PRODUCERS PERSPECTIVE ON WMA PRODUCTION AND PLACEMENT

2nd International Warm-mix Asphalt Conference
October 13, 2011
Please Note:

It is not the intent of this presentation to recommend, promote, or endorse any particular WMA Technology.
Oldcastle Materials Group

Materials

- Aggregates
- Ready-mix Concrete
- Asphalt

No. 3 Aggregates
Top 5 Ready-mix Concrete
No. 1 Asphalt
Oldcastle Materials Group – Asphalt Facilities

- 415 plants operated in 2010 and produced ~42 million tons
  - Drum – 296 plants
  - Batch – 119 plants
OMG Commitment to WMA

- OMG has 127 plants equipped with WMA foaming equipment
  - 126 Drum Plants, 1 Batch Plant
- Use of additives when appropriate
- OMG WMA production by year:
  - 2007 – 0.017 million tons
  - 2008 – 0.3 million tons
  - 2009 – 1.4 million tons
  - 2010 – 5.8 million tons
  - Goal for 2011 – 10 million tons
- Transition to WMA
  - Issues of working with agencies and private customers
    - Be smart- reasonable expectations
Know the limits of technology…
OMG WMA Performance 2010

WMA Production in 2010 ~5.8 million tons
OMG installed 107 plants with mechanical foaming equipment WMA in 2010
WMA’s Value to Industry

• OMG believes WMA will become the standard of the industry over time, and will allow greater percentages of RAP than ever before
  • Timeline of progress suggests revolution of WMA has occurred, and evolution of process is underway
  • Benefits of energy savings, better field compaction, the ability to haul paving mix for longer distances, and the ability to extend the paving season will help drive WMA implementation
  • The environmental benefits of WMA should be considered equally as important to the “technical benefits” in driving WMA implementation
    • Participation in the LEED system as an Innovation and Design Process or “other” green pavement program
Factors Driving OMG use of WMA

• Reduction in Worker Exposure to asphalt fume and aerosol
  • Health concern
  • Neighbor concern
• The environment and sustainable development concerns, so called “Green Construction”
  • Reduction in energy consumption
  • Reduction in greenhouse gas emissions
• Competitiveness
  • Expanded / enhanced use of RAP and RAS
  • Extending haul distances
  • Extension of paving season
• OMG expects that each of these factors can be leveraged in the markets we supply
Higher RAP % Using Warm Mix Technology

- WMA facilitates mixing/coating & compaction of high RAP mixtures
  - Successful field trials, up to 50% RAP
- No reported mix or construction problems
- Agency education & specs needed
- Research
  - Strength development & performance
  - AC quality & dispersion
WMA Technologies Available Today

- LEA-CO
- Eco-Foam II
- Rediset WMX
- ECOBIT
- Sasobit
- Green Machine
- Evotherm
- CECABASE RT
- Qualitherm
- Advera
- Aquablack Warm Mix Asphalt System
- Accu-Shear Dual Warm-Mix Additive
- Terex Warm Mix Asphalt System
- Double Barrel Green System
- Tri-Mix Warm Mix Injection
- Hgrant Warm Mix System
- LEA Lite
- Meeker Warm Mix
- Shell Thiopave
- SonneWarmix
Warm-mix Asphalt Internal Review

- **Purpose**
  - Review performance of WMA equipment, projects, and provide guidance on the use of additives. Identify ways to increase the use of WMA in our markets with emphasis on FOB sales

  - **Review to include:**
    - Energy Savings
    - Lower emissions
    - Increased production
    - Decreased plant wear
    - Eliminate Anti-Strip
    - Increased effective binder content
    - Increased RAP
    - Longer hauls
    - Reduced thermal segregation
    - Cool weather paving
    - Reduced worker fatigue
    - Improved compaction
    - Quality Incentives
WMA Internal review or “summit”

Work Product

– Equipment performance ranking / maintenance concerns and procedures

– Guidance document reviewing the value opportunities WMA offers, specifically deal with when additives should be considered

– Tools to address concerns related to the use of WMA, potential marketing strategies
WMA Technologies used by OMG

- Foaming Equipment
  - Gencor Industries: 37
  - Astec Industries: 36 (17 / 19)
  - Maxam Equipment: 25
  - Meeker Equipment: 17
  - Terex Roadbuilding: 4
  - Herman Grant: 4
  - Stansteel: 2
  - Tarmac: 2

- Additives
  - Advera (Synthetic Zeolite)
  - Evotherm
  - LEA and LEA lite
  - Sasobit
  - Sonnewarmix

APAC FL – Tampa “Hulk Plant”
Various WMA Foaming Systems
How much water is used in Mechanical Foaming Processes?

- Like most things in life it all depends
  - Type of WMA equipment
  - Type of plant
  - In some cases the type of asphalt
  - In some cases preference based on experience

- OMG plants typically run between 1.25% and 2.2% water by weight of binder

- The better question is how much water is left in the mix?
  - Relatively small amounts of water remain after the initial flash off ~0.05%
What have we learned about foaming?

- More water may not improve the foaming
  - Not all asphalts foam the same
- In some cases excessive water may cause “gummy” mix
- It is important to control the water due to the small amount used
- It is a best fit process
  - Mix – Water – Plant
WMA Temperatures

- The correct temperature depends on many factors:
  - Mix type
  - Plant type
  - Additive or foaming device used
  - Distance hauled
  - Ambient conditions
- WMA is a “tool” and should be used to improve the pavement constructed
  - Set temperatures appropriate for the conditions at time of construction
Compaction

- Since the volume of the binder is increased, or coating improved, its lubrication is improved resulting in improved compactability.
- Testing performed in New York suggest reduced in-place density variability when WMA was used.
- Can rollers be removed from the paving train?
  - Over-rolling?
OMG Best Practices for WMA

Guidelines- “5- W’s”
Stockpiles
Burner
Baghouse/Flighting
Plant calibration
Silo Storage
Environmental regs
Customer education
OMG Brochure – Educating our Customers

- WMA: A New Technology for Sustainability
- Paving the Way for Green
  - Greener Construction
  - Recycling of Materials
  - Reduced Fuel Usage with WMA
  - Reduced Emissions
  - Paving Benefits
- Successful Application Using Warm-mix Technology
- Warm-mix Methods
- OMG Commitment to Cleaner and Greener
Additional Thoughts

- It's not a competition between HMA and WMA, it's all asphalt.
- WMA improves the quality of asphalt mixes.
- WMA is simply another tool to be used where appropriate.
- WMA temperatures may have to be adjusted to adapt to various production and mix conditions.
- Customer communication.
Remaining Challenges

- Changing the culture of paving crews and customers
  - Hotter is not always better
- Plant operational issues when both conventional and WMA are produced
- Dealing with possible low TSR results
- Compaction control
States with WMA Specifications

- The following states have adopted specifications which allow the use of WMA, many at the option of the contractor/producer:
  
  - Alabama
  - Arkansas
  - California
  - Colorado
  - Delaware
  - Florida
  - Iowa
  - Idaho
  - Indiana
  - Kansas
  - Kentucky
  - Louisiana
  - Maine
  - Maryland
  - Minnesota
  
  - Missouri
  - New Mexico
  - New York
  - North Carolina
  - Pennsylvania
  - Ohio
  - Oklahoma
  - Oregon
  - South Carolina
  - Tennessee
  - Texas
  - Virginia
  - Washington
  - West Virginia

Why aren’t all States embracing WMA technology?
WMA Path Forward

• Industry needs to continue to be proactive in the development and implementation of WMA technology
  • Advocate the development WMA specifications which allow the use of a broad range of WMA technologies to provide the producers with the ability to choose the technology which best suits their plant and application
Implementation Goals

WMA should be an acceptable alternative to conventional asphalt mixtures at the Contractor’s discretion, provided the WMA meets applicable specifications.
Advancing the “Ball”

• Warm-mix is a quickly maturing technology which can benefit everyone:
  • The Environment – makes asphalt mixes cleaner and greener
  • The Producers – keeps our industry competitive
  • The Contractor – improves the workability of mixes they work with
  • The Owners – improves the quality of pavements constructed

\textit{Let’s continue to research these technologies, but it is time to move aggressively forward with truly permissive specifications allowing the use of WMA on all projects}

• Industry needs to continue to develop this technology to maximize the environmental and economic benefits provided by WMA
  • Can we get to even lower temperatures?
  • Can we use WMA technologies to increase our ability to use RAP or RAS?
  • Can we develop new technologies to improve the economics of using additives?
  • Can we leverage the environmental benefits to make asphalt the preferred materials for pavement construction?
WMA Quality = Conventional Asphalt Quality
Can use existing asphalt plants with minor modifications
Can work with existing mixture designs
It’s time to use these technologies to best advantage