What’s Happening with Asphalt in 2019

Dennis Hunt, Gencor Industries, Inc.
ribbons of velvet smoothness
What to put in Asphalt Concrete?

• Everything but the kitchen sink
What to put in Asphalt Concrete?
What to put in Asphalt Concrete?
Global Warming now Climate Change
Examining How Federal Infrastructure Policy Could Help Mitigate and Adapt to Climate Change

• On Feb. 26, the Transportation and Infrastructure (T&I) Committee held a hearing titled “Examining How Federal Infrastructure Policy Could Help Mitigate and Adapt to Climate Change.”

• In early January, the NAPA Government Affairs team met with Rep. Peter DeFazio (D-Ore.), Chairman of the House T&I Committee, to discuss FAST Act reauthorization priorities. During the meeting, DeFazio asked what the asphalt pavement industry is doing to reduce its carbon footprint.
Check List

• Plant maintenance
  – Written schedule
  – Daily inspection
  – Keep records
  – Proper greasing
Reduce our Carbon Footprint

• Reduce greenhouse gases
  – Keep the burner tuned
  – Natural Gas, Propane, LNG
  – Warm mix
  – More RAP
  – RAS

• Remember asphalt pavements have lower a carbon footprint than PCC
Teach and Train

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Smarter Plant

• Silo Radar level indicators
• AC Tank Pressure transducers
• Continue to advance plant automation
Control of Temperature

- Production
- Storage
- Transportation
- Placement
- Compaction
Flue Gasses

High CO but Low NOx

Low CO but High NOx

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## Aggregate Temperature

Temperature virgin aggregate

<table>
<thead>
<tr>
<th>Moisture</th>
<th>10% RAP</th>
<th>40% RAP</th>
<th>50% RAP</th>
<th>60% RAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>330</td>
<td>482</td>
<td>574</td>
<td>710</td>
</tr>
<tr>
<td>1%</td>
<td>337</td>
<td>523</td>
<td>634</td>
<td>801</td>
</tr>
<tr>
<td>2%</td>
<td>344</td>
<td>563</td>
<td>695</td>
<td>892</td>
</tr>
<tr>
<td>3%</td>
<td>351</td>
<td>604</td>
<td>756</td>
<td>983</td>
</tr>
<tr>
<td>4%</td>
<td>357</td>
<td>644</td>
<td>816</td>
<td>1074</td>
</tr>
<tr>
<td>5%</td>
<td>364</td>
<td>685</td>
<td>877</td>
<td>1165</td>
</tr>
</tbody>
</table>

Assumptions: Final mix temperature 300° F, Virgin aggregate 5% moisture
Plant Survey

- Combustion efficiency
- Exhaust system efficiency
- Drying efficiency
- Thermal efficiency
- Operational efficiency
Common Results

- Most plants’ burners need to be adjusted
- Most plants do not regularly check fuel viscosity
- Most plants have air leaks
- Most plants need dryer flighting adjustments
- Most plants’ trunnions are not properly adjusted
- Most plants could improve their maintenance practices

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Common Results

• It’s 2019 – How are you doing?
Flue Gas Meter

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## Combustion Draft/Flue Gasses

<table>
<thead>
<tr>
<th>Test points</th>
<th>Carbon monoxide (CO) corrected to 7% O&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum puffing</td>
<td></td>
</tr>
<tr>
<td>Baghouse outlet</td>
<td>1443 ppm</td>
</tr>
<tr>
<td>Damper open</td>
<td></td>
</tr>
<tr>
<td>Baghouse outlet</td>
<td>445 ppm</td>
</tr>
</tbody>
</table>

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## CO Corrected to 7% O²

<table>
<thead>
<tr>
<th>Plant</th>
<th>O²</th>
<th>CO-ppm (uncorrected)</th>
<th>CO corrected to 7% O² (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant 1</td>
<td>7.3%</td>
<td>69</td>
<td>71</td>
</tr>
<tr>
<td>Plant 2</td>
<td>11.6%</td>
<td>93</td>
<td>143</td>
</tr>
<tr>
<td>Plant 3</td>
<td>8.8%</td>
<td>114</td>
<td>131</td>
</tr>
<tr>
<td>Plant 4</td>
<td>9.6%</td>
<td>162</td>
<td>199</td>
</tr>
<tr>
<td>Plant 5</td>
<td>10.4%</td>
<td>374</td>
<td>495</td>
</tr>
<tr>
<td>Plant 6</td>
<td>10.9%</td>
<td>951</td>
<td>1322</td>
</tr>
<tr>
<td>Plant 7</td>
<td>12.4%</td>
<td>1222</td>
<td>1998</td>
</tr>
<tr>
<td>Plant 8</td>
<td>12.4%</td>
<td>1495</td>
<td>2445</td>
</tr>
<tr>
<td>Plant 9</td>
<td>10.2%</td>
<td>3076</td>
<td>3996</td>
</tr>
</tbody>
</table>

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Fuel Viscosity

- Proper viscosity critical to complete combustion
- Check fuel viscosity on a regular basis
- Generally the viscosity of every load of fuel is different
- Improper fuel viscosity causes inefficiencies
# Causes of High CO

<table>
<thead>
<tr>
<th>Plant</th>
<th>Fuel Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant 1</td>
<td>189°F</td>
</tr>
<tr>
<td>Plant 2</td>
<td>178°F</td>
</tr>
<tr>
<td>Plant 3</td>
<td>160°F</td>
</tr>
<tr>
<td>Plant 4</td>
<td>154°F</td>
</tr>
<tr>
<td>Plant 5</td>
<td>153°F</td>
</tr>
<tr>
<td>Plant 6</td>
<td>145°F</td>
</tr>
<tr>
<td>Plant 7</td>
<td>126°F</td>
</tr>
<tr>
<td>Plant 8</td>
<td>120°F</td>
</tr>
<tr>
<td>Plant 9</td>
<td>120°F</td>
</tr>
</tbody>
</table>

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# Fuel Viscosity

<table>
<thead>
<tr>
<th>Fuel temperature</th>
<th>Carbon monoxide (CO) (at exhaust fan) Corrected to 7% O²</th>
</tr>
</thead>
<tbody>
<tr>
<td>114°F</td>
<td>2401 ppm</td>
</tr>
<tr>
<td>150°F</td>
<td>1174 ppm</td>
</tr>
</tbody>
</table>
Leakage Air

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# Leakage Air

## Inches Water - Negative Pressure

<table>
<thead>
<tr>
<th>Square Inches Open</th>
<th>0.5</th>
<th>1.0</th>
<th>1.5</th>
<th>2.0</th>
<th>3.0</th>
<th>4.0</th>
<th>5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>957</td>
<td>1354</td>
<td>1658</td>
<td>1915</td>
<td>2345</td>
<td>2708</td>
<td>3028</td>
</tr>
<tr>
<td>100</td>
<td>1915</td>
<td>2700</td>
<td>3317</td>
<td>3830</td>
<td>4690</td>
<td>5416</td>
<td>6055</td>
</tr>
<tr>
<td>150</td>
<td>2872</td>
<td>4062</td>
<td>4975</td>
<td>5745</td>
<td>7035</td>
<td>8124</td>
<td>9083</td>
</tr>
<tr>
<td>200</td>
<td>3829</td>
<td>5416</td>
<td>6633</td>
<td>7660</td>
<td>9380</td>
<td>10830</td>
<td>12110</td>
</tr>
</tbody>
</table>

Air in Leakage - 60F Ambient - 300F Stack Temperature
ACFM at Exhaust Fan
Veil in drum

151°F

263°F
Veil in drum

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Moisture The Production Killer

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Moisture The Production Killer

Rules of thumb

Product rate will change 13% +/- with a 1% moisture change
To maintain the same production rate with a 1% moisture content change, BTU’s will need to increase 24,000 for each ton of production

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End of run discharge samples taken to show crew how to check gradation and adjust plant timing accordingly to minimize waste.
Optimizing Plant Production

- Consistency is the goal in aggregate moisture and gradations, plant operation, air flow, mix temperature, truck loading and maintenance.

- Flawed operation in one area will adversely affect another.

- Never be satisfied with your productivity as it is....

- Quality – Quality – Quality – Quality – Quality

- Look beyond your normal routine for the endless opportunities of increasing production and decreasing operating costs.

- Safety
Driving Maintenance Efficiencies

- Train
- Plan
- Organize
- Look
- Listen
- Report
- Correct
Proper Tools
Proper Tools

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Spare Parts
Daily Plant Inspection

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50% of all bearing failures caused by lubrication
- Insufficient lubrication
- Excessive lubrication
- Contamination
Bearing Failure

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Bearing Failure
Quality

THE PRICELESS INGREDIENT IN EVERY OUNCE OF INDUSTRIAL ASPHALT MIX ... THE PRIME REASON WE ARE THE RECOGNIZED LEADER IN OUR FIELD!
Thank You

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