

Key-10
S. J. Gorman/L. F. Andrews, Wilm.
R. H. Zabel, Wilm.
R. J. Lombardo, Wilm.
W. F. Spengeman, Chestnut Run
J. A. Lamiet, Chestnut Run
W. S. Struve/A. A. Brizzolara, Nwk.
W. J. McClure/R. A. Hageman, Newark
H. Arnoul, Newark
J. Jackson, Newark *

Newark, New Jersey
May 15, 1968

P. D. GRAHAM
Pigments - Wilmington

CHECK LIST

"KROLOR" ORANGE - KO-789-D

I. COMPOSITION

KO-789-D is a new shade of "Krolor" based on the treatment of YE-734-D with approximately 22% $\text{SiO}_2/\text{Al}_2\text{O}_3$ and 1% Emory 3554D/Igepal C0630. This type product is prepared from dispersions made with the plant colloid mill and homogenizer.

Development of this type material was requested by Sales (RHZ - WSS "Krolor" Orange Y - YE-789-D, 5/4/67) on the basis of SW lots 00200 and 01000 (the latter of which was homogenized). (See NC-67-11)

Sales requested the standardization of a product equal to lot 00200 (colloid-milled) and ultimately the production of material like SW-01000.

We have on hand 1759 lbs. of lot 52134 and 2547 lbs. of lot 53079 which we would consider a more reasonable standard process.

II. PROPERTIES - PLASTICS

Lots 52134 and 53079 have been evaluated by Research and Chestnut Run for use in the plastics trade. Both are superior to SW-00200 set up in the original request (NC-67-11) (See also NC-67-34). These products are lighter and yellower in masstone and stronger and yellower in tint than YE-777-D (SD-86729) and are superior in thermal stability and abrasion resistance.

NC-67-34 covers the most recent evaluations of KO-789-D production and shows a slight superiority of the homogenized lots versus simple colloid-milled materials.

May 15, 1968

Lot KO-789-D, 01000 (homogenized SW lot) was included in an evaluation in "Dalvor" fluoro carbon resin (G-67-349-8/67) and found to be superior to conventional oranges in heat resistance and better in adhesion than calcium Staybelite treated lots KO-786-D and KO-787-D. KO-789-D, 52134, has been exposed in vinyl in P-68808 (5/3/68). KO-789-D lots have been found to show a very high level of alkali resistance in asbestos tile (NC-67-34).

Paint Characteristics

Little paint work has been done on KO-789-D types such as lot 52134 or 53079 at Chestnut Run. Research studies have shown these lots to be on the defensive in gloss versus conventional molybdates such as YE-421-D or YE-637-D in gloss. Exterior durability and chemical resistance of the original SW lot 01000 is excellent (see Exposure Series #67417) being better than YE-637 and more intense. Hiding power is lower as is typical of all "Krolors"; tinting strength by Research tests is proportional to toner contents. Typical gloss level data are given in Table I.

Samples of this type material have been submitted to Bennett (Lot 52097, colloid-milled and 90098-1, homogenized). No report on these has been received by the writer.

Research has studied three approaches to improvement in gloss levels.

a. Treatment with calcium Staybelite - as shown by Semi-Works lot 00278. Research findings on this lot are summarized in my letter (J.J. - J.A.L., YE-789-D, 00278, 2/19/67) and an evaluation of the lot was requested since softness of films seemed to be a problem. Chestnut Run has initiated this study as NC-67-36.

A verbal report on 5/15/68 from E. L. Cairns summarizes Chestnut Run's findings as follows:

Strength	40% vs. YE-637
Pigment Utility	1-1/2 lbs. = 1 lb. YE-637
Drying	Inhibits cure in baked systems (30J, acrylic) Moisture sensitive and solvent sensitive as a result.
	Air dry alkyd - OK - Cure
	Chemical Resistance - OK
	Weatherometer approximately equal to YE-637-D.
	Gloss equal to or v sl ws vs. YE-637-D.

May 15, 1968

b. Treatment with Zinc Staybelite

Since Research found the calcium Staybelite to inhibit cure (this has since been checked by Chestnut Run) a study of zinc Staybelite-treated lots was made. These were found to behave normally in paint giving good gloss levels and plastic results. We do not have patent protection on this approach as yet, and have not manufactured any calcium or zinc-treated lots in the plant.

c. High Speed Pulverization or "Vortac" Milling of Unextended Toner

Studies have indicated that high speed pulverization or "Vortac" milling will yield higher gloss levels at a small sacrifice in plastics stability. Typical data are as follows:

<u>System - 30J Sand Grind</u>		<u>20° Gloss</u> 60-64	<u>Film Hardness</u> Normal
WR 67-828	YE-637-D Std.		
	52134 Low speed pulverized	31	Normal
	52134 High speed pulverized	50	Normal

III. TOXICITY

Possibly lower than YE-777-D and conventional molybdate orange because of higher amount of silica coating.

IV. PATENT POSITION

The basic patents covering "Krolor" type pigments are applicable. These include U.S. 2,885,366 and 3,370,971 as well as patent applications Serial No. 681,323.

SUBMITTED BY:

Julius Jackson
JULIUS JACKSON
RESEARCH ASSOCIATE

APPROVED BY:

W. S. Struve
W. S. STRUVE
LABORATORY DIRECTOR

dc

TABLE I

<u>WR</u>	<u>System</u>	<u>Sample</u>	<u>Gloss Levels</u>	
			<u>20° Gloss</u>	<u>Film Hardness</u>
67-828	30J sand grind	YE-637-D	60-64	OK
		52134 (reg. speed pulv.)	31	OK
		52134 (high speed pulvs.)	50	OK
68-23	30J sand grind	YE-637-D	62	OK
		52134	40	OK
		90% 52134/10% Ca Staybelite dry mix	64	S1 soft
68-101	30J sand grind	YE-637-D	63	OK
		52134	47	OK
		94% 52134/6% Ca Staybelite dry mix	55	OK

TABLE II
EXISTING STOCKS

<u>Lot No.</u>	<u>Lbs. on Hand</u>	<u>Type Dispersion</u>
52097*	1971	Colloid mill
52134	1759	Homogenized
52225*	1863	Colloid and question- able homogenization
52814*	2451	Colloid and question- able homogenization
53079	2547	Colloid and homogenized
90098-1 (mix of the above)*	1750	
90294-1 (pulverization)*	521	Part of 90098-1 re- pulverized
90293-1 (Studies)*	586	Part of 90098-1 re- pulverized

*All are probably within normal shipping limits of 52134 or 53079 for use in plastics.