

LEAD INDUSTRIES ASSOCIATION

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LEAD PIGMENTS*

NOT FOR PUBLICATION

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Last year at this meeting I attempted briefly to cover the past, present and future outlook for lead oxides in the more important industries in which they are consumed. This year, I have been commissioned to cover that same ground plus the white lead pigment field. My remarks will be given with a certain degree of timidity, particularly with respect to future prospects, for on checking upon certain aspects of previous prognostications I find that some expectations have developed in reverse. Covering the same subject two years in succession lays one wide open to critical evaluation of one's forecasting ability, but this hazard I apparently have to take.

The final tonnage figures on lead oxides and white lead in 1949, as compared to 1948, were far from pleasant reading. Litharge declined from 154,775 tons to 118,200 tons, or 23%. Red Lead declined from 30,787 tons to 25,700 tons, or 16%. Therefore the consolidated decline of these two lead oxides was from 185,562 tons to 143,900 tons, amounting to 41,662 tons, or 22.4%. White lead (dry carbonate and dry content in lead in oil plus the white lead content in loaded zinc oxides) declined from 73,046 tons to 42,680 tons, amounting to 30,366 tons, or 42%. Combining lead oxide tonnages with those of white lead, thereby fairly covering the expected outlets for pig lead in the lead pigment producing industry, we arrive at a figure of 258,608 tons of lead pigments shipped in 1948, as compared to 186,580 tons in 1949, a decline of 72,028 tons, or nearly 28%. At this time last year we knew 1949 sales would be considerably less than 1948, but we did not anticipate a decline as great as that which actually took place.

Again with respect to lead oxides, the storage battery industry and predominantly the replacement storage battery business, is the major determining factor. In 1949 replacement battery shipments amounted 18,518,000 units as compared to 23,717,000 units in 1948. The first half of 1949 only 4,873,000 units were shipped but the last half increased to 13,645,000 units, a respectable increase and close to what was anticipated this time a year ago. Mr. Green has gone into that and the present and future outlook for the battery industry in detail, which gives you a much better understanding of that industry's problems and prospects than I could ever hope to. However, as stated before, as the storage battery business goes, so goes the lead oxide business. In 1949, the storage battery industry consumed 63% of the total lead oxides shipped, which was practically identical to the 63.5% figure for 1948. So far this year the movement of lead oxides to storage battery manufacturers has not come up to expectations. Another mild winter in the more densely populated regions has contributed. Even-

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ually the extension of storage battery life will catch up with itself and total shipments of storage batteries for 1950 should exceed those of 1949. Information reaching me indicates that there are no excessive stocks of raw materials or finished batteries in the hands of producers. An upswing in consumer buying could be quickly transferred to demands on oxide producers and in turn to the pig lead producers. As a matter of opinion, for what it is worth, I personally feel that the storage battery industry will very likely require more lead oxides in 1950 than in 1949, and will continue a steadily increasing requirement for the next several years. With over 40,000,000 vehicles in more or less continuous use, new car production at record peaks, the U. S. population increasing more rapidly than anticipated, and the country's income at a high level which I don't believe will ever be allowed to more than hesitate on its way up, by any political party in power, how can the battery business do other than increase its volume in the foreseeable future. Thus, I look for the storage battery business to change the demand position on lead favorably, and in the not too distant future.

The use of lead oxides in the ceramic fields, viz., vitreous enameling, glass and pottery, is holding its own with one exception. The volume in these industries receded in 1949 as compared to 1948, and the sales of lead oxides were correspondingly affected, but the lower lead price has reduced the search for substitutes to some extent. The exception referred to is in the television glass business. Last year I was hopeful that a substantial portion of television glass parts would indefinitely be formulated with lead. This has not happened. Leadless glass has made considerable inroad and is apparently giving satisfactory technical and practical results. There is of course always the chance that there will be a swing back to lead television glass because of economical or technical considerations. The lead oxide producers will be ready if and when that occurs, but there doesn't seem to be anything specific that we can do to hasten same along.

The efforts of the Lead Industries Association in joint research to promote the use of red lead in metal protective paints continues. Several articles have appeared in appropriate trade papers. Red Lead Technical Letters, showing detailed formulations based on red lead for several exposure environments, have been issued and well received. Several more are in preparation. One interesting development was the adoption by the Navy Department of a multiple pigment primer based on red lead. This is an alternate with zinc chromate paint for use on all weather surfaces in maintenance painting. The Navy is manufacturing large quantities of this paint.

There have been no outstanding developments in the color, insecticide, oil refining or other miscellaneous consuming industries, favorable or unfavorable, since my brief discussion of them a year ago.

Nothing was said last year about a fairly new lead product consuming industry, viz., vinyl plastics. Lead compounds of many different compositions have been found to impart varying types of beneficial results to the life or durability of vinyl plastics. The most important function of lead compounds in vinyl resins, however, is to react with the HCL acids that vinyl resins give off on aging, and which, if not taken care of, would cause the plastics to deteriorate much too rapidly. Lead products so used are called stabilizers. The more important ones are litharge, white lead and lead silicates. They are used in varying amounts, running up to 5% on the total weight of the compound. Competition from non-lead products is keen but up to date lead products are increasing in usage. This is a growing market for a great variety of lead products, and a guess would be that several thousand tons per year are currently being consumed in the vinyl plastics industry.

Regarding white lead pigments, I first of all reread the discussion that took place here last year. I'm going to try and reduce my understanding of the situation and problem to something more simple. The downward trend in white lead consumption is obvious to everyone, the previously quoted figures demonstrating. White lead in oil and pure white lead paint has lost ground irreparably. It will, of course,

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never disappear as long as there are craftsmen painters left and consumers who desire the best foolproof kind of a paint job, but the chance of those products making a substantial gain in tonnage is, to my mind, quite improbable. Neither do I believe that such white lead consumption will be much further reduced. In other words, the situation will probably remain fairly static.

The use of white lead (basic carbonate and basic sulphate) in mixed paint is another matter. Such tonnage increased from 61,121 tons in 1946 to 72,233 in '47, decreased to 48,452 in '48 and to 27,853 tons in '49. Ever since the advent of TiO_2 on a commercial basis, white lead has been at a definite disadvantage with respect to hiding or covering power costs. Referring to last year's discussion regarding volume costs, if white lead and TiO_2 sold on an equal volume cost basis (which they do not, white lead being more expensive), with TiO_2 having about 6 times as much hiding power as white lead, no one could afford to use white lead, if covering power was the only consideration. Fortunately, because of the non-reactive chemical characteristics of TiO_2 and the advantageous chemical properties of white lead, the latter has not been completely supplanted by the former. The hiding power qualification of white lead which was extremely important before the advent of TiO_2 has become almost non-essential as such in present day paint making. However, white lead imparts durability qualities to paint that are not found with any other pigment. White lead reacts with the acids of linseed oil forming lead soaps that give elasticity, plasticizing and aging properties to the paint film. Zinc oxide is likewise a desirable chemically reactive pigment and some paint manufacturers believe that they can get along without any white lead in their top coats, using zinc oxide as the sole reactive pigment. This is a very controversial and moot question but we in the lead pigment business have the conviction based on experience that at least a substantial amount of white lead in house paints is preferable and will give better overall results.

It must be remembered, as Mr. Knight pointed out last year, that the paint manufacturer buys practically all of his raw materials on a weight basis, but sells house paints, in which white lead is used, on a volume or gallon basis. The price of white lead reached a peak price of 22¢ per pound in February, 1949. With a lower price for white lead today, price changes have been advantageous to white lead.

COST COMPARISONS

March, 1949 vs March, 1950

	<u>White Lead</u>		<u>Zinc Oxide</u>		<u>Titanium Dioxide</u>	
	<u>Price per Pound</u>	<u>Price per Gallon</u>	<u>Price per Pound</u>	<u>Price per Gallon</u>	<u>Price per Pound</u>	<u>Price per Gallon</u>
Feb. 1949	20½¢	\$11.60	15½¢	\$7.28	19½¢	\$6.82
Mar. 1950	14¢	7.92	11¢	5.17	19½¢	6.82

The solid gallon price of white lead is now much closer to the price of titanium dioxide - \$7.92 vs \$6.82. This all to the good and helps.

However, the paint man's philosophy of formulation has changed. Twenty odd years ago he tried to carry as much white lead per gallon of paint as possible, and so formulated the extender content.

The paint industry has just been going through and is still in a period of low white lead content paints. To change this situation is not an easy task if for no other reason than that there has been satisfaction with the low-lead content and leadless paints.

Today, in general, the formulator of white lead containing paints starts with about 15% titanium dioxide in the pigmentation.

This amount of titanium dioxide requires approximately 32% of zinc oxide. The amount of extender or inert averages 31%. This makes a total of 78%. The difference between 78% and 100% is 22%. If every can of house paint carried 22% white lead by weight in its pigment portion, which it does not because of the large quantity of lower lead and leadless paints being manufactured, the tone of white lead sold today would be considerably greater than they are.

The current revision of Federal Specification TT-P-40 for exterior house paint reduces the amount of white lead from 41% to 31%; the titanium oxide content is upped from 11% to 16% and the inerts are upped from 15% to 26%. Such a paint has shown good performance in wide usage on Army barracks. Our objective should be to maintain the white lead content of all house paint around 30% of the pigmentation, and by this I mean white leads containing no less than 70% lead content. If this could be accomplished the white lead (carbonate and sulphate) presently being consumed would be more than doubled.

How can this be done? The Lead Industries Association proposes making the paint manufacturer more conscious of the value of white lead in paint, thru suitable publicity in appropriate trade papers, and presentation of technical papers before paint production personnel. A close follow-up by individual pigment producers can be expected. In the paint industry, there is a concentration of house paint production in a relatively few plants. Thus, a big goal is present in a limited area of work.

The public has never lost its respect for white lead. White lead and linseed oil are the two paint ingredients with which it is most familiar, so our efforts will be attacking fertile soil. This acceptance should be fostered to the best of our promotional and financial ability.