

#40 Outside White
301 Line House Paints
Trade Sales

Dr. H. H. Hopkins, Wilm. D-7026
Mr. J. B. Bullitt, Lab.
Mr. C. R. E. Merkle, Lab.
Mr. J. W. Iliff, Lab.
Mr. K. C. Lampert, Lab.

"INDEXED"

Je 25 '53

Philadelphia Laboratory
December 17, 1945

MEMORANDUM REPORT #M-19

RETURN TO MARSHALL LABORATORY LIBRARY

REFERENCE COPY

"TI-CAL" AND "TI-BAR" EXTERIOR HOUSE PAINTS
~~NOT FOR CIRCULATION~~

We recently reviewed the Pigments Department's exposure panels and house tests in the Wilmington vicinity covering rutile "Ti-Cal" Exterior House Paint formulations. Our present interest would be in a carbonate white lead-free and low oil formulation similar to the 40/45/15 "Ti-Cal" R-20/35% leaded zinc oxide/asbestine product included in these exposure tests. The Philadelphia Laboratory has no exposure information on rutile "Ti-Cal" products of this nature.

As a result of this review of tests ranging in age from 1 to 3-1/2 years, we have reached the following conclusions:

1. No 45° South exposures were available for inspection and since the oldest vertical exposures were only 3-1/2 years, we have no evidence on the ultimate type of failure and, accordingly, do not know whether final failure will be by chalking and erosion or by flaking. However, as far as the tests have gone, they indicate that rutile "Ti-Cal" exterior paints may be quite comparable in ultimate durability to titanium dioxide-asbestine formulations similar to our #40 Outside White, both at the high oil and the low oil (OPA-M-332) level. This refers to performance on good lumber and we have no information regarding durability on poorer grades of lumber, such as yellow pine. It is possible that a durability sacrifice may result on the poorer woods, but the degree of such sacrifice is unknown.

2. Dirt collection of the rutile "Ti-Cal" formulation is heavier than with anatase titanium dioxide products, but not as heavy as lead-in-oil. Dirt collection of the "Ti-Cal" materials appears to be comparable to products made with "Ti-Pure" YCR or R-110 and somewhat heavier than "Ti-Pure" R-200. Based on our own exposure evidence, we have considered R-200 unsatisfactory for self-cleaning house paints, particularly in areas of heavy dirt collection. This means that a rutile "Ti-Cal" formulation should probably be marketed under a special label with no reference to self-cleaning properties.

3. As far as we could tell from the house tests in question, the screen staining of the "Ti-Cal" house paints from copper or bronze appears to be at least as bad as present TiO₂ asbestine formulations.

Since delayed chalking is expected with the rutile "Ti-Cal" type products, this might further aggravate screen staining.

(Lead-Zinc Type)
4. Compared to 301-904 T. & C. house paint, we believe the "Ti-Cal" type would perform much more satisfactorily both as regards ultimate durability and dirt collection. This is based entirely on our best judgment without any actual supporting evidence.

We believe a "Ti-Bar" type house paint on the low oil basis would be satisfactory, although we have no evidence on such a material. We base this belief on our extensive sale of 301-18924 High Oil "Ti-Bar" House Paint, which was our original titanated #40 Outside White. We understand that all current "Ti-Bar" (except YCR) is of the free chalking anatase type, which should be equally as good as our present Outside White insofar as dirt collection and self-cleaning is concerned. Based on past experience with 301-18924, we would expect slightly greater cracking and flaking tendencies than our present and recent TiO_2 asbestine formulas.

Since we have had experience on an anatase "Ti-Bar" house paint, we would prefer this type to the rutile "Ti-Cal" formula on which we have had no experience. In addition, with the "Ti-Bar" type, we would maintain our present position on self-cleaning.

PHILADELPHIA LABORATORY

K. C. LAMPERT

KCL:MEH