

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

NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

INDANTHRONE BLUE LAKE BP-258-D GLOSS IN "DUCO"

PERIOD COVERED: September 14, 1953-October 30, 1953

CHARGE: A-I-C-52

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**NEWARK PLANT
CHEMICAL DIVISION - COLORS
FINAL REPORT**

TITLE: Indanthrone Blue Lake BP-258-D Gloss in "Duco".

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A. D. Wojnarowski
SUBMITTED BY: A. D. Wojnarowski

A. A. Brzezolara
APPROVED BY: A. A. Brzezolara

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INTRODUCTION:

Following the approval of our Indanthrone Blue, BP-258-D, as a satisfactory substitute for Harmon's Indo-Blue B-1, F & F actually started using it in production early this year. A few months ago, we were advised by F & F that lacquer enamels made from current BP-258-D were somewhat lower in gloss than those previously made with the Harmon pigment. It was explained that the gloss difference, while noticeable, was still within acceptable limits. However, we were requested to bring BP-258-D back into line with respect to gloss.

BP-258-D is a vat dye lake prepared by paste or slurry mixing the vat dye, Orchem's "Lithosol" Blue, and alumina hydrate extender which is purchased as a dry powder. The ratio of the dye to alumina hydrate is approximately 40 to 60.

SUMMARY AND CONCLUSIONS:

The conclusion drawn from the results of the investigation of the factor or factors responsible for poor gloss performance of BP-258-D shipments in "Duco" may be summarized as follows:

1. Standard BP-258-D (S.D. 808) was found to be slightly inferior in gloss to Harmon's Indo Blue B-1 (C#55451). Incidentally, the rosinated pigment, BP-242-D, gave superior gloss to both BP-258-D and the competitive.
2. Current plant production of BP-258-D was found to be inferior in gloss to standard, thereby confirming F & F's contention.
3. Inferiority of plant production with respect to gloss in "Duco" was traced to the quality of the alumina hydrate (type K - purchased from B.M. Spencer).
4. Evaluation of types K, 50 and 60 alumina hydrate supplied by B.M. Spencer, but manufactured by Westvaco Chemical, showed type 50 to give gloss equal to standard BP-258-D.
5. Preparation of BP-258-D using freshly precipitated alumina hydrate (SF-12) slurry gave gloss in "Duco" superior to both BP-258-D standard and Harmon's Indo Blue B-1.
6. Freshly precipitated alumina hydrate in BP-258-D showed no advantage in gloss in air dried Syntex 55. On baking, it showed slightly better gloss than use of purchased dry hydrate.

DISCUSSION:

As a preliminary investigation of the cause of the decrease in gloss of BP-258-D shipments in "Duco", work was undertaken to

investigate what effect, if any, the amount of alumina hydrate incorporated in the pigment had on the gloss of the finished product. Samples were prepared varying in the ratio content of pigment to alumina hydrate. The results showed that gloss in lacquer decreased with increase in alumina hydrate. Subsequent investigations of plant batches revealed that the moisture content of the plant lots ran higher than that of the standard. On careful drying of the plant samples, the moisture content was brought down to the level of the standard. However, the redried plant lots on routine testing (two-roll lacquer dispersions) showed no improvement in gloss.

Following that, attention was focused on how different types of alumina hydrate affect gloss. An experiment was devised to test this effect using several types of alumina hydrate currently produced by Westvaco and sold by B. M. Spencer and Co. The present line of Westvaco includes three different types of alumina hydrate, namely: Alumina Hydrate K, Alumina Hydrate 50 and Alumina Hydrate 60.

Of the three types manufactured, Alumina Hydrate 50 (sulfate base superseding type K) showed on evaluation gloss characteristics equal to that of the standard. The cause for the decrease in gloss was therefore traced to the type of alumina hydrate used. In order to substantiate this observation, small quantities of alumina hydrate were freshly prepared following the procedure of SF-12 and SF-23. The results were highly gratifying. Gloss was shown to be by far superior to that of the competitive sample and our present standard. It surpassed the latter by 20 arbitrary points on glossmeter readings.

Substitution of barium rosinate for alumina hydrate also improves the gloss properties of the product.

Four other effects with the freshly prepared alumina hydrate were noted.

1. The sulfate base and phosphate base formulations of fresh alumina had about equal bearing on the resulting gloss property.

2. Variation in the content of soda ash of the SF-12 procedure was not noticed on the gloss in the finished product.

3. Methods of washing and the manner of addition of the separate ingredients have apparently no effect on the gloss of the product.

4. In the process of drying the slurry, the temperature, and not the length of time, determine the moisture content. It was found that drying at 140°F or 180°F gave about equal results in gloss characteristics of the finished product. On the other hand, drying

at 200°F diminishes gloss and decreases the yield.

As mentioned previously the testing for improvement in gloss is performed by following a method known as "two roll lacquer dispersions" (TF-1009-1) recently supplied us by F & F.

The gloss of the product was also evaluated by subjecting it to dispersion in Syntex 55 and air drying. The results indicated no difference in gloss properties. Dispersion in Syntex 26 followed by baking indicated slight superiority of the competitive sample in gloss.

REFERENCES:

For particular details one may refer to NB 1480. Exp. 1-10.

Results of previous work are also to be found in KN-50-37.

SUMMARY OF EXPERIMENTAL DETAILS

Ratio of Dye/Alumina Hydrate		37/63	37/63	
Description	Laboratory control using Alumina Hydrate type K		Typical plant Lot-BP-258-D(E) Lot 56356D	BP Lo Dr co
Gloss Reading		63	54	

37/63	37/63	37/63	37/63	
Laboratory control using Alumina Hydrate Type K N-385 (Comp. 10/2/53) & N-689BCS	Lab. control using Alumina Hydrate Type 50 N-385 (Lot 528) & N-689	Lab. pigment using prepared Al. Hydrate SP-12 Std. 30 15	Freshly prepared Al. Hydrate pH varied <u>alum sulfate</u> 30 Na ₂ CO ₃ 12	BP SD St (A)
56	75	87	85	

Detailed reference may be found in NB 1480 Exp. 1-9

GLOSSARY:

Alumina Hydrate K - Obsolete type - sulfate base. Manufactured by Westvaco. B. M. Spencer supplier. Currently employed in BP-258-D procedure.

Alumina Hydrate 50 - Product superseding type K. Sulfate base. manufactured by Westvaco. B. M. Spencer distributor. Product proposed for incorporation in BP-258-D formula.

Alumina Hydrate 60 - Currently produced. Phosphate base. Manufactured by Westvaco. Distributed by B. M. Spencer. Not employed in BP-258-D formulation.