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

NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Progress Report

Use of Non-precipitating Sodium Rosinate in RT-488-D, RT-242-D, RT-443-D, RE-526-D, and YP-440-D

Period Covered: November, 1941 - February, 1942

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SUBMITTED BY: E. J. Hess E. J. Hess DATE SUBMITTED: 3-17-44

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INTRODUCTION:

The use of Sodium rosinate in many of our important organic colors has introduced a problem in large scale production which has caused considerable difficulty during the past few years.

The trouble involves the precipitation due to over-cooling of rosinate solutions as ordinarily made during the process of transfer from solution tank to strike vat. The precipitation usually occurs in the hose line and continues until the hose has been heated to a sufficiently high temperature (over 120°F) to prevent this undesirable effect.

The presence of free rosin or sodium rosinate results in a definite fire hazard as well as a probable source of variation in quality.

The situation has been remedied in the plant by re-dissolving or returning to the solution tank the first ten gallons of rosin solution running through the hose. This has worked satisfactorily to prevent fires but it represents an increase in labor cost.

During the course of a general study on the preparation of rosin solutions it was discovered in the laboratory that if the proper conditions of alkalinity and solution concentration were used, a sodium rosinate solution could be prepared which did not precipitate even on the addition of ice. Considerable precipitation would result if an orthodox rosin solution was treated in a similar manner.

A comparison of the ratios of rosin to caustic soda to gallons of cold water used in preparing plant scale rosin solutions by the orthodox and proposed new method follows:

New method: 8.25# rosin - 1# NaOH 100% - 8-1/4 gal.water
Std. method: 8.25# " - 1.65# NaOH 100% - 14 gal.water

The following report covers the use of the new type rosin solution in various rosinated organic toners and its effect on tinctorial properties. The colors in which this change has been tried are listed below:

RT-242-D: 1 plant batch
RT-443-D: 1 plant batch
RT-488-D: 3 Semi Works batches
RE-526-D: 2 plant batches
YP-440-D: 1 Semi Works batch

SUMMARY & CONCLUSIONS:

All of this study on the various rosinated colors was conducted during the latter part of 1941 and the early part of 1942.

The only variation from the normal procedure involved in the preparation of this type rosinate is the necessity for carefully checking the solution during the boiling to insure the maintenance of a very slight test for alkali on Clayton Yellow paper. This control test insures complete saponification of the rosin which is necessary for good results (the clarity of the solution obtained is no indication of the completeness of saponification as free rosin is soluble in sodium rosinate solution). Care must be taken in adjusting alkalinity at this point because of the fact that if too much alkali is used the non-precipitating feature of this solution disappears.

The plant batch of RT-242-D (lot 91539) was made to check the standard K-9955 except for the use of the special rosinate solution. The product ground out light in masstone, 6% strong and slightly blue and clean versus the standard. Indications are that this material is somewhat lighter and weaker than is normally obtained with this formula. The theory was advanced at this time that a probable reason for the lighter masstone obtained was the lowering of development alkalinity resulting from the fact that the caustic soda used in the sodium rosinate solution was cut from 30 pounds to 18-1/2 pounds per mol batch.

Although the validity of this theory was not tested in RT-242-D (where it would probably hold) it was decided to eliminate this uncontrolled variable in the next color tried by making up the alkali deficiency by adding extra alkali after the rosinate addition.

Consequently, in the trial of the special rosin in the RT-443-D, K-9507 formula enough extra alkali was added to bring the total caustic soda amount up to the standard figure. In spite of this a comparison of the trial batch (lot 91177) with a control showed that the light masstone effect still persisted. Strength was not affected in this case and both batches were dark, equal in strength and yellow versus the RT-443-D standard.

This same effect resulted in two plant batches (lots 90901,90130) of the extended RT-443-D product, RE-526-D. Light masstone material was obtained in both cases.

In two Semi Works batches of RT-488-D (K-1436 formula) the special rosinate gave the expected light masstone effect. Strength was practically unaffected but tints were somewhat yellower than the control samples.

In the case of RT-488-D, however, when the alkali deficiency resulting from the use of the special rosinate solution was corrected a check to the normal control batch in masstone and tint was secured.

A trial of the special rosinate in the YP-440-D, K-9590 formula gave a light masstone, very slightly less transparent result against a control batch. This is the usual effect of an alkali decrease in this formula and it is probable that normal results would be obtained if the alkali amount was adjusted to the standard figure subsequent to the addition of the rosinate.

The above results show that this non-precipitating rosinate solution could be used in the plant for most colors where rosin is a component but it was questionable as to whether the supervisory time necessary to carefully control the alkalinity of the solution during the boiling cycle was available at the time. Consequently, it was decided to continue with the ordinary type solutions, "re-dissolving" or "recirculating" as necessary to eliminate the fire hazard.

Reconsideration of this decision may be desirable at the present time because of the availability of more supervision and on the basis of the following advantages:

1. Non-precipitating feature makes it unnecessary to recirculate or redissolve the rosinate solution. This is desirable not only from the slight saving in time but also from the safety angle connected with the transporting of 5-10 gallons of hot alkaline rosinate solution up one or two flights of stairs to the dissolving vat or to a steam line.

2. The decrease in volume (about 50%) which probably results in a small steam savings.

3. Possibility of more rapid cooling, when necessary, by the use of ice or cold water. Under present conditions about the only sure way of coolingwithout the danger of precipitation is to stir and this is only possible down to a minimum temperature of 120-130°F.

EXPERIMENTAL DETAILS:

RT-242-D	NB 637 page 132	RT-488-D	DSN-44-3
RT-443-D	DSN-43-58	RE-526-D	DSN-43-31
		YP-440-D	DSN-43-49