MICHIGAN
STATE HIGHWAY DEPARTMENT
G. Donald Kennedy
State Highway Commissioner

PROGRESS REPORT

ON

REFLECTORIZED SIGN MATERIAL INVESTIGATION

By

E.A. Finney

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The data and conclusions presented herein are based on several preliminary studies conducted on three types of reflectorized sign materials known as Scotchlite, Prismo and Decal. The materials have been studied in a comparative manner for durability, visability and physical structure.

Durability Study:

In order to determine the relative ability of the several materials to withstand weathering in service, two specimens of each type were subjected to an accelerated weathering test. This test consisted in exposing the specimens in an Atlas Weather-O-Meter to the action of light and a mild spray of water at a temperature of 130° F for seventeen hours, followed by three hours of a vigorous spray at tap water temperature, and one hour of exposure in a cold room at 0° F. The duration of the test was 30 cycles. It is estimated that 30 cycles described above are approximately equivalent to one year of outside weathering.

Five factors were especially noted during the durability test. They are: First, discoloration of the beaded surface; second, loss of beads; third, loss of reflecting characteristics; fourth, disintegration or deterioration of background material in which the glass beads are set, and fifth, adhesion of the material to sign base.

Discoloration of Surface: Discoloration of the surface of each material was noticeable upon completion of the test. The condition apparently is due to the action of ultra violet light and oxidation on the resins in the matrix. Scotchlite seemed to have more discoloration than the other two materials. It was understood recently that the Scotchlite people were aware of this weakness in their product and have developed a new base. The tests were made on the old material.

Loss of Beads: Loss of beads was extremely rapid in the Prismo material amounting to approximately 20-30 percent. Whereas the loss of beads in the Scotchlite and Decal was practically 0 percent.

Loss of Reflecting Characteristics: Loss of reflecting power was apparent in all cases. It was estimated to be approximately 25-30 percent for all materials.

Disintegration of Background: Very slight disintegration was noted in the matrix for Scotchlite and Decal. Only in the case of the Prismo did the material appear to crack around the beads.

Adhesion of Materials to Sign Base: In all cases the reflecting material adhered perfectly to the sign base.

Visibility:

The study of visibility included both range and legibility. The materials Scotchlite and Prismo were available for this study.

Range: The test consisted of a comparison of reflecting power over a course of 1000 feet using automobile head lamps as light source. The reflecting material was established on 2' x 2' sign boards placed side by side at regular sign height 10 feet from travel way. The results were observed visually by the driver and an observer in the car. The results are as follows:

The Scotchlite was brighter from 1000 feet to 75 feet. At 75 feet they were of apparently equal intensity. At distances less than 75 feet the Prismo was the brighter. Scotchlite yellow was found to be even brighter than the Prismo white between the distances of 75 - 1000 feet.

SUMMARY

On the basis of the few preliminary studies described above, we believe the following conclusions are justified.

1. Scotchlite reflecting material seems to discolor more than either Prismo or Decal. The efficiency of the Scotchlite was found to be comparable

to the other materials in brilliancy after weathering.

2. The retention of the beads is an all important characteristic of reflecting materials. Prismo is inherently weak in this respect.

3. Long range brilliancy and visibility should be important characteristics of any reflecting material. Scotchlite was found to be superior in both respects.

It is proposed to study further the legibility of highway signs using standard sign wording on a background of different reflecting materials.