-works and plant details on blues, yellows and greens.

Testing of the products was by brushout in casein with clay extensions to give deep and light tints. See TF-52-13.