

Pavement Preservation with Microsurfacing & Chip Seal



Microsurfacing Definition

Laboratory designed mixture of polymer modified asphalt emulsion, aggregate, mineral filler, water and other additives accurately proportioned, mixed and uniformly spread over a properly prepared surface.



Governing Specifications

Microsurfacing

ISSA A 143

ASTM D 3910

FAA P-635

State DOT's and Local Specifications



Two Primary Uses

- **Preventive Maintenance**
 - To prevent surface distresses in good pavements
- **Corrective Maintenance**
 - To correct surface distresses in older pavements



Capabilities Microsurfacing

- Seals the surface (prevents further weathering of the underlying pavement)
- Restores surface texture
- Provides new wearing surface
- Fills cracks and voids
- Corrects other distresses
 - Leveling Course
 - Rut Filling



Component Materials

Microsurfacing Aggregate

- The aggregate shall be a manufactured crushed stone such as granite, slag, limestone, chat or other high-quality aggregate or combination thereof.
- Meet project specifications
- Consistent within specification

Microsurfacing Emulsion

- Polymer Modified Emulsified Asphalt (CSS-1HP)
 - Modified with Natural Latex or Synthetic polymers

Mineral Filler

- Portland Cement, Hydrated Lime or Aluminum Sulfate
- Water
- Additives (for break control)



Mix Design Procedure

- Mix Design Request
- Individual Component Analysis
- Initial Mix Trials
- Proportion Optimization
- Performance Testing
- Final Formulation Adjustments



Surface Preparation

Crack Sealing

Patching

Protection of Utilities

Blowing

Sweeping



How is it applied

?



Application Equipment

Truck Mounted Unit

Continuous Run Machine

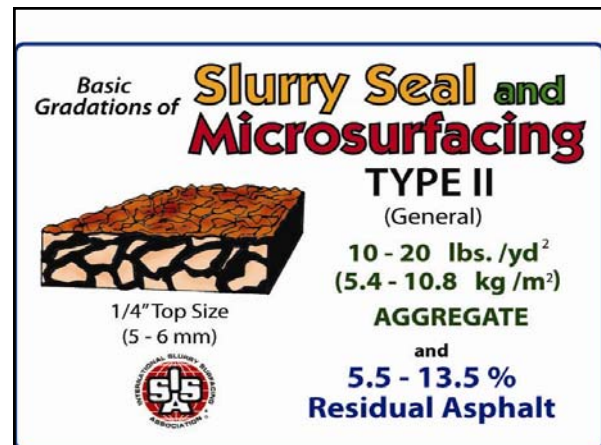


Truck Mounted Unit



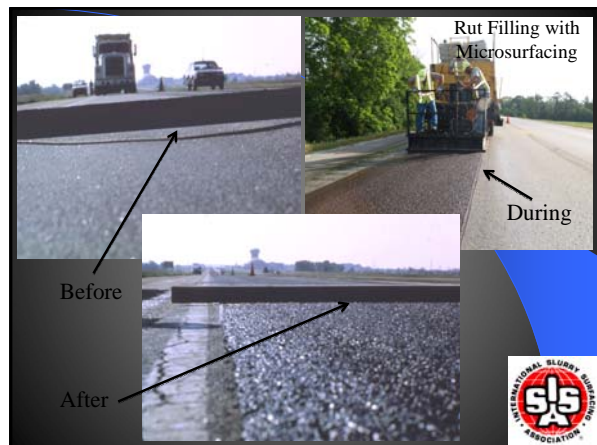
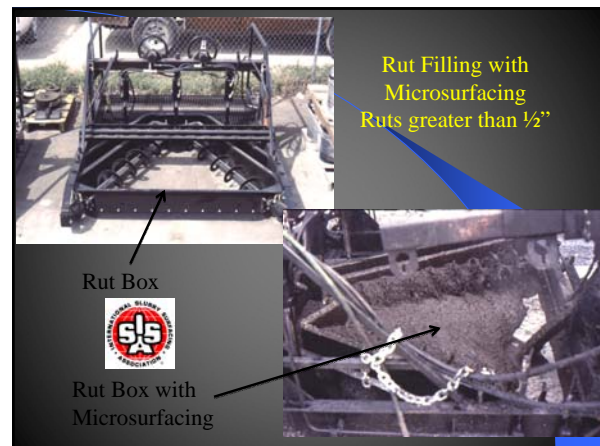
Continuous Machine





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A Chip Seal is...

- application of an asphalt binder to a roadway surface followed by application of aggregate which is then rolled & swept prior to returning the roadway to service



A good chip seal can...

- Provide all-weather surface
- Protect the underlying pavement
- Waterproof the road's surface
- Seal small cracks
- Improve surface friction
- Extend service life
- Improve safety
 - By improving skid resistance



Where can Chip Seals be Applied

- Over prepared base
- Two lane rural roads
- Secondary Highways & Routes
- Interstate Highways
 - requires site specific materials & applications
 - depends on Agency tolerance level.



How is it applied



Asphalt Distributer

Then

Now



Asphalt Distributer





Chip Seal Binder Variations

- Hot Tire Rubber
- Hot Asphalt Cement
- Conventional Asphalt emulsions
- Polymer Modified Emulsions
- Rejuvenating Emulsions
- Cutbacks

Aggregates Natural & Synthetic

- Crushed gravel
- Crushed stone
- Limestone
- Basalt (Trap Rock)
- Expanded Clay & Shale (lightweight)

Chip Seal quality depends on

- Site Selection
- Project Specific Design Factor
- Condition of surface
- Quality materials (consistency)
 - Clean Aggregate
- Well maintained equipment
- Contractor performance
- Application technique
- Traffic control
- Weather (avoid cool weather applications)
 - seasonal limitations apply



Chip Seal quality con't

- Timely, quality prep work (90-180 days ahead)
- Project specific specifications (Understand that plans are only a guide and that each road requires special considerations)
- Inspect surface (day of application) to determine rates and make knowledgeable adjustments in the field.
- Utilize variable rate spray bars and modified emulsions/asphalts on higher volume roadways
- Timely application of asphalt and aggregate to optimize aggregate embedment
- Re-visit your jobs from previous years to learn what works and what did not.





Average Cost of Maintenance

- | | |
|------------------------------------|----------------------------|
| • 1 1/2" HMA | \$95,000.00 - \$103,500.00 |
| • Milling - Less than 3" | \$23,500.00 - \$40,000.00 |
| • Fog Seal (conventional) | \$4,500.00 - \$5,500.00 |
| • Fog Seal (rejuvenating emulsion) | \$7,000.00 - \$8,000.00 |
| • Slurry Seal | \$19,500.00 - \$23,500.00 |
| • Micro Surfacing (single) | \$24,000.00 - \$27,000.00 |
| • Micro Surfacing (double) | \$48,000.00 - \$54,000.00 |
| • Chip Seal | \$18,000.00 - \$25,000.00 |
| • Poly-Con (materials only) | \$70,000.00 - \$90,000.00 |

Per mile 20' wide

Summary

Microsurfacing & Chip Seals are Excellent Pavement Preservation Tools

Sources of Information

International Slurry Surfacing Association

www.slurry.org

Asphalt Emulsion Manufacturers Association

WWW.AEMA.org

FP2, Inc.

National Center for Pavement Preservation

www.vancebrothers.com



Questions

Thank You!

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