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RESEARCH UPDATE

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3M 350 SERIES PAVEMENT MARKING TAPE

HISTORY:

350 Series permanent pavement marking tape, made by 3M, was applied in a test deck on Rte 302 along with "Stamark 5730" by the same manufacturer. The 350 series was applied as a transverse line and as alternating longitudinal lines in the deck.

The markings have been exposed to approximately 7000 vehicle passes per day. Both the 350 and 5730 series tapes have exhibited good durability. Wear has been limited to a reduction in tape thickness and minor edge loss in the wheelpath. The degree of wear varies according to whether the particular strip is located in the wheelpath or not. The wear on the 350 has reduced but not eliminated the raised diamonds.

The reflectivity of both products was excellent initially but decreased rapidly with exposure. Observations made in December of 1986 and January of 1987 revealed no difference between the two products.

Samples of the 350 tape were removed from the test deck on March 30, 1988 and compared microscopically with an unused control sample which had been kept on file.

Sample #1-The unused tape. The top surface of the raised diamond pattern has the appearance of being 90%+/- covered with glass beads. Most beads do not appear deeply embedded. The floor of the valleys between the diamonds appears to be 85% plastic matrix broken by 15% of deeply embedded beads. These deeply embedded beads would not provide much reflectivity while the tape is in "new" condition but should as they are exposed by tapewear.

Sample #2-Taken from the shoulder edge of the transverse stripe. The diamonds are about 10% worn. Only about 5% to 10% of the surface still has beads with more being concentrated along the perimeter of each diamond. There are many dirt filled sockets where beads were lost and there are many beads on the surface which are cracked or scratched. In the valleys there has not been enough wear to expose more beads while dirt has reduced visibility of the tape.

Sample #3 taken from the trailing end of the longitudinal strip located in the right wheel track. This sample is more severely worn with 37% of the thickness lost. Approximately 5% to 10% of the surface still has beads and approximately 1/2 the remaining beads are cracked or scratched. There is little if any difference between valleys and tops because of the wear.

Over

STATUS:

350 series tape has exhibited excellent durability through 21 months of service. The product has provided delineation due to color contrast even though it suffered significant loss of reflectivity within 6 to 8 months of exposure.

At \$1.50/LF the product is much more expensive than standard traffic paint, which is applied at \$0.04/LF and 2 to 3 times more expensive than alkyd thermoplastic which varies from \$0.50 to \$0.80/LF.

RECOMMENDATION:

Durable marking should be used where high traffic or geometric considerations make it desirable to limit work in the roadway. Series 350 tape may provide the necessary guidance to drivers when used in conjunction with artificial lighting to reduce the impact of reflectivity loss. Because of its high cost and significant early loss of reflectivity, extensive use of 3M 350 series durable marking tape is not recommended.