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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

ALKALI RESISTANT RED PIGMENT RE-543-D
SEMI-WORKS DEVELOPMENT & STANDARDIZATION

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Final Report

ALKALI RESISTANT RED PIGMENT RE-543-D

SEMI-WORKS DEVELOPMENT & STANDARDIZATION

J. O. Morrison
12/28/48

AUGUST 1943 - JUNE 1944.

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INTRODUCTION:

Competitive developments in the alkali resistant linoleum lake field had seriously affected the sale of our rather alkali sensitive red lakes, RE-389-D and RL-451-D at Congoleum Nairn.

The development of RE-543-D and its laboratory counterpart, K-1888, was the result of early work designed to meet this competition. The laboratory studies have been reported in KN-42-29 and Notebooks 933 and 952.

SUMMARY & CONCLUSIONS:

The laboratory product, K-1888, was set up as a dry blend of two red lakes (K-1607 and K-1872) and was designed to match Nairn's #21 Red (C #468370). Both of these lakes were approximately 8% extensions on whitening of two slightly different PNOA - NBS couplings.

Semi-Works trial batches on the K-1607 and K-1872 processes gave the following results versus the corresponding laboratory standards:

RT-1607D, lot 6632 vs K-1607: lt., yellow - OK - blue.
RT-1872-D, " 6631 vs K-1872; lt., intense - OK - yel., intense.

As a blend of the above material was much too light to match K-1888, further manufacture was necessary to supply sampling material. A satisfactory product was made with a modified K-1872 procedure correcting an error involving coupling alkalinity in the original process and using a para soap variable.

A blend of two batches made on the modified K-1872 process was set up as the semi-works RE-543-D standard, lot 41867. A comparison of the semi-works and laboratory standards follows:

Linoleum Composition.

Lot 41867 vs K-1888: vs dark - vvs strong - vs yel.

Varnish Dryer Rubout

Lot 41867 vs K-1888: very dark - 7% strong - s.yel., intense.

The RE-543-D standard was obsoleted in June, 1944, because of the customer's request for the stronger lake, RM-545-D.

DISCUSSION:

The laboratory match to Nairn's #21 Red, designated K-1888, was based on a blend of 35% K-1607 and 65% K-1872. Results versus the competitive product follows:

Linoleum Composition Test (TF-88-13)

K-1888 vs C-46837: vs intense, trace yel.- OK - trace blue, vvs intense.

Varnish Dryer Rubout Test

K-1888 vs C-46837: light - vs blue - OK - vs blue

Semi-works study of the processes was started in August, 1943, upon receipt of a trial order from Nairn. First manufacture in the semi-works was based on modifications of the laboratory procedures, K-1607 and K-1872, designed to fit plant equipment limitations. The principal change in both processes was the use of the RT-539-D procedure for dissolving the NBS.

Both semi-works batches were on the light side of their respective laboratory standards. Difficulty with control of coupling pH was probably primarily responsible for the tinctorial variation. A table of the results obtained follows:

<u>Type Process</u>	<u>Normal pH</u>	<u>Actual pH</u>	<u>Rubout Results vs Lab.Std.</u>
1607	6.8-7.2	5.7	lt.,yellow - OK - blue
1872	9.2-9.6	7.1	lt.,intense- OK - yel.,intense

It was subsequently found that there was a typographical error in the caustic soda amount in the original K-1872 formula and a second semi-works batch was made correcting the error. A normal test was obtained in this case and the batch finished up slightly dark in masstone, equal in strength, and yellow in tint by varnish dryer rubout versus K-1872. It was also a fairly close match, by rubout, to the Nairn standard, C-46837 (vs dark - 5% strong - s.yel.).

A series of two batches were then made studying the effect of increased and decreased amounts of para soap in the revised K-1872 process. A cold method of dissolving the NBS (similar to the original laboratory procedure) was also used in the decreased para soap batch.

A 50% cut in para soap (together with the NBS solution variable) gave the following results:

Varnish Dryer Rubout

Lot 6649 vs K-1872: dk.,blue - weak - yellow.
 " " vs C-46837: v.dk., blue, dull - weak - yellow
 " " vs K-1888: v.dk., blue, dull - vs weak - yellow

Linoleum Composition Test

Lot 6649 vs K-1888: weak - yellow

Doubling the para soap in the K-1872 semi-works process gave the following:

Lot 6651 vs K-1872: lt.,intense - s.strong - s.blue, intense.
 " " vs C-46837: s.lt., s.dull - strong - blue, s.intense.
 " " vs K-1888: dk., blue - strong - s.blue, s.intense.

Linoleum Composition Test

Lot 6651 vs K-1888: strong - blue

A blend of equal parts of these two batches was set up in February, 1944, as the RE-543-D standard, lot 41867.

An RE-543-D standard formula, K-2122, based on semi-works formula, lot 6651, was issued in February, 1945, for costing purposes but the color had been obsoleted previously (June, 1944) (superseded by RM-545-D).

PATENT SITUATION

There is no patent restriction on the manufacture of this color. It is not believed that this study has resulted in any patentable developments.

GLOSSARY:

K-1607

An 8% extension on whitening of a PNOA-NBS coupling.
The light blue component of K-1888.

K-1872

An 8.8% extension on whitening of a PNOA - NBS coupling.
The dark yellow component of K-1888.

K-1888

A blend of 35% K-1607 and 65% K-1872.

RE-543-D

An 8.8% extension of a PNOA - NBS toner on whitening.

RM-545-D

A 25% extension of an RE-539-D type toner. (PNOA → NBS) on whitening.

PNOA

Para nitro ortho anisidine.

NBS

"Naphthanil" BS; the meta-nitranilide of beta hydroxy naphthoic acid.

RE-389-D

A 12.5% lake of Pigment Scarlet dye (anthranilic → R Salt) on alumina hydrate and barytes.

RL-451-D

An 11% extension on barytes of RE-329-D (a PMTA toner of Rhodamine 6GDN).

PMTA: Phospho molybdo tungstic acid complex.

EXPERIMENTAL DETAILS:

DSN-48-31.