Advera® WMA Zeolite

District 5 Warm Mix Asphalt Innovation Project
Open House and WMA Workshop

PQ Corporation

Annette Smith
Phone: 610-651-4469
annette.smith@pqcorp.com
Overview

- Advera® WMA
  - What is it?
  - Who manufactures and markets?
  - How does it work?
  - Features and Benefits

PQ Corporation
Advera® WMA
What is Advera WMA?

- **Synthetic Zeolite**
  - **Hydrated Aluminosilicate**
  - **Contains 18-21% water**
  - **Standard size and quality for consistency.**
  - **Environmentally and Worker Friendly**
    - HMIS/NFPA Code 1, 0, 0
    - GRAS
Manufacturing of Advera WMA

- Manufactured and Marketed in North America by PQ Corporation
  - 176 Year old Global Company with Corporate headquarters in Malvern, PA.
  - World leader in silicate, zeolite and other high performance inorganic chemicals
  - Manufacture Zeolite in three plants in the USA. Jeffersonville, IN; Augusta, GA; and Kansas City, KS
Advera WMA
How does it work?

- Upon heating above 100 C, water is emitted from the zeolite structure causing micro-foaming in the asphalt concrete. (less than 1 lb of water)
  - Controlled foaming - No visual change in the asphalt concrete
  - Improves Workability, and thus compaction for overall improvement in density.
  - No chemical alteration to the bitumen or PG change.
Advera WMA

How does it work?
Time Release of Water

- DSC/TGA test run by Texas A&M
Advera WMA

- Added to Asphalt Concrete at a rate of 0.25% by weight of the mix. (5 lbs/ton)
- Available in Bulk Bags, Bulk Trucks, or Rail
How is it introduced?

- Drum plants, through a fiber port.
Advera WMA

How is it introduced?

- Batch Plant
  - Melt Bags
  - Feeder with Mix Tank
Advera WMA

- Bulk Bag Unloader
- Silo
Advera WMA

Features & Benefits

Better Workability of the Asphalt Mix Allows

- Longer Haul Times
- Paving in cooler weather
- Easier Handling of Stiff Mixes such as Polymer Modified, Rubber Asphalt Binder and high RAP.
Advera WMA

Features & Benefits

- Reduction in Production Temperatures Reduces Emissions
  - Reduce Blue Smoke complaints
  - Reduce Recordable Emissions
  - Increase in the tonnage through the plant.

- Reduction in Production Temperatures Reduces Energy Consumption
Reduction in Emissions

During Production – Ohio Demonstration

Stack Test Results – USEPA Protocol

- 83.1% < SO2
- 29.7% < NOX
- 62.8% < VOC’s
- 61.9% < CO

Mar-Zane Environmental Group
features & benefits

- Reduction in Temperature at the Paver
- Reduction in Fumes for the Paving Crew
- Reduction of Heat on already hot days.

Control
Temp = 320°F

WMA Temp = 245°F
Reduction in Emissions

Paver Test Results – NIOSH Method 5024

- 67% < TP Total Particulate (Asphalt Fume)
- 81% < BSM Benzene Soluble Matter

WMA’s < the NIOSH Recommended Limit of 5mg/m³

Certified Industrial Hygienist - EES Group
Mix Types

- Mix Design
  - Hveem
  - Marshall
  - Super Pave
  - Other

- PG Grades Used
  - PG 58 - 34 PM
  - PG 58 - 28
  - PG 64 - 22
  - PG 70 - 22
  - PG 70 - 22 PM
  - PG 76-10
  - PG 76 - 22
Advera® WMA

2007 Demonstrations

- California - HVS Test Site – 150 tons
- Colorado - Eisenhower Tunnel – 1,200 tons
  - Commercial – 2,000 tons
- Tennessee – Hillsboro Pike -1,200 tons
- Vermont – City Street – 450 Tons
- Wisconsin – Miller Park – 4,500 tons
- Wyoming - Yellowstone NP Entrance Rd – 9,000 Tons
Advera WMA Recap

- Compaction Aid for Stiffer Mixes
- Longer Haul Times
- Extension of the Paving Season/Cold Weather Paving
- Reduction in Production Temperatures Reduces Emissions
  - Reduce Blue Smoke complaints
  - Reduce Recordable Emissions
- Reduction in Production Temperatures Reduces Energy Consumption
- No Change in chemistry of the binder.
Questions?