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1/22/51

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Marshall Laboratory
January 22, 1951

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MEMORANDUM REPORT NO. M-330

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GLOSS MEASUREMENTS IN EXPOSURE STUDIES

In the course of our study on film deterioration we have utilized gloss measurements as a means of following degradation. From data for our control series using 94-P-60678 we have determined on the basis of many replicates that utilizing our procedure the average standard deviation is only 2 gloss units.

We have followed loss of both 60° gloss and 20° gloss as measured with the duPont Universal Glossmeter.

It has been determined that the first signs of film failure are conversion of an originally hydrophobic surface to an hydrophillic one and a nearly simultaneous development of a surface disruption which is not apparent to the eye, but which can be followed reproducibly by 20° gloss measurements. This is shown in the attached graph.

It is entirely possible that loss of 20° gloss to a predetermined low value or 0 will be reproducible and directly related to the ultimate durability of a finish. If this should prove to be the case, it would mean that durability results could be obtained in 3 or 4 months for most finishes. (94-P-60678 as prepared for this series seems to have outstanding durability).

It is suggested that this method be tried in cases where early results are desired, and interested parties could investigate its applicability by the simple experiment of putting out 6 panels to be returned in duplicate after 3, 4 and 5 months exposure (or 9 panels if triplicate data is preferred), and correlating results with the "ultimate" durability. A control should of course be used since outdoor exposure is variable.

In utilizing this method we have measured the initial gloss, and on receipt of the panels from Florida washed them very carefully with a soft cloth using a Dupinol solution. The panels were then rinsed, blotted dry and gloss measurements made on the clean panels.

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ATTACH:

N35441

EXPOSURE VS GLOSS FOR 94 P-60678

