

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

NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

CALCIUM LITHOL RED LAKE FOR RUBBER, RL-408-D
DEVELOPMENT AND STANDARDIZATION OF ECONOMY PROCESS.

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DEVELOPMENT AND STANDARDIZATION OF ECONOMY PROCESS.

MARCH 1946 - AUGUST 1947

SUBMITTED BY: E. J. Hess

E. J. Hess

DATE SUBMITTED: 12/23/48

APPROVED BY: J. O. Morrison

J. O. Morrison

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INTRODUCTION:

Development work on standardization of an economy dry mix process for the calcium lithol red lake for rubber, RL-408-D, was started in March, 1946. Failure to obtain a satisfactory product made it necessary to devise another means of obtaining the desired saving. Sales finally authorized standardization at a lower strength (decreased toner) level to solve this problem.

SUMMARY & CONCLUSIONS:

Preliminary investigation in the laboratory indicated that the following blend would give a satisfactory match to the RL-408-D standard, lot 4505, at a saving of about two cents per pound:

RT-425-D (K-2058 type)	52.75%
RT-364-D (K-2057 type)	21.00%
RT-432-D	4.25%
Blanc Fixe	22.00%

Before laboratory work was complete, RT-364-D was eliminated from the blend because of the possible patent infringement complications resulting from the use of this naphthenated toner in mixes with rosinated products.

Attempts to set up a dry mix RL-408-D from RT-425-D, RT-432-D and blanc fixe on a plant scale were unsuccessful. The following blends were made and rejected for the reasons indicated:

<u>Lot</u>	<u>Rubber test vs Std. lot 4505</u>	<u>Reason for Rejection as Std.</u>
48428	6% str. - vvs bl.	too strong
49089	OK - yellow	Lot 49089 based on 48428 therefor probably non-uniform.

Subsequently, on the basis of the Sales' decision to lower the toner content of RL-408-D to give a product 10% weaker than lot 4505, lot 49089 was reduced with blanc fixe to the desired strength. However, before tests were made on this material (designated lot 49628), it was decided that much of the previous difficulty with the dry mix process was due to the unsatisfactory resistance of the components to the rubber curing process. Work on the dry mix procedure was abandoned, therefore, and restandardization in the plant of the normal K-1611 type process at a lower strength level was started.

Standardization of a modified K-1611 product at the desired strength level was accomplished by increasing the blanc fixe extender by about 56%.

A new RL-408-D standard, lot 81660, replacing lot 4505, was set up and a new RL-408-D standard formula, K-2509, replacing K-1611, was issued in August, 1957.

The Production Division assumed supervision of manufacture of RL-408-D in August, 1947.

DISCUSSION:

Preliminary work in the laboratory during late 1944 indicated that a satisfactory match to the RL-408-D standard, lot 4505, could be obtained with the following blend of economy lithols and "Duols":

RT-425-D (K-2058 type)	52.75%
RT-364-D (K-2057 type)	21.00%
RT-432-D	4.25%
Blanc Fixe	22.00%

A saving of approximately two cents per pound in mill cost would result from the use of this process.

Before large scale work was started it was decided that a possible patent infringement was involved in mixing of pigments containing naphthenic acid (RT-364-D) and rosin (RT-425-D and RT-432-D).

This problem was inactive in the Research Laboratory during 1945 although a satisfactory product using RT-425-D and RT-432-D and eliminating RT-364-D from the mix was developed in the meanwhile by Sales Service.

An apparently satisfactory blend consisting of 76.6% RT-425-D, 1.4% RT-432-D and 22.0% Blanc Fixe was issued as K-2388 in August, 1946.

Meanwhile, a proposed RL-408-D standard, lot 48428, based on this formula, was submitted for evaluation. Lot 48428 was apparently a satisfactory match to lot 4505 (6% str.- vvs blue in rubber) except for a slight strength advantage.

Because of the extra strength it was decided to dilute lot 48428 with about 4% Blanc Fixe to obtain a product closer to lot 4505. This blend, lot 49089, was made and a process based on the new blend was issued in October, 1946. The process, K-2397, had the following composition:

RT-425-D (K-2058 type)	73.60%
RT-432-D	1.35%
Blanc Fixe	25.05%

Lot 49089, by rubout test, was equal in strength but yellow in tint versus the standard, lot 4505. At the time it was thought that this change from the vvs blue tint result obtained with the original material, lot 48428, compared with the yellow tint of lot 49089 was due to some non-uniformity of the blend.

Meanwhile, Sales had decided to lower the tinting strength of RL-408-D by 10% in order to effect a further saving of about three cents per pound in mill cost. Accordingly, lot 49089 was reduced further with blanc fixe to obtain the desired strength. This blend, lot 49628, was never evaluated as a proposed standard; however, as further study by the Sales Service laboratory indicated that the tint change previously noted was due to inferior resistance of the dry mix product to the rubber curing process rather than to non-uniformity. There

was some question at the time as to whether the use of a new electric curing press rather than the regular steam press was responsible for the difficulty but it was finally decided to restandardize on the basis of a K-1611 type product at a lower strength level.

Accordingly, in May, 1947, plant manufacture was started using a modified K-1611 procedure. The principal change was an increase in the blanc fixe extender amount from 28% to 33%. A series of eight batches made on this formula averaged about 8% strong and slightly blue in tint by rubber test versus an adjusted standard (lot 4505 adjusted downward 10% in strength).

Five of these batches plus sufficient blanc fixe to give the desired strength in rubber were blended to give the proposed standard, lot 81660, which was submitted for evaluation in June, 1947. A comparison of lot 81660 versus the RL-408-D standard, lot 4505, follows:

Varnish dryer rubout:

Lot 81660 vs lot 4505: light, yellow - weak (115=100)- vs yellow.
Light Stability: MT:equal Tint: vs superior.

Rubber Test:

Lot 81660 vs lot 4505: weak (110=100) - vs blue. Migration: O.K.

Lot 81660 was accepted by the Sales Division as the RL-408-D standard in August, 1947, and a new standard formula, K-2509, (now designated RL-408-D(A)), was issued. K-2509 differs from the previous standard, K-1611, as follows:

1. The caustic soda, sodium nitrite and hydrochloric acid weights were adjusted to conform with other lithol red toner economy processes.
2. The extender amount was increased approximately 56% to give a strength decrease of 10%. The blanc fixe content of the color was thereby increased from 28% to 37%.

The Production Division accepted supervision of RL-408-D manufacture in August, 1947.

PATENT SITUATION:

There is no patent restriction in the manufacture of RL-408-D. It is not believed that this study has resulted in any patentable development.

GLOSSARY:

RL-408-D: An extension of a calcium lithol toner (Tobias Acid → Beta Naphthol) containing 37% blanc fixe.

RT-364-D (K-2057 type): A barium lithol toner (Tobias Acid → Beta Naphthol) containing about 8% barium naphthenate, 5% barium rosinate and 5% blanc fixe.

RT-425-D (K-2058 type): A calcium lithol toner (Tobias Acid → Beta Naphthol) containing about 16% of calcium rosinate.

RT-432-D: A calcium "Duol" toner (Tobias Acid → Beta Naphthol) containing about 37% of calcium rosinate.

Tobias Acid: Beta naphthylamine-1-sulfonic acid.

Naphthenic Acid: A petroleum by product - acid number 225; unsaponifiable matter - 10%.

EXPERIMENTAL DETAILS: DSN-48-37.