The Ultimate Stress Absorbing Membrane presented by
INTRODUCTION

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FiberMat®
Pavements deteriorate from the day they are put to use.
We can enhance the function by designing quality pavement layers.
However reflective cracking is still prevalent.
We know that geo-textile treatments reduce reflective cracking.
Adding to the problem

Today's Airport Professionals have an enormous responsibility
An average of 1.5 million people fly in the United States each day
Greenville/Spartanburg serviced over 1.25 million passengers in 2009
Planning for a passenger level of 5.3 million passengers by the year 2023
Greenville/Spartanburg International Airport continued improvements

Looking for innovative and cost saving Ideas

Continued growth in its future
New and innovative thinking is required to stretch the limited dollars available.

Airport and DOT professionals are making Business decisions when it comes to Investing Public Funds.

Asset Management
The New Approach

- Transportation Networks Viewed as Utilities
- Investments in Assets Rather than the Traditional Public Idea of Mere Expenditures of Funds
Figure 1.2. Typical Variation in Pavement Conditions as a Function of Time (modified after reference 4)
• Road Condition
  – Base is structurally sound
  – Road has good edge drainage
  – Road surface is starting to crack and allow water intrusion into the sub base.
WHAT PROCESS TO USE?

The right treatment at the right time on the right road.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Pavement Condition</th>
<th>Cracking</th>
<th>Climate</th>
<th>Traffic Volumes</th>
<th>Parameters</th>
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<tbody>
<tr>
<td></td>
<td>Rutting</td>
<td>Alligator B</td>
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<td>Raveling</td>
<td>Oxidation</td>
<td>Blending</td>
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<td>10 to 20%</td>
<td>20 to 30%</td>
<td>Longitudinal</td>
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<td>Transverse</td>
<td>Desert</td>
<td>Valleys</td>
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<td>Coastal</td>
<td>Mountains</td>
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<td>ADT&lt;5000</td>
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<td>ADT 500-3000</td>
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<td>ADT&gt;3000</td>
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<td>NightCold</td>
<td>Stop Points</td>
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<td>Urban</td>
<td>Rural</td>
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<td>High Snow Plow</td>
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<td>Fuel Tax</td>
<td>Per Lane Mile</td>
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<td>Note:</td>
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<td>1. Generally used on shoulders, low volume roads, and parking areas. Should not be placed on traveled way by contract until further notice.</td>
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<td>2. Generally used on shoulders, parking areas, and locations where a less aggressive surface texture is desired.</td>
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</table>
REFLECTIVE CRACKS

- Fog seals, Slurry Seals and Chip Seals water proof the road as long as the emulsion membrane is not compromised.
- Reflective cracks quickly propagate through the surface treatment defeating the purpose
FIBERMAT®

Emulsion
Glass Fibers
Emulsion

Type A
Wearing Surface
Aggregate

Type B
Interlayer
HISTORY

- Developed in the UK
- Used as a **SAMI** and **Wearing Course**
- Used in traditional chip seal, decorative finishes, bridge decks, textile and grid markets
FiberMat® was designed to:

- Enhance tensile strength and reduce reflective cracking.
- Quickly applied and more easily shaped.
- Has great wearing as well as tensile properties.
- Used at various levels in the pavement structure.
- RECYCLABLE
FIBERMAT® PROCESS
Combine Emulsion with Glass Fibers

Asphalt Emulsions = the waterproof membrane
Glass Fiber Strands = the ability to withstand stresses and give enhanced tensile properties
• CRS-1p or CRS-2p
• Anionic have been used
• Must be modified
• Tighter specs than ASTM – good practice
AGGREGATES

- VARIOUS STONE SIZES USED
- ¼ TO ½ INCH MOST COMMON
- LOCAL SPECIFICATIONS FOR CHIP SEALS
- TAKE CARE WITH THE % OF P200
Rolling and sweeping completes the treatment. The surface can normally be opened to traffic within 15 minutes.

**TYPE A**

The finish produced is a skid-resistant wearing surface – **SAM (Stress Absorbing Membrane)**

**TYPE B**

This can then be used as a **SAMI (Stress Absorbing Membrane Interlayer)**, overlaid with a different wearing course such as HMA, NovaChip or Microsurfacing
FIBERMAT® TYPE A & B

**Type A**
- Polymer Modified Asphalt Emulsion
  - 0.4 – 0.6 gal/sy
- Fiberglass
  - 2 - 3 oz/sy
- Aggregate
  - 17 – 25 lbs/sy
  - ½”, 3/8” or ¼” and combination

**Type B**
- Polymer Modified Asphalt Emulsion
  - 0.35 – 0.45 gal/sy
- Fiberglass
  - 3 - 4 oz/sy
- Aggregate
  - 10 – 15 lbs/sy
  - ¼” blinding aggregate
MACHINE HISTORY

Mini-Machine
4 foot wide unit used in the UK.

Truck mounted 8 foot wide unit
MACHINE HISTORY

Trailer mounted unit is 13 foot wide
Computer Controls
Regulate production on the fly
Manage width in one foot increments
FIBERMAT® MACHINE

Easy to work on with folding bars

2nd Spray bar

1st Spray bar

Cutting Units

Underside of application unit
FIBERMAT® MACHINE

- Chopping Unit Close Up

Red roller knife shears fiberglass strands
FIBER STORAGE

Pallets of fiberglass packaged in cardboard tubes

Enough for 40,000 sq yds without recharging
HOW IS IT APPLIED

Glass fibers

1st layer of Emulsion

2nd layer of Emulsion

Cut glass fibers

Cutting wheels

Feed line
Typical application speed is 220 - 260 ft /min
QUICKLY APPLIED AND SHAPED

EASILY

Adjusts to your job site
• Nottingham university, UK
• Ulster university, Ireland
• Lcpc, Autun, France
• New South Wales road transportation authority, Australia
• Rilem - 1996
• World congress on emulsions October 2006
• Penn State – PTI report on Fibermat type b March 2007
• Texas A&M – TTI report on Fibermat type b Oct 2007
• Ctaa – Niagara Falls, on November 2007
• Rilem Chicago, IL June 2008
EXECUTIVE SUMMARY

Texas A & M Report

Pennsylvania State Report
PENN SYLVANIA TRANS. INST. & PENN STATE TEST TRACK

FiberMat® Type B

HMA Overlay
Cracked HMA
Base
FiberMat Section

SS1H tack

HMA Overlay
Cracked HMA
Base
Control Section
• Horizontal crack propagation along the FiberMat® interface rather than by cracking vertically above as in control samples.

• Generally, specimens containing FiberMat® improved cracking resistance in the small overlay testers 3 to 4 times more than control samples. The large overlay FiberMat® samples survived 14 times more compared to the control.
FIBERMAT® TYPE A – FIELD TEST
Groth Road in Murray, New York

FIBERMAT® TYPE A
CRS-2p
FIBERMAT® TYPE A
CRS-2p

March 2004
LONGITUDINAL CRACKS REAPPEARED AFTER 6 MONTHS

January 2005
SNOW PLOW DAMAGE AFTER 2ND WINTER
FIBERMAT® TYPE A – FIELD TEST
Groth Road in Murray, New York

January 2006
FURTHER SNOW PLOW DAMAGE & WATER PUMPING AFTER 3RD WINTER

January 2007
DAMAGE CONTINUED NOW WATER IS PUMPING FROM SUBBASE

June 2008
REPAIRS NEEDED IN ORDER TO MAINTAIN PUBLIC SAFETY
FIBERMAT® TYPE A – FIELD TEST
Groth Road in Murray, New York

October 2009
RULE OF THUMB

For every one inch of HMA you get one years delay in reflective cracking.

What if you could get three, four or even five years delay in reflective cracking?
WHAT IF?

What if you could maintain the water proofing characteristics of your surface treatments three, four or five years longer?
BENEFITS TO CUSTOMER

Public Safety

Speed and efficiency of application
- Initial construction speed minimizes lane closure
- Open to traffic quickly minimizing disruption to the public

Improved surface friction characteristics
- Safer driving conditions in good and bad weather

Waterproofs surface preventing damage to sub base
- Maintains ride quality longer
- Maintains safe driving surface (slow pothole development)

Improves Customer relations
- Reduces public complaints due to poor road conditions
- Great First Impression
Cost Effectiveness

Speed and efficiency of application
- Lower labour costs vs. competitive products
- Speed of process reduces crew & equipment costs on road
- Reduces exposure to potential liability

Waterproof surface preventing damage to sub base
- Extends pavement life
- Maintains ride quality longer
- Maintains safe driving surface (slow pothole development)

Slows propagation of reflective cracks
- Extends pavement life
- Extends life of overlay surface treatment
- Maintains waterproofing characteristics for longer life
The Ultimate Stress Absorbing Membrane

The Right treatment, to the Right road at the Right time