Fiber Reinforced Chip Seals

François CHAIGNON
COLAS Inc.

Breakdown of COLAS Group activity
in millions of €

Roads: 7,158 (66.8%)
Building materials: 1,477 (13.8%)

Civil engineering, Pipes, Mains: 2,082 (19.4%)

Safety Signage, Warehouses, Building: 2,082 (19.4%)

Waterproofing, Railway: 2,082 (19.4%)

HISTORY
- Developed first in the UK
- Used as chip seals and SAMI
- Used in traditional chip seal and also for decorative finishes, bridge decks, textile and grid markets
US FIBERMAT HISTORY

2003
2005
2006
2002

4 year history

2007 NORTH AMERICA FIBERMAT MACHINES

Midland: 2
Strawser: 1
Terry: 1
Colaska: 1
Gorman: 1
All States: 1
Sully-Miller

FIBERMAT in the US:
TRIED AND TESTED

> 7 STATES
> 3 MSY
> 4-5 YEAR NA HISTORY
> 7 MACHINES IN 2007
> PTI, TTI AND WORLD CONGRESS ON EMULSIONS
> TRIED AND TESTED

FIBERMAT
THE PROCESS

- Designed to be quickly applied and more easily shaped
- Designed to reduce reflective and alligator cracking
- Designed to be used at various levels in the pavement structure

A uniform, consistent binder layer is produced. A polymer-modified emulsion is applied with two layers typically 0.4 - 0.5 Gal/SY. Fiber glass is cut between the layers at 2-5 Oz/SY.

FIBERMAT A vs FIBERMAT B

FIBERMAT

FIBERMAT TYPE A
GROTH ROAD, TOWN OF MURRAY, ORLEANS CO, NY

Longitudinal cracks reappeared after 6 months in March 2004.

January 2005:
Snow plow damage after 2nd winter.

January 2006:
Further snow plow damage & water pumping after 3rd winter.

FIBERMAT B
Same application method as A

FiberMat Membrane 3-4oz Fiberglass per SY d
1. Now up to 13'4” wide in a single pass

2. Stores 4 pallets of fiberglass that feed automatically which allows 45,000-75,000 SY before reload

3. Easy to work on with folding bars.
THE PERFORMANCE
Laboratory evaluations over 15 years
Usage in four countries with consistent findings
Major on-site evaluation study in Australia through the 1990’s
Study ongoing with Penn State Univ. & Texas A&M
Presented at the World Congress on Emulsions
Further work ongoing

LABORATORY EVALUATION
Tensile Test Programs.

Fatigue Test Programs.

Wheel-Track Cracking Test Program.
All programs used various treatment combinations.

LABORATORY EVALUATION
Fatigue programs showed the development of horizontal micro-cracks in the base of test specimens.

PENNSYLVANIA TRANSPORTATION INST. TEST SECTIONS – PENN STATE

Fatigue programs showed the development of horizontal micro-cracks in the base of test specimens.

Large Vertical Crack in Control sample
• Three modes -
  – 1. TTI Overlay Tester Data output
  – 2. Fracture mechanics modelization; predicted “cracking” life.
  – 3. Test section / Model validation.

PERFORMANCE SUMMARY

- Increased tensile strength (+30%)
- Good fatigue performance (+30%)
- Good resistance to wheel track cracking (+300%)
- The product can be opened to traffic
- The binder layer provides waterproofing properties
- The product provides a good surface on which to apply asphalt layers

PRESERVATION WITH FIBERMAT
"Long-term strategy that enhances pavement performance by using an integrated cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations."

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

CONCLUSION

FIBERMAT – REDUCTION IN REFLECTIVE AND ALLIGATOR CRACK PROPAGATION.

FIBERMAT – AN EVER EXPANDING PROCESS.

FIBERMAT – PERFORMANCE IN THE FIELD AND THE LAB.

FIBERMAT & PAVEMENT PRESERVATION ARE HIGH ON THE AGENDA.

FIBERMAT A PERFECT FIT IN PAVEMENT PRESERVATION & ASSET MANAGEMENT.
QUESTIONS???