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MILDEWING OF POLYBUTYL METHACRYLATE
EMULSION PAINTS

Exposure Series #12266 indicated that a polybutyl methacrylate emulsion paint was susceptible to mildewing. In order to compare the mildewing of the emulsion paint with and without various fungicidal agents, Exposure Series #12621 was prepared. After four months outdoor exposure the data is insufficient for a valid conclusion on mildewing although tentative indications show that the mildewing on the emulsion paint is greater than on No. 40 Outside White.

An attempt was made to obtain some rapid qualitative information on mildewing by exposing small panels directly to fungal attack in a chamber in which the relative humidity was 100% and the temperature 25°C. This was done at the Pest Control Section of Grasselli Chemicals Department. From these exposures it was possible to draw the following conclusions:

(1) Polybutyl methacrylate emulsion clear is more susceptible to mildewing than polybutyl methacrylate solution clear which compared favorably to a "Dulux" + 7% Polymer K clear. This may in part be due to the emulsifier in the emulsion.

(2) N-dodecyl maleamic acid and Duponol ME, which were used as stabilizers, attract mildew.

(3) Pigmentation of polybutyl methacrylate emulsion and solution with W-50 decreases the mildew resistance of both. The mildew growth on the panels of pigmented polybutyl methacrylate solution was slightly greater than that on the panels containing No. 40 Outside White.

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(4) The fungicides in decreasing order of effectiveness were Dowicide G, Shirilan Extra, phenyl mercury oleate, and aluminum silicofluoride. Dowicide G and Shirilan Extra were about equal in effectiveness, both showing no mildew growth after thirty days. Aluminum silicofluoride showed no mildew resistance whatsoever.

It would appear from the above conclusions that the formulation of a mildew-resistant polybutyl methacrylate emulsion paint will require the presence of a fungicidal agent. Since Shirilan Extra causes yellowing, Dowicide G would seem to be a good choice.

In another series that was sent to Grasselli the emulsion and solution paints were brushed on both white pine panels and on bonderited panels. In no case did the paint on the bonderited panels support mildew whereas the paint on the white pine panels did support mildew. This would lead one to conclude that the mildew attack is through the wood (possibly by leaching of water soluble nutrients). No attempt was made of correlating this with outside durability tests. As a matter of fact the results, because of the nature of the test, should not be accepted as conclusive. One further conclusion could be drawn from this series. The N-dodecyl maleamic acid in the solution paint did not cause as extensive mildewing as the N-dodecyl maleamic acid in the emulsion paint. An attempt will be made to correlate this with hardness and irregularity of surface.

From the Delaware exposure it was evident that dirt collection would also be a major problem. The addition of fungicidal agents would retard the growth of mildew, but would have no effect on dirt collection. To study the dirt problem Exposure Series #12855 was prepared in which the pigments were free chalking TiO₂ (W-16), chalk-resistant TiO₂ (W-50), and a 50/50 mixture of W-16 and W-50. This study should give some information on the effect of TiO₂ pigment variation on cleanliness and film integrity of polybutyl methacrylate emulsion paint. No results have yet been obtained on this series.

Action Taken:

A new exposure series will be prepared by Mulholland to determine if mildew does attack through the wood. The exposure series now on exposure will be evaluated periodically and any new points of interest will be investigated.

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GIM:aub
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