ALLIED RESEARCH BULLETIN

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SUBJECT:

ACICULAR BASIC LEAD SULPHATE -

BEHAVIOR IN WHITE PAINTS

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Acicular Basic Lead Sulphate - Behavior in White Paints

General Statement

Some years ago the National Lead Company developed an acicular type of Basic Lead Sulphate - according to report by a precipitation process. Claims having been made for increased durability of those types of zinc oxide which had an acicular structure, the National Lead technicians were inclined to claim superior durability for their new product as compared with the standard type of Basic Lead Sulphate, on the same basis of reasoning, i.e., that a long needle shaped crystal afforded greater durability than the admixture of very short rods and rounded particles of co-fumed Leaded Zinc.

Test Procedure

An exposure series was begun in 1938. Three coats self-primed on White Pine, vertical southern exposure - Chicago paint farm. The standard formula of SWP White was used as the base formula and as the guide coat on each panel.

The pigment composition was represented by:

46% Leaded Zinc 412 dry or substituted pigment.

34% Quick Process Lead (S-W Carter type)

10% Titanium Oxide

10% Asbestine.

The pigments on which this exposure series were based are:

1. Ozlo 412 Block B production.
2. Ozlo 412 Block D production.
3. Mechanical mix 35% Standard B. Ld. Sulph. 65% New Jersey XX Zinc Oxide.

4. Mechanical mix 35% Acicular B. Ld. Sulph. 65% New Jersey XX Zinc Oxide.
5. Mechanical Mix 35% Standard B. L. S. 65% American Zinc Acicular Zinc Oxide.
6. Mechanical mix 35% Acicular B. L. S. 65% American Zinc Acicular Zinc Oxide.

This exposure series brackets Ozlo 412 against mechanical mixtures on one hand and against the effectiveness of acicular Basic Lead Sulphate separately or in conjunction with acicular zinc oxide on the other hand.

Exposure Results

After 21 months' exposure sufficient film breakdowns have occurred to indicate definitely the durability characteristics of Acicular Basic Lead Sulphate.

1. The co-fumed 412 Leaded Zinc exposures show no signs of failure.
2. The equivalent mix of standard grades of Basic Lead Sulphate and American Process Non-Acicular Zinc Oxide is badly checked and cracked, confirming previous similar exposures.
3. The equivalent mixture of Acicular Basic Lead Sulphate and standard Non-Acicular Zinc Oxide badly checked and cracked.
4. The equivalent mixture of standard Basic Lead Sulphate and Acicular Zinc Oxide show no signs of failure.
5. The equivalent mixture of both Acicular Basic Lead Sulphate and Acicular Zinc Oxide show slight but definite checking.

In the above exposures the Basic Lead Sulphate represents 16% of the total pigmentation and the Zinc Oxide 30%.

Even in the small percentage present, the Acicular Basic Lead Sulphate has shown a distinctly detrimental effect.

The presence of the Acicular Zinc Oxide with standard Basic Lead Sulphate shows improved durability over ordinary Zinc Oxide and to date equal to co-fumed Leaded Zinc Ozlo 412.

The situation can be summarized as follows:

Whereas former mechanical mixtures of Basic Lead Sulphate and Zinc Oxide have shown marked inferiority as to durability compared with co-fumed Leaded Zinc, mechanical mixtures in which Acicular Zinc Oxide is used show a marked improvement in durability. Acicular Lead, unlike Acicular Zinc, is a detriment.

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