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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

REACTIVITY OF CHROME YELLOWS AND MOLYBDATE ORANGES

Period Covered: 1946 - 1949

Charge: 1101-11-3

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NEWARK PLANT

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FINAL REPORT

Title: Reactivity of Chrome Yellows and Molybdate Oranges

Period Covered: 1946 - 1949

Charge: 1101-11-3

SUBMITTED BY: JULIUS JACKSON Julius Jackson DATE SUBMITTED: MAY 12, 1950

APPROVED BY: B. H. PERKINS B H Perkins 6/8/50 DATE ISSUED: JUNE 6, 1950

INTRODUCTION

A study was started in 1946 to determine the significance of accelerated tests for reactivity of chrome yellows, in terms of the behavior of the inks on prolonged shelf storage (see KN-47-3).

This investigation was the outgrowth of findings that certain continuously manufactured products were rated as unacceptable in reactivity (see memo V. J. Mohan to W. F. Spengeman 10/30/46), when evaluated by the test then being used. This test consisted of grinding the pigment at 75% pigmentation in a vehicle consisting of 80% #1 Regular and 20% #5 Regular Varnish. The pigments were considered satisfactory when ground in less reactive vehicles.

This matter was reviewed in 1946 with our ink consultant Dr. Carman, and the interested parties decided that since chrome yellows are usually used in transparent vehicles, testing in regular varnishes was too severe. In KN-47-3 the writer summarized these findings, as well as data on the same pigments ground at 75% pigmentation in two vehicles, namely #2 Transparent and #2 Regular Lithographic Varnish (the latter being considered a severe test) and decided that all products would probably be satisfactory to the ink trade.

It was also suggested in KN-47-3 that the Sales Service group undertake a program of comparing accelerated reactivity tests with shelf storage data. Accordingly, ink grinds were made by that organization at three month intervals for one year, but complete reports have never been made on their findings.

The inks prepared in this investigation have now been aged at room temperatures for 27 - 39 months. This report deals with the results of examination of the inks by the writer during the month of February 1950.

SUMMARY AND CONCLUSIONS

Examination of various continuously manufactured chrome yellows and molybdate orange inks show that these products, ground in #2 Transparent Litho Varnish and allowed to stand for periods up to three years, show no excessive reactivity. The use of regular varnish for such tests is not recommended. Good correlation between accelerated tests and shelf storage tests was observed.

DISCUSSION

The writer has examined the inks prepared in the course of Sales Service investigation initiated in 1946 for evidence of reactivity on shelf storage and finds that those ground in #2 Regular Varnish and stored for two years or more are all heavy or livered while those ground in #2 Transparent Litho Varnish are all probably still useable. Cross comparisons of old batch standards, with the continuously manufactured products support the findings of the accelerated tests in the main.

No excessive reactivity problem was evidenced by any of these continuously manufactured products as evaluated by the shelf storage grinds in #2 Transparent Litho Varnish. Unless stipulated by a specific customer requirement, the use of #2 Transparent Varnish apparently gives a more realistic test than does #2 Regular Varnish. These conclusions are supported by the relative absence of reactivity complaints in litho varnish against our presently continuously manufactured products. Specific vehicle reactivity problems are, of course, omitted from these discussions.

Tabulated findings of these data follow:

COMPARISON OF SHELF STORAGE AND ACCELERATED REACTIVITY TESTS

CODE	SAMPLE	ACCELERATED REACTIVITY COMPARISON #2 TRANS.	ACCELERATED REACTIVITY COMPARISON #2 REG.	SHELF STORAGE COMPARISON #2 TRANS.	SHELF STORAGE COMPARISON #2 REG.
MEDIUM YELLOWS					
Y-547-D vs Y-468 -SD - 48278 (Batch STD)					
Lot 8742	#6 Building Pilot Plant Mix	*	worse	better	worse
32682	#6 Building Pilot Plant Batch	sl better	sl worse	sl better	sl worse
8314	Semi Works Continuous Unit	*	sl worse	sl better	sl worse
8780	Semi Works Scale Down of #12 Bldg. Unit	*	sl worse	sl better	sl worse
LIGHT YELLOWS					
K-2200 vs Y-404-D - 48442 (Batch STD)					
Lot 8758	#6 Building Pilot Plant Mix	val worse	sl worse	val worse	sl worse
32412	#6 Building Pilot Plant Batch	val worse	sl worse	val worse	sl worse
8176	Semi Works Continuous Unit (STD)	val worse	sl worse	val worse	sl worse
MOLYBDATE ORANGES					
Y-2254 vs YE-421-D - 48416 Batch (STD)					
Lot 8546	Semi Works Continuous Unit (STD)	*	*	val worse	*

SHELF STORAGE

CHROME YELLOWS GROUND 3:1 #2 REGULAR LITHO VARNISH

	DATE OF GRIND					
	2/46	11/46	2/47	5/47	8/47	11/47
MEDIUM						
Y-469 SD-48278	hvy	hvy	s hvy	hvy	vs hvy	vs hvy
Y-547 8742		liv	v hvy	liv	liv	v hvy
32682			v hvy	liv		s hvy
8314		v hvy	v hvy	liv	v hvy	s hvy
8780		liv		liv	v hvy	hvy
LIGHT YELLOW						
Y-405 48288						
K-2216 32829			liv	v hvy		
8410		liv	liv	liv	v hvy	v hvy
8794		liv	liv	liv	liv	v hvy
Y-404 48442		hvy	hvy	hvy	hvy	
Y-2200 8758			liv	liv		liv
32412		liv	liv	liv	liv	v hvy
8176		liv	v hvy	liv		hvy
MEDIUM ORANGE						
YS-421 48416		liv		liv	liv	liv
Y-2254-8546		liv		liv	liv	liv

SHELF STORAGE

CHROME YELLOWS GROUND 3:1 #2 TRANSPARENT LITHO VARNISH

DATE OF GRIND

	2/46	11/46	2/47	5/47	8/47	11/47
MEDIUM						
Y-468 SD-48278		s hvy [a]	hvy	hvy	s hvy	hvy
Y-547 8742		s hvy	s hvy	s hvy	OK	OK
32682		vs hvy	OK	vs hvy	OK	
8314		OK	OK	OK	OK	OK
8780		vs hvy	OK	OK	OK	OK
LIGHT						
Y-405 48288		vs hvy				
K-2216 32829			s hvy	s hvy		vs hvy
8410		vs hvy	vs hvy	s hvy	vs hvy	OK
8794		vs hvy	vs hvy	vs hvy	s hvy	vs hvy
Y-405 49336				OK	vs hvy	OK
Y-404 48442		vs hvy	vs hvy	OK		OK
Y-2200 8758		vs hvy		s hvy		vs hvy
32412		vs hvy	vs hvy	hvy	s hvy	vs hvy
8176		vs hvy	vs hvy	s hvy	s hvy	OK
MOLYBDATE ORANGE						
YE-421 48416		vs hvy	OK	OK	OK	OK
Y-2254 8546		vs hvy	vs hvy	vs hvy	s hvy	vvs hvy

[a] All readings are on absolute basis dependant upon the writers opinion as to useability of inks as read February 1950.