Innovation, Modified Pavement Preservation Systems

WRAPP – 2018 Pavement Preservation Workshop
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Ergon Asphalt & Emulsions
Modification

Modified Pavement Preservation Systems **MAY** include any combination of the following:

– Polymer – Solid, Latex
– Rubber – Wet process, terminal blend, dry addition
– Clay Fillers
Polymer in Asphalt and Emulsions

- Polymerized asphalt is strong, tough and elastic
- It resists deformation at high temperatures and cracking at low temperatures
- Prior to the use of polymer, hot mix was made with AC graded asphalt. Rutting and Cracking were serious issues for these roads.
- With the addition of polymers (and changes to HMA design) rutting and cracking declined significantly.
- Polymers are routinely used in emulsions of all kinds.
Rubber in Asphalt and Emulsions

- Rubber can be added in a variety of methods (mainly wet process or terminal blend)
- Percentage depends on the product
- Can be added with or without polymers
- Particle size matters
Agenda - Treatments

• Fog Seals
• Chip Seals
• Scrub Seals
• Slurry & Micro Surfacing
Fog Seals
Attributes

- Prevent raveling
- Seal small cracks and surface voids
- Waterproof
- Improve aesthetics
Advanced Modification

• Durability
• Crack reflection
• Variety of Modifiers
• Longer service life
• Skid resistance issues
Chip Seals
Attributes

**Emulsion**
- Uncoated Chip
- Lower residual asphalt
- Cooler Temp for application
- Fast return to traffic
- May contain rubber and/or polymer

**Hot Applied**
- Precoated Chips
- Higher residual asphalt
- Warm Temp for application
- Faster return to traffic
- May contain rubber and/or polymer
Advanced Modification

• Durability
• Toughness
• Chip Retention
• Emulsion (quicker return to traffic)
Scrub Seals

- Mass Crack Fill (Penetrates & Bridges Cracks)
- Rejuvenation
- Intermediary layer or final surface treatment
- Different surface textures with sand and chip
Advanced Modification

- Less likely to bleed
- Stronger grip on chip
- More durable/Tougher
Slurry and Micro Surfacing
Attributes

Slurry
• 12-16 lbs./yd$^2$
• Slower return to traffic
• Day work
• Normal box possible
• No rut filling
• May contain polymer and/or rubber
• Fiber

Micro Surfacing
• 20-30 lbs./yd$^2$
• Quicker return to traffic
• Night work
• Auger, rut filling boxes
• Rut filling, multilayer stacking
• Must contain polymer and can contain rubber
• Fiber
Advanced Modification

- Tougher
- More resistant to garbage trucks and snow plows
- Allow for more asphalt in the mix
- Increased service life
- Reduction in raveling
Cantabro Results

**Table 1: Cantabro Testing**

<table>
<thead>
<tr>
<th>Type A (2) Aggregate</th>
<th>Conventional</th>
<th>HiMA</th>
<th>w/ Fiberglass Fibers</th>
<th>w/ MicroTekk</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>3.34</td>
<td>0.85</td>
<td>3.31</td>
<td>2.02</td>
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<tr>
<td>Test 2</td>
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<td>0.62</td>
<td>2.66</td>
<td>2.31</td>
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<tr>
<td>Test 3</td>
<td>3.77</td>
<td>0.74</td>
<td>2.71</td>
<td>2.80</td>
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<td>Test Avg</td>
<td>3.79</td>
<td>0.74</td>
<td>2.89</td>
<td>2.38</td>
</tr>
</tbody>
</table>

**Figure 1: Cantabro Testing**

Durability Testing by the Cantabro Test

Average of 3 data points

![Bar chart showing durability testing results](chart.png)
Highly Modified “Truck” Test
Summary

• There are continually new pavement preservation material improvements
• Not all advancements are created equal
• Check with agencies that have used the new treatment/material
• Ask for data
• Try it on the right pavement
• You get what you inspect
• Don’t be afraid of new innovations
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