

Cross Index:

301 Line
Screen Staining of House Paints
Trade Sales - General

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Philadelphia Laboratory
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MEMORANDUM REPORT NO. M-259:

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INSPECTION OF SCREEN STAIN SERIES AT TEST FENCE OF
THE NATIONAL PAINT, VARNISH AND LACQUER ASS'N., INC.

On July 6th Mr. Stuart Graves and the writer visited the offices of Mr. John C. Moore, Director of the Scientific Section of the National Paint, Varnish, and Lacquer Ass'n., Inc. The primary purpose of the trip was to discuss and inspect a screen staining series which had been exposed by Mr. W. Lawall at the association's test fence in Lanham, Maryland.

Discussion:

After briefly discussing house paints in general with Mr. Moore we were conducted on a tour of their exposure fences by Mr. Lawall. The scope of the association's work on screen staining is condensed in a single series of 52 panels which can be broken down as follows:

1. A screen enamel test over bronze and galvanized iron screen using on the frames a lithopone paint, a white commercial "non-staining" paint of unrevealed composition, and a titanium dioxide/lead/zinc linseed oil paint.
 - a. The enamels used included a maleic modified linseed oil resin, a black air-dry alkyd resin, a black oven-baked alkyd resin, a clear phenolic resin, and a clear spar varnish.
2. A test of uncoated screens composed of various materials including bronze, lead-coated iron, monel, plastic "Lumite", alclad, and stainless steel. The frames were painted with the same three paints mentioned above plus a white lead-in-oil paint.

The screens were tacked to frames 2' x 1-1/2' x 1". A 6" wide board was mounted directly beneath the screens to simulate the window sill or clapboards of a house. All exposures were north vertical only and the length of exposure in most cases was two years.

Results & Conclusions:

Detailed results are given in the attached set of tables. Unfortunately, there were several disappointing factors noted on this inspection. Among these was the fact that the data for all panels was given only at nine months and two years. Since most of the panels had started to chalk at 9 months, the significant period of staining between 1 and 9 months was evidently not covered. Also the composition of the paints and enamels were, in general, not revealed so that it was difficult to make any comparison between degree of screen stain versus composition of pigment and vehicle. Results were confused in several places by the use of poorly protected iron nails and by drip from stained panels above. And, finally, it was agreed upon by Mr. Graves and myself that the conditions favoring screen staining in this particular locality was not as severe as is usually encountered. There is the added factor that only new screens were used and the position of exposure was north vertical only.

In general, as far as the screen enamel series was concerned, only one enamel did the job - namely, the black alkyd resin applied to the screen by spray and baked at 250 degrees for one hour. All the other enamels failed between 9 months and 2 years.

As far as the different types of metals are concerned, lead coated iron and monel metal stained in several cases whereas plastic "Lumite", alclad, and stainless steel were relatively free from staining over all paints tested.

The house paint which Mr. Lawall claimed to be free from staining throughout the two year exposure was chalking very heavily compared with the other titanium linseed oil paint. We are of the opinion that this is an alkyd vehicle heavily loaded with free chalking titanium dioxide since several of the panels were already flaking and eroding at two years north exposure. The white lead paints were relatively free from staining but this is not surprising since the panels were out only 1-1/2 years using new metal screens. Our own exposure results show that white lead in oil is usually slower to stain than a titanium-linseed oil paint but passes it in the degree of staining somewhere after 18 months.

During the latter part of the day we were given an interesting resume of work done on a method for testing fire retardant paints by Dr. Westlake. The work will probably be published in the near future.

PHILADELPHIA LABORATORY

R. M. Kirkpatrick

R. M. KIRKPATRICK

RMK:pp
Att.

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TABLE #1 - BRONZE SCREENS

Screen Coating	Panel	Frame Paint	Stain		Panel	Frame Paint	Stain		Panel	Frame Paint	9
			9 Mo.	2 Years			9 Mo.	2 Years			
None	1A	TiO ₂ , Pb, Zn	Sl.	None	1B	Commer.	V. Sl.	None	1C	Lithopone	B
Maleic Modified L.O.	2A	in	None	None	2B	White	None	None	2C	"	B
Alkyd Resin Air-Dry	3A	Linseed	Sl.	None	3B	House	None	None	3C	"	C
Alkyd Resin Baked	4A	Oil	None	None	4B	Paint	None	None	4C	"	S
Clear Phenolic	5A		Cons.	Bad	5B	V.V. Sl.	V.V. Sl.	5C	"	"	C
Clear Spar Varnish	6A		Cons.	Bad	6B	V.V. Sl.	V.V. Sl.	6C	"	"	C

TABLE #2 - GALVANIZED IRON SCREENS

Screen Coating	Panel	Frame Paint	Stain		Panel	Frame Paint	Stain		Panel	Frame Paint	9
			9 Mo.	2 Years			9 Mo.	2 Years			
None	11A	TiO ₂ , Pb, Zn	None	None	11B	Commer.	None	None	11C	Lithopone	S
Maleic Modified L.O.	12A	in	None	None	12B	White	None	None	12C	"	S
Alkyd Resin Air-Dry	13A	Linseed	None	None	13B	House	None	None	13C	"	S
Alkyd Resin Baked	14A	Oil	None	None	14B	Paint	None	None	14C	"	N
Clear Phenolic	15A		None	None	15B		None	None	15C	"	N
Clear Spar Varnish	16A		None	None	16B		None	None	16C	"	N

TABLE #3

Screen	Panel	Frame Paint	Stain		Panel	Frame Paint	Stain		Panel	Frame Paint	9
			9 Mo.	2 Years			9 Mo.	2 Years			
Lead Coated Iron	21A	TiO ₂ , Pb, Zn	Cons.	Bad	21B	Commer.	None	None	21C	Lithopone	S
Monel	22A	in	Sl.	None	22B	White	None	None	22C	"	B
Plastic "Lumite"	23A	Linseed	None	None	23B	House	None	None	23C	"	N
Alclad	24A	Oil	None	None	24B	Paint	None	None	24C	"	N
Stainless Steel	25A		None	None	25B		None	None	25C	"	N

TABLE #4

Screen	Panel	Frame Paint	Stain 1-3/4 Years
Bronze	30	White	None
Alclad	31	Lead	None
Lead-Iron	32	in	Sl.
Monel	34	Oil	None
Stainless Steel	35		None