2008 NTPEP Report Series

NTPEP Report 4012.2

Laboratory and Field Evaluations of Non-Bituminous Hot Melt Pavement Marker Adhesive Georgia Test Deck

Two Year Evaluation (Fall 2006 Product Submissions)

October 2008

American Association of State Highway and Transportation Officials (AASHTO)

Executive Office: 444 North Capitol Street, NW, Suite 249 • Washington, DC • 20001
(t) 202.624.5800 • (f) 202.624.5806 • www.aashto.org

PROLOGUE

General Facts about NTPEP Reports

- NTPEP Reports contain data collected according to laboratory testing and field evaluation protocols developed through consensus-based decision by the AASHTO's NTPEP Oversight Committee. These test and evaluation protocols are described in the *Project Work Plan* which is available from AASHTO.

- Products are voluntarily submitted by manufacturers for testing by NTPEP. Testing fees are assessed from manufacturers to reimburse AASHTO member departments for conducting testing and to report results. AASHTO member departments provide a voluntary yearly contribution to support the administrative functions of NTPEP.

- AASHTO/NTPEP does not endorse any manufacturer's product over another. Use of certain proprietary products as "test control specimens" does not constitute endorsement of those products.

- AASHTO/NTPEP does not issue product approval or disapproval; rather, test data is furnished for the User to make judgment for product prequalification or approval for their transportation agency.

Guidelines for Proper Use of NTPEP Results

- The User is urged to carefully read any Introductory notes at the beginning of this Report. Also, to consider any special clauses, footnotes or conditions which may apply to any test reported herein. Any of these notes may be relevant to the proper use of NTPEP test data.

- The User of this Report must be sufficiently familiar with the product performance requirements and/or (standard) specification of their agency in order to determine which test data is relevant to meeting those qualifying factors.

- NTPEP test data is intended to be predictive of actual product performance. Where a transportation agency has successful historical experience with a given product it is suggested to factor that precedence in granting or withholding product approval or prequalification.

NTPEP Report Special Advisory for Raised Pavement Markers (RPM)

- For transportation agencies who desire to have *temporary or permanent raised pavement markers* periodically resubmitted for NTPEP evaluation, the Raised Pavement Markers Project Panel recommends a retest period of no less than 5 years. (Adopted May 1999)

- The User is urged to read the introductory text to this NTPEP Report as it provides explanation on procedures and conduct of testing and relevant site specific information. Also, the User is urged to carefully read the Project Work Plan presented in Appendices of this NTPEP Report.

- For specific questions regarding this NTPEP Report or for advice on how to implement NTPEP data furnished in this Report the User is encouraged to contact the NTPEP Coordinator at (202) 624-7830 for a listing of NTPEP Lead States.

***Donald Wishon* (GA)**
Chairman, RPM Project Panel

***Brad Young* (OH)**
Vice Chairman, RPM Project Panel

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Report of

Laboratory and Field Evaluations of Non- Bituminous Hot Melt Pavement Marker Adhesive Georgia Test Deck

TwoYear Evaluation (Fall 2006 Product Submissions)

Testing & Reporting Hosted for NTPEP by:

Georgia Department of Transportation

In cooperation with

Florida Department of Transportation

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Purpose

The purpose of the National Transportation Product Evaluation Program (NTPEP) is to provide a cost-effective method of evaluation for materials of common interest among all participating NTPEP member departments. NTPEP reports allow member states to evaluate various materials without any investment of time and manpower. NTPEP evaluations provide only data on the materials being tested; no conclusions are given on the materials. Conclusions are left up to each member department.

Introduction

This report summarizes the NTPEP results of data collected for the 2006 field evaluations of Non-Bituminous Hot Melt Adhesive. This report contains the 6-month, 1-year, 18-month, and 2-year field evaluations of Serpak, Inc. Non-Bituminous Hot Melt Adhesive, as well as initial laboratory evaluations.

Referenced Documents

ASTM D4280 "Specification for Extended Life Type, Non-Plowable, Prismatic, Raised, Retroreflective Pavement Markers"

Non-Bituminous Hot Melt Adhesive Tested

Manufacturer	Product	NTPEP #
Serpak, Inc.	Serpak Marker Bond 1587 Adhesive	RPM (06GA)-02

Raised Pavement Markers Used

Manufacturer	Product	NTPEP #
Swareflex Corporation	Swareflex Globemarker Model – 3552-22-102 (W/R) Markers	The Swareflex marker was used to test the manufacturer's Non-Bituminous Hot Melt Adhesive and has no NTPEP #.

Product Manufacturers

NTPEP #	Manufacturer	Address	Contact and Phone Number
The Swareflex marker was used to test the manufacturer's Non-Bituminous Hot Melt Adhesive and has no NTPEP #.	Swareflex Corporation	P.O. Box 52046 Irvine, CA 92619	Larry Meketarian 949-716-9925-Office 949-716-9929-Fax
RPM (06GA)-02	Serpak, Inc.	604B Industrial Court, Woodstock, GA 30189	Mike Morton 770-516-0506-Office 888-772-3777-Office

Installation

The raised pavement markers were installed on October 24, 2006 in Macon, Georgia (Bibb County) on I-75 on concrete pavement using a Non-Bituminous Hot Melt Adhesive. The markers were placed between milepost 159.2 and 159.3 in the northbound lane. Raised pavement markers were also installed on October 24, 2006 in Macon, Georgia (Bibb County) on I-475 on asphalt pavement using a Non-Bituminous Hot Melt Adhesive. These markers were placed between milepost 1.2 and 1.3 in the northbound lane. During the evaluation period, the average daily traffic on the 0.10 mile test deck of I-75 in Bibb County was **67,590**. The percentage of truck traffic was **17.8%** or **12,031** trucks daily. The average daily traffic on the 0.10 mile test deck of I-475 in Bibb County was **47,260**. The percentage of truck traffic was **11%** or **5,199** trucks daily.

Field evaluations of the Non-Bituminous Hot Melt Adhesive consisted of visual observations. These visual observations can be found in Tables 1 and 2.

Table 1: Weather Conditions

Month	Average Temperature (^{o}F)	Total Precipitation (in.)
October 2006	**63.2**	**2.23**
November 2006	**54.8**	**3.05**
December 2006	**51.1**	**5.99**
January 2007	**48.9**	**4.43**
February 2007	**47.3**	**2.19**
March 2007	**59.8**	**1.49**
April 2007	**61.0**	**2.15**
May 2007	**71.1**	**[1]T**
June 2007	**79.0**	**4.69**
July 2007	**79.7**	**6.22**
August 2007	**84.6**	**6.15**
September 2007	**75.7**	**3.10**
October 2007	**67.4**	**1.29**
November 2007	**54.1**	**1.19**
December 2007	**53.0**	**6.86**
January 2008	**44.8**	**3.80**
February 2008	**51.2**	**5.77**
March 2008	**56.4**	**2.41**
April 2008	**63.1**	**3.08**
May 2008	**71.5**	**1.04**
June 2008	**80.8**	**4.72**
July 2008	**81.2**	**5.08**
August 2007	**80.0**	**6.82**
September 2007	**75.6**	**0.36**

[1] T indicates trace precipitation, an amount greater than zero, but less than the lowest reportable value.

[2] The ambient temp or official low on the date of installation, October 24, 2006 in Macon, Georgia (Bibb County) on I-475 on asphalt pavement, was 32°F. The road surface temperature at the beginning of installation was approximately 38°F.

[3] The adhesive temperature at the application point was 332°F.

Table 2: Non-Bituminous Hot Melt Adhesive Laboratory Evaluations – RPM (06GA)-02
Initial Laboratory Evaluations

These laboratory evaluations were done at the Georgia Department of Transportation Bituminous Control Laboratory on the following product:

Serpak Marker Bond 1587 Adhesive - RPM (06GA)-02

Non-Bituminous Hot Melt Adhesive Laboratory Tests	Results
Penetration (dmm) 100g, 5 sec, 77 °F	29
Softening Point, Deg. F.	293 °F
Viscosity, 400 °F, poises	138
Ductility @ 77 °F	19 cm
Flow (Inches)	0.00
Heat Stability	Could Not Run
Flashpoint	555 °F
Flexibility	Pass

Table 3: Non-Bituminous Hot Melt Adhesive Field Evaluations - RPM (06GA)-02
6-Month Test Results - 03-28-07

Serpak Marker Bond 1587 Adhesive - RPM (06GA)-02

- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the concrete test deck of 100 markers.
- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the asphalt test deck of 100 markers.

Serpak Marker Bond 1587 Non-Bituminous Hot Melt Adhesive Field Evaluations Test Sections	**Test Results**
I-75 Northbound Concrete Milepost 159.2 and 159.3 in the Northbound Lane **(6-Month Test Results - 03-28-07)**	99 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 1 of 100 markers are missing from Concrete Pavement**
I-475 Northbound Asphalt Milepost 1.2 and 1.3 in the Northbound Lane **(6-Month Test Results - 03-28-07)**	87 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 13 of 100 markers are missing from Asphalt Pavement**

Table 4: Non-Bituminous Hot Melt Adhesive Field Evaluations - RPM (06GA)-02
12-Month Test Results - 10-05-07

Serpak Marker Bond 1587 Adhesive - RPM (06GA)-02

- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the concrete test deck of 100 markers.
- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the asphalt test deck of 100 markers.

Serpak Marker Bond 1587 Non-Bituminous Hot Melt Adhesive Field Evaluations Test Sections	**Test Results**
I-75 Northbound Concrete Milepost 159.2 and 159.3 in the Northbound Lane **(12-Month Test Results - 10-05-07)**	96 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 4 of 100 markers are missing from Concrete Pavement**
I-475 Northbound Asphalt Milepost 1.2 and 1.3 in the Northbound Lane **(12-Month Test Results - 10-05-07)**	87 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 13 of 100 markers are missing from Asphalt Pavement**

Table 5: Non-Bituminous Hot Melt Adhesive Field Evaluations - RPM (06GA)-02
18-Month Test Results - 03-26-08

Serpak Marker Bond 1587 Adhesive - RPM (06GA)-02

- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the concrete test deck of 100 markers.
- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the asphalt test deck of 100 markers.

Serpak Marker Bond 1587 Non-Bituminous Hot Melt Adhesive Field Evaluations Test Sections	**Test Results**
I-75 Northbound Concrete Milepost 159.2 and 159.3 in the Northbound Lane **(18-Month Test Results - 03-26-08)**	67 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 33 of 100 markers are missing from Concrete Pavement**
I-475 Northbound Asphalt Milepost 1.2 and 1.3 in the Northbound Lane **(18-Month Test Results - 03-26-08)**	79 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 21 of 100 markers are missing from Asphalt Pavement**

Table 6: Non-Bituminous Hot Melt Adhesive Field Evaluations - RPM (06GA)-02
24-Month Test Results - 09-25-08

Serpak Marker Bond 1587 Adhesive - RPM (06GA)-02

- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the concrete test deck of 100 markers.
- Swareflex Globemarker Model – 3552-22-102 (W/R) Markers were used in the Non-Bituminous Hot Melt Adhesive section of the asphalt test deck of 100 markers.

Serpak Marker Bond 1587 Non-Bituminous Hot Melt Adhesive Field Evaluations Test Sections	**Test Results**
I-75 Northbound Concrete Milepost 159.2 and 159.3 in the Northbound Lane **(24-Month Test Results - 09-25-08)**	35 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 65 of 100 markers are missing from Concrete Pavement**
I-475 Northbound Asphalt Milepost 1.2 and 1.3 in the Northbound Lane **(24-Month Test Results - 09-25-08)**	79 of 100 of the Swareflex Globemarker Model - 3552-22-102 (W/R) Markers are still bonded to the pavement. **Total Missing Markers - 21 of 100 markers are missing from Asphalt Pavement**

"The National Transportation Product Evaluation Program (NTPEP) was established by the American Association of State Highway and Transportation Officials (AASHTO) in early 1994. The program pools the professional and physical resources of the AASHTO member departments in order to test materials, products and devices of common interest. The primary goals of the program are to provide cost-effective evaluations for the states by eliminating duplication of routine testing by the states; and to reduce duplication of effort by the manufacturers who produce and market commonly used proprietary, engineered products." **NTPEP**

-- Rick Smutzer (IN), former NTPEP Chairman

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