

Lead J. H. REYOL
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ANALYTICAL RESEARCH DEPARTMENT REPORT

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Subject Test for Lead in Lead Free Paints Q48-102

Manufacturer S-W Co. Customer _____

Department Analytical Research

Requested by H. E. Spitzer Date Completed 9/3/71

ABSTRACT

Recent governmental concern over the lead content of "lead-free" interior paints prompted H. E. Spitzer to request that representative S-W "lead-free" paints be analyzed for total lead content. A method was developed and two samples each of Kem-Glo Enamel and Super Kem-Tone were analyzed and found to have lead contents well below the 1% maximum now specified.

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PURPOSE

Governmental concern regarding the lead content of "lead-free" interior paints prompted Analytical Research, at the request of H. E. Spitzer, to develop a method for determining the lead content of total paint samples, and to use the method for the analysis of representative "lead-free" interior paints.

RESULTS & CONCLUSIONS

The method used to determine the total lead content of two Kem-Glo Enamel paints, two Super Kem-Tone paints and one Kem-1-Coat exterior paint involved the digestion of the dry paint sample with a 1:1 hydrochloric-nitric acid mixture followed by oxidation of the digested sample with 3% hydrogen peroxide. The treated sample was then filtered to remove the undigested pigment and then concentrated by evaporation. The concentrated solution was then analyzed by atomic absorption analysis for lead content. The results are as follows:

<u>Sample</u>	<u>% Pb on Total</u>	<u>% Pb on NVM</u>
K3 G 33, Kem-Tone Highgate Green, C1941	0.00074%	0.0012%
K7 G 33, Kem-Glo Highgate Green, C1831	0.00688%	0.0127%
K3 W 97, Kem-Tone Dover White, C2231	0.00096%	0.0016%
K7 W 97, Kem-Glo Dover White	0.00576%	0.0105%
A3 W 16, Kem-1-Coat, C1981	0.15286%	0.2153%

The results indicate that the Kem-Tone and Kem-Glo samples contain lead levels well below the current 1% maximum level specified for interior paints. The sample of Kem-1-Coat was analyzed to test the efficiency of the method since lead naphthenate drier is present in the formula. Based on the formula, the calculated percent lead on the total paint is 0.16973% and on the NVM is 0.239%. The experimental results of 0.15286% and 0.2153%, for the total paint and the NVM respectively, compare well with the calculated percentages.

DISCUSSION

The method for determining the total lead content of the samples involved weighing a ten to twelve gram sample of the total paint into a 125-ml. Erlenmeyer flask with a ground glass neck. The sample was then dried at 105°C. for twelve hours or until little, if any, solvent remained. The sample was then allowed to cool to room temperature and 25 ml. of concentrated HNO₃ and 25 ml. of concentrated HCl were added. A water cooled condenser was then attached and the sample was refluxed until the initial digestion was underway. At this point

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an additional 25 ml. of concentrated nitric acid was added and the reflux continued until the sample appeared to be completely digested. Three percent hydrogen peroxide (25 ml.) was then added and the solution refluxed until all of the peroxide was decomposed. The sample was then allowed to cool at room temperature and filtered into a 400-ml. beaker through highly retentive filter paper. The filtered solution was then evaporated to a volume of approximately 20 ml. and re-filtered into a 50-ml. beaker quantitatively. The filtrate was then quantitatively transferred to a 50-ml. volumetric flask, and the atomic absorption analysis was completed on this solution.

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