

OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

January 9, 1976

To: L. T. Oehler
Engineer of Research

From: A. R. Gabel

Subject: "Improved Alert" Reflective Liquid (Cataphote Corp.) and "B-I-P" Reflective Liquid from Flex-O-Lite Corp. Research Project 71 NM-291. Research Report No. R-985.

The first "Alert" liquid was field evaluated under 67 NM-172 with results presented in Research Report No. R-713 showing the material subject to flaking loss, and inferior to 3M's "Codit" used by the Department for night-time pier delineation.

Subsequently, an "improved formula Alert" was submitted by the producer and applied on four piers on the Everett St Bridge over I 496 on August 4 and 5, 1971. A competitive new material, "B-I-P" (beads in paint) manufactured by the Flex-O-Lite Corp. was also applied, using 3M's Codit for comparison.

Daytime ratings were made at the end of 11-1/2, 23 and 51 months; night ratings for reflectivity were made at the end of 24-1/2 and 51 months as listed in the attached tables.

A review of Table 1 and Figures 1 and 2, covering durability of the reflective coatings, shows that the improved Alert had excellent durability during the first 23 months of service, equivalent to that of 3M's Codit. Its durability deteriorated at a faster rate in the period from 23 to 51 months of service showing a loss of 35.6 percent vs. 10 percent for the Codit. The B-I-P coating showed unsatisfactory and excessive loss, early and throughout the 51 months of service exposure.

A review of Table 2 shows that the night visibility of the reflective liquids, the important quality in rating of pier delineation coatings, was roughly dependent on the durability ratings, i. e., good durability yields good night visibility.

For information purposes, the three service tested reflective liquids differed somewhat in color on a white to gray scale, with the improved Alert the grayest and the Codit the whitest. This is not considered an important quality in pier delineation coatings, however.

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Service exposures showed that the improved Alert reflective liquid, though improved over the originally tested material, was somewhat inferior in long range durability and night visibility as compared to Cedit being used by the Department for pier delineation.

Service exposures of the B-I-P coating, a competitor's new material, show it to be inferior to both of the above coatings, and apparently in need of further development by the producer.

TESTING AND RESEARCH DIVISION

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ARG:bf

TABLE 1
DURABILITY OF REFLECTIVE COATINGS
I 496 Piers

Material	Eastbound Shoulder, percent loss	Westbound Shoulder, percent loss	Eastbound Median, percent loss	Westbound Median, percent loss	Average Percent Loss
11-1/2 Month Day Rating					
Cataphote - Improved Alert	0	0	0	0	0
Flex-O-Lite - B-I-P	50	50	10	30	35
3M - Codit	0	0	0	0	0
23 Month Day Rating					
Cataphote - Improved Alert	2	10	2	0	3.5
Flex-O-Lite - B-I-P	40	90	10	20	40.0
3M - Codit	0	2	0	0	0.5
51 Month Day Rating					
Cataphote - Improved Alert	40	30-35	30	40	35.6
Flex-O-Lite - B-I-P	70	90-95	40	80	70.6
3M - Codit	10	10	10	10	10.0

TABLE 2
NIGHT VISIBILITY OF REFLECTIVE COATINGS
I 496 Piers

Material	Eastbound Shoulder, Reflective Brightness*	Westbound Shoulder, Reflective Brightness	Eastbound Median, Reflective Brightness	Westbound Median, Reflective Brightness	Average Reflective Brightness
24-1/2 Month Night Rating					
Cataphote - Improved Alert	5-1/2	4	6-1/2	7	5-3/4
Flex-O-Lite - B-I-P	3	1-1/2	5	5	3-5/8
3M - Codit	8	7	8	8	7-3/4
51 Month Night Rating					
Cataphote - Improved Alert	4-1/2	7	5-1/2	5-1/2	5-5/8
Flex-O-Lite - B-I-P	2-3/4	1-1/2	1-3/4	1-1/2	1-7/8
3M - Codit	8	8	7-3/4	6	7-3/8

* Reflective ratings were made on the basis of brightness using a scale of 0 to 10 with 10 representing the highest brightness.

Figure 1. Stripes of Cataphote's "Improved Alert" (A) Flex-O-Lite "BIP" (B) and 3M "Codium" (C) after 23 months service on Everett St pier, eastbound I 496.



Figure 2. Same pier after 51 months of service.