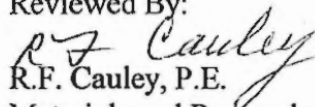
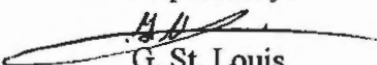


Reviewed By:


R.F. Cauley, P.E.
Materials and Research
Engineer



Prepared By:


G. St. Louis
June 9, 1998
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RESEARCH UPDATE

Update U1998-3

**EPOPLEX EPOXY PAVEMENT MARKINGS
(FINAL REPORT)**

REFERENCE:

WP 94-R-23, U94-16, U95-2, U96-16, U97-7

HISTORY:

In November 1994, EPOPLEX epoxy paint was applied as edge and centerline pavement markings on 1.73 miles of US 302 as part of the Barre F 026-11 (36)S project. The markings were evaluated for durability and reflectivity on April 18, 1995 and received an excellent rating. Retroreflectivity readings taken at that time indicated that the product was adequately visible during night and adverse conditions. Ten readings were taken, with the averages being 140, 309, and 160 millicandelas (mcdl). In August 1997, the retroreflectivity was measured with an *Ecodyn* mobile retroreflectometer. The readings had dropped to 94 mcdl for the white edgeline and less than 40 mcdl for the yellow center line.

PRODUCT:

EPOPLEX LS 5, a two component, 100% solids, epoxy coating material was selected for this project. LS5 is designed to be a rapid setting highway marking offering durability and abrasion resistance. Drying time is estimated to be 10 minutes at 77°F.

INSTALLATION:

The markings were applied on November 16, 1994, with the ambient and surface temperatures being 40°F and 43°F, respectively. Tests indicated that the average thickness of the epoxy was 23 mils. The material took approximately 20 minutes to totally dry, due to the cold conditions.

STATUS:

As of June 1998, the average retroreflectivity for the yellow center line was 45 mcdl, and the white edge line was 82 mcdl. The loss of material is estimated at 15%. The markings have sustained expected plow damage (chipping at the edges) over the four winters of exposure.

The color of the white line is good, while the yellow lines are turning a brownish hue, a characteristic of aging epoxy.

During the time period April 1995 thru June 1998, the yellow center line and the white edge line were measured for retroreflectivity at three separate sites: MM 1.40, MM 2.10, and MM 2.65. Because of safety reasons, the yellow center line was measured only once at each site, while five different readings were taken on the white edge line. A comparison of the averages at each site, as well as the average for all three sites, according to year is indicated below:

		Edge	Line*			Center Line**	
MM	4/95	5/96	8/96	6/98	5/96	8/96	6/98
1.40	160	149	129	80	131		70
2.10	309	174	127	82	87		31
2.65	140	169	61	84		45	35
Average (for all three sites)	203	164	106	82	109	45	45

* Each value is an average of 5 readings

** One reading per site

The August 1996 and June 1998 readings were measured with the LTL 2000 reflectometer while the other readings used the MiroLux 12. The current retroreflectivity is below the Agency's unofficial low limit of 100 mcd. However, it is similar to a freshly applied waterborne line.

COST:

If the material is remarked this year, the estimated annualized cost per linear foot is \$0.07 vs. \$0.05 for waterborne traffic paint. If increased legibility and durability of the markings during the first few years is taken into account, the increased cost of the material may be justified.

RECOMMENDATION:

Remarking is necessary at this time due to the retroreflectivity readings being below the VAOT unofficial low limit of 100 mcd. The markings will reach their unofficial life span of four years in November 1998, after four winter seasons. During the latter two years, the performance of this material has in some areas barely been adequate and in others, has not been adequate. This is especially true for the yellow center line. For these reasons, EPOPLEX should be added to the Agency's approved product list on a "conditional" basis. That is, if EPOPLEX is installed on one or more projects, those projects will be monitored to gather more data on the durability and retroreflectivity of this material.