

File No. 7726-1
ANALYTICAL RESEARCH DEPARTMENT REPORT

ADP 7727

Subject Extraction of Lead from Cured Paint

Manufacturer S-W Co. Customer

Department Analytical Research

Requested by H. E. Spitzer Date Completed 11/11/71

ABSTRACT

The amount of lead extracted by 4% Acetic Acid and 0.5% HCl from cured films of Super Kem Tone, Dover White, Kem Glo, Dover White, Kem-I-Coat, Bright White, Kem Lustral Enamel, Lemon Yellow and Acrylyd Yellow for Caterpillar are as follows:

Sample	<u>ug of Pb Ext. per Sq. In. of Film</u>	
	<u>4% Acetic Acid</u>	<u>0.5% HCl</u>
K7 W 97	0.4	0.4
K3 W 97	1.2	3.4
A3 W 16	20	52
F65 Y 2	120	460
JX 5630	0.4	26

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cc - KRB FCG RCH JCW

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PURPOSE

As a companion project to ADP-7726 in which various paints were analyzed for lead content, the determination of the amount of lead leached from some of these and other paints was requested. The leaching agents chosen were 4% acetic and 0.5% hydrochloric acid.

The following paints were subjected to the extraction tests:

K7 W 97, Super Kem Tone, Dover White, C2231
K3 W 97, Kem Glo, Dover White, C2281
A3 W 16, Kem-I-Coat, Bright White, C1981
F65 Y 2, Kem Lustral Enamel, Lemon Yellow
JX 5630, Acrylyd Yellow for Caterpillar

The amount of lead present in the above paints is as follows:

Z Pb (on NVH)

K7 W 97	0.0016 - By analysis, ADP-7726
K3 W 97	0.0105 - By analysis, ADP-7726
A3 W 16	0.2153 - By analysis, ADP-7726
F65 Y 2	29.6% - Calculated
JX 5630	26% - Calculated

CONCLUSIONS AND RESULTS

<u>Sample</u>	<u>4% HAC as Extractant</u>		<u>0.5% HCl as Extractant</u>	
	<u>ppm Pb</u> <u>in extract</u>	<u>ug* Pb ext. per</u> <u>sq. in. of film</u>	<u>ppm Pb</u> <u>in extract</u>	<u>ug* Pb ext. per</u> <u>sq. in. of film</u>
K7 W 97	0.2	0.4	0.2	0.4
K3 W 97	0.6	1.2	1.7	3.4
A3 W 16	10	20	26	52
F65 Y 2	60	120	230	460
JX 5630	0.2	0.4	13	26

* 1 ug = 0.001 mg.

The extractions were conducted for 24 hours at room temperature in a cell recommended by FDA. The general procedure closely approximates ASTM F34-68. In the FDA cell 100 sq. in. of film is exposed to 200 ml. of solution.

The amount of lead in the extracts was determined by means of atomic absorption spectrometry.

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An approximate percentage of the lead extracted based on the total lead present is given in the following table for the panels prepared in our laboratory.

	<u>4% HAC</u>	<u>0.5% HCl</u>
K7 W 97, Super Kam Tone	40%	40%
K3 W 97, Kam Glo	14%	40%
A3 W 16, Kam-1-Coat	14%	36%

The corresponding figures for F65 Y 2 and JX 5630, while not estimated, would of course be very low.

The Super Kam Tone, Kam Glo and Kam-1-Coat materials were brushed on aluminum panels and allowed to air dry a minimum of seven days prior to testing. The Kam Lustral panels, which were supplied by Les Williams, were coated in April, 1971. A catalyst, V6 V 241 containing Desmodur N, was used in curing the JX5630 panels supplied by William Whited.

DISCUSSION

Four percent acetic acid was chosen as one of the extractants because it is employed in the FDA procedure for the 'Determination of Lead in Pottery'. In this procedure the vessel is filled with 4% acetic acid, allowed to stand at room temperature for 24 hours, and the lead in the leaching solution determined by atomic absorption. A sample is considered violative if it contains 7.0 or more μg lead per ml. of leaching solution.

The 0.5% HCl extractant was suggested by R. W. Scott as being the approximate concentration of stomach acid.

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