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PIGMENT COLOR RESEARCH REPORT

LIGHT CHROME YELLOW - HIGH RATE PROCESS Y-434-D

Period Covered JUNE - AUGUST 1969

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NEWARK PLANT

PIGMENT COLOR RESEARCH REPORT

SUBJECT: LIGHT CHROME YELLOW - HIGH RATE PROCESS Y-434-D

PERIOD COVERED: JUNE - AUGUST 1969

SUBMITTED BY: J. F. HIGGINS *JFH* Date Submitted: June 3, 1970APPROVED BY: E. F. KLENKE, JR. *EFK* Date Released: June 25, 1970

ABSTRACT: A high spot lab study of Y-434-D at 5100 lbs./hour concentrations was undertaken to determine the practicality of increased concentration processes for ream-out purposes. High speed jets were used in all cases. Although equal strength was obtained, masstones were very dark green and dull and had poor lightfastness. Normal variables would not correct the situation. Electron micrographs indicated a wider particle size distribution, i.e., more smaller particles than in standard. Coating at low salt concentrations gave similar results, indicating the problem lay in the precipitation step. Study was discontinued because of the decision to proceed on basic data for a new continuous line.

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INTRODUCTION

One of the alternates to expanding inorganic yellow production to meet the forecasts for the early 1970s was to ream-out the existing 12 Bldg. facility. This approach could assume an increase in volume throughput of the present unit, or assume the same or nearly the same volume throughput with increased solids content; that is, an increase in concentration of the components. Recognizing that this approach offered difficulties based on past experience, it was decided to utilize the high speed jet technology from molybdate orange work to high spot the concentration approach, in the hope that improved mixing would overcome some of the problems experienced in the past when increased concentrations were used. Accordingly, Y-434-D, a lead excess type light yellow, was selected for initial lab study, at a concentration equivalent to an increase in rate of 50% - from 3400#/hr. to 5100#/hr., utilizing 109 mil jets (the same speed used for high ratio molybdate orange).

SUMMARY AND CONCLUSIONS

- 1) Y-434-D types of equal strength but dark green dull masstones of poor lightfastness were obtained.
- 2) High speed (109 mil) jets were used in all experiments. Split strikes, similar to molybdate orange technology were also employed.
- 3) Variables which should have given lighter, redder masstones, such as increased fluoride ion, increased development time, higher strike pH, higher strike temperature, and increased alum, resulted in no significant change. Several combinations of these variables were used.
- 4) The same results were obtained using washed presscake before the alum, silica and "L" liquor treatments, indicating that the higher salt concentrations probably were not involved.
- 5) While x-ray diffraction patterns appeared normal, electron micrographs indicated a wider particle size distribution. Instead of essentially all particles being uniform in size and shape, there were some smaller ones. This fraction of smaller particles could account for the greener masstone and especially the poorer lightfastness. This indicated the problem to be in the precipitation part of the process.
- 6) The study was not pursued because of the decision to proceed with another continuous line.

DISCUSSION

The indications are that the main problem was in the precipitation itself, possibly because of too many nuclei. Several additional experiments are indicated, namely, use of lower jet velocities, variation of concentration and jet speeds to determine at what concentration and jet speeds the optimum effects are obtained.

Other experiments which could prove informative are the use of sodium chloride instead of fluoride, which can affect crystal habit, and also higher development and precipitation temperatures.

While these results are only for the light yellow type, examination of the higher sales volume Y-469-D Medium Yellow would be in order.

The experiments covered in this report are 1922K-1 through K-6.

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