Warm Mix Asphalt: Demonstration
Yellowstone National Park

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What is Warm Mix Asphalt?

• Hot Mix Asphalt 275-325°F
• Cold Mix Asphalt 60°F
• Warm Mix Asphalt 250-275°F

Project Details

• 6.93 Miles
• Evaluated 2 technologies
  – Advera (formerly Aspha-Min)
  – Sasobit
• 31,000 tons of mix total
  – 1/3 of the tonnage per mixture
Paving Details

- Binder Type – PG 58-34
- Placed in two 2” lifts
- Conventional Mix Temperature ≈ 325°F
- Placement Temperature ≈ 315°F
- 90 minute one way haul
- 7 vibe passes Ingersoll Rand DD-130
- 3 finish passes Ingersoll Rand SD-77
- Paving started August 21, 2007
Advera Admixture

- Synthetic Zeolite product
- Added at a rate of 0.3% by weight of mix
- Blown in at the plant — Under binder
- Initial mix temp = 275°F
- Eventual mix temp = 250°F
- Same roller pattern
- Started paving August 26, 2007
Sasobit Admixture

- Paraffin wax additive
- Added at a rate of 1.5% by weight of binder
- Blown in at the plant—Under binder
- Used same port as Advera
- Initial mix temp: 225°F
- Eventual mix temp: 245°F
- Same roller pattern
- Started paving August 30, 2007
<table>
<thead>
<tr>
<th>Property</th>
<th>No Additive</th>
<th>1.5% Sasobit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotational Vis, Pa</td>
<td>3.535</td>
<td>0.480</td>
</tr>
<tr>
<td>Mass change, %</td>
<td>-0.387</td>
<td>-0.364</td>
</tr>
<tr>
<td>DSR Original, kPa</td>
<td>1.316</td>
<td>2.468</td>
</tr>
<tr>
<td>DSR RTFO, kPa</td>
<td>2.551</td>
<td>4.719</td>
</tr>
<tr>
<td>DSR PW, kPa</td>
<td>1.101</td>
<td>1.917</td>
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<tr>
<td>BBR Stiffness</td>
<td>265</td>
<td>287</td>
</tr>
<tr>
<td>BBR m-Value</td>
<td>0.313</td>
<td>0.275</td>
</tr>
</tbody>
</table>
What Have We Learned

- Field density achieved in all cases
- Saved ≈ 20% in fuel at the plant
- Temperature at plant hard to regulate
- Mix handled similarly
- Workers noted no handling difficulties
- No smoke
- Additives don't seem to affect mix design
- Sasobit stiffens binder

What’s Next

- More testing
  - Volumetrics
  - Recovered asphalt properties
  - TSR
  - Rut (Hamburg and APA)
  - Western Research Institute (WRI)
- Field monitor
- FHWA Field Lab data / report