

Advera[®] WMA Zeolite

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

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Overview

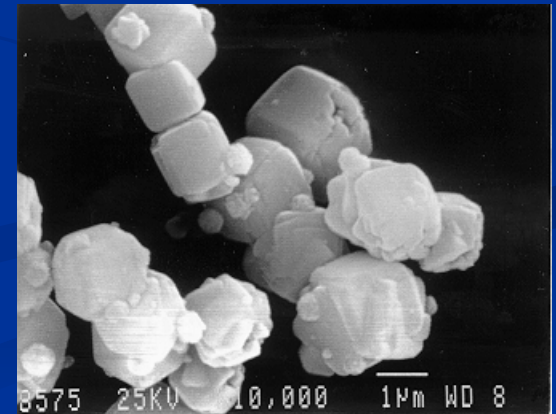
- Advera[®] WMA
 - What is it?
 - Who manufactures and markets?
 - How does it work?
 - Features and Benefits



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



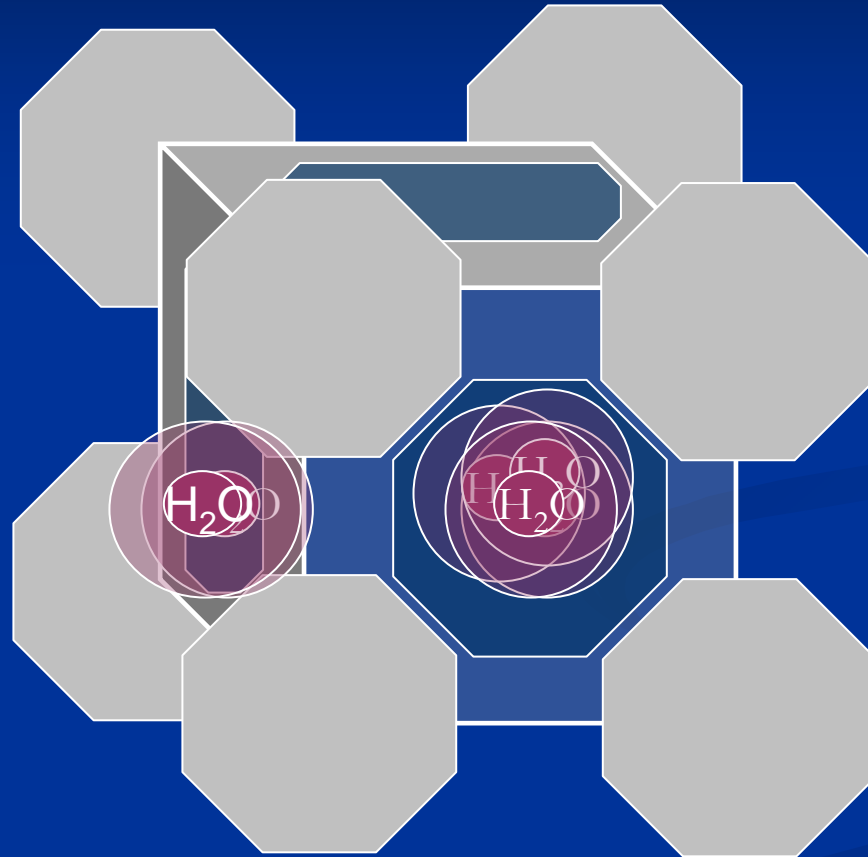
Advera WMA

How does it work?

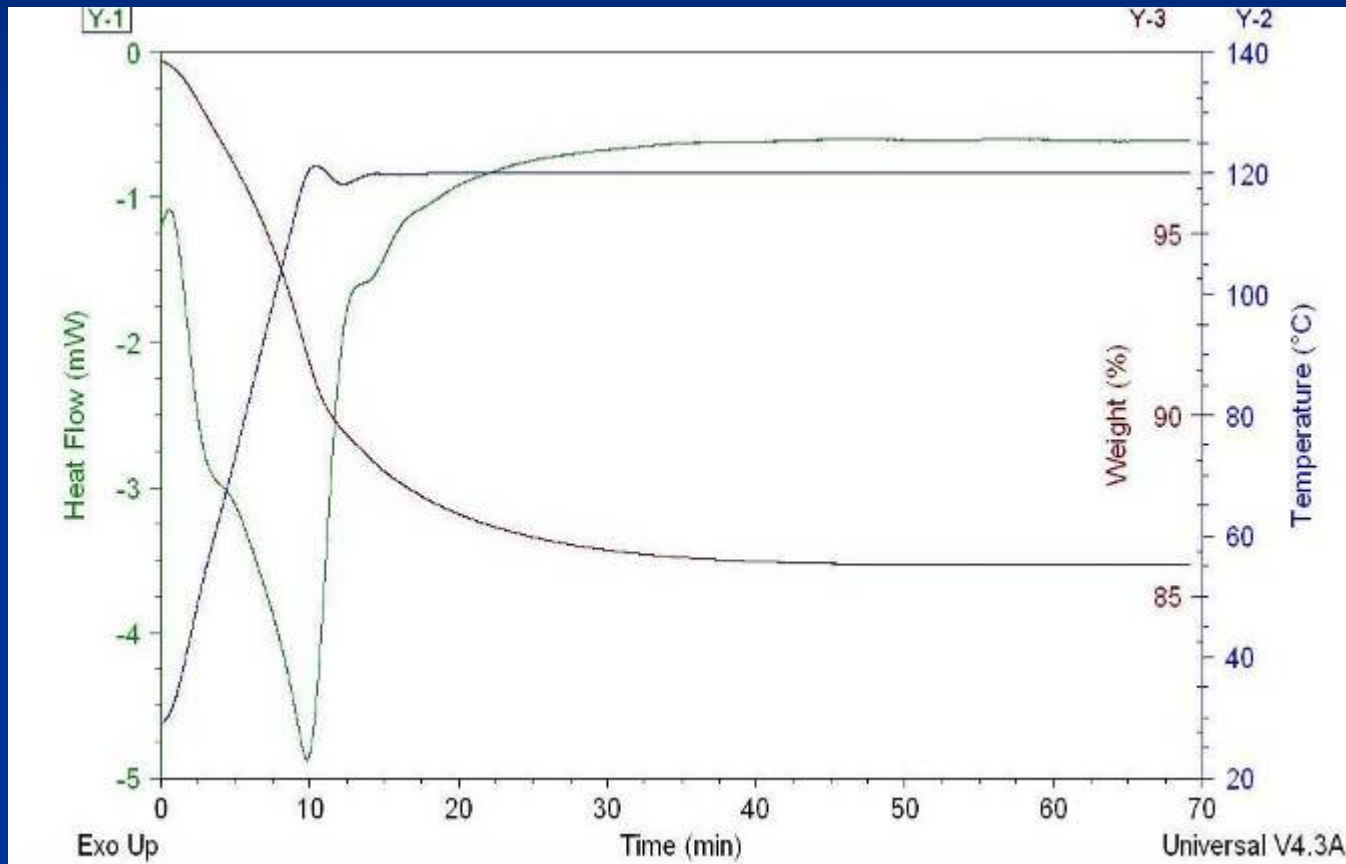
- Upon heating above 100 C, water is emitted from the zeolite structure causing micro-foaming in the asphalt concrete. (less than 1 lb of water)
 - Controlled foaming - No visual change in the asphalt concrete
 - Improves Workability, and thus compaction for overall improvement in density.
 - No chemical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

Advera WMA

How does it work?

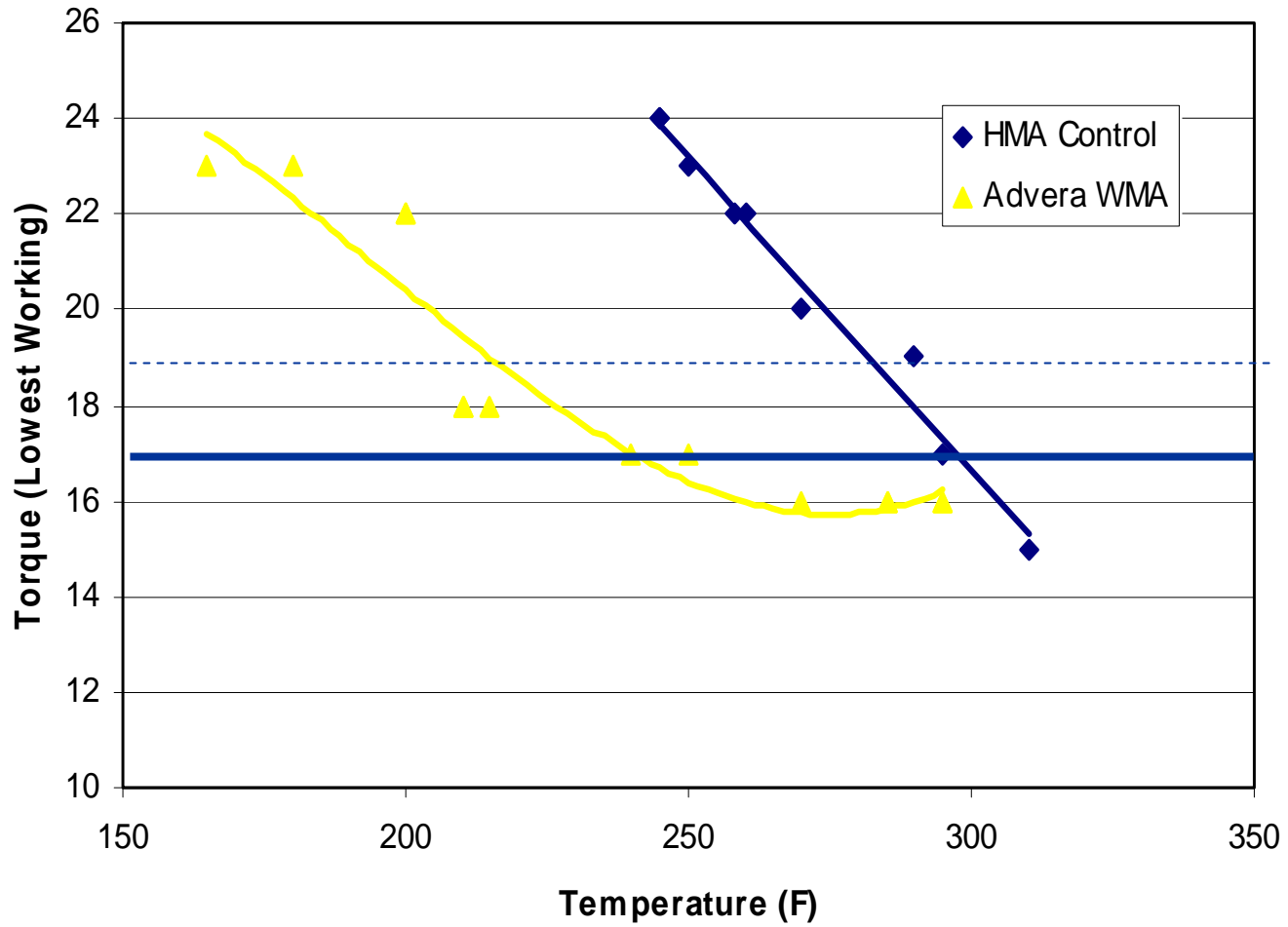


Time Release of Water



•DSC/TGA test run by Texas A&M

Torque vs. Temperature



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



Advera WMA

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% < NO_X
 - 62.8% < VOC's
 - 61.9% < CO



Advera WMA

Features & Benefits

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



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

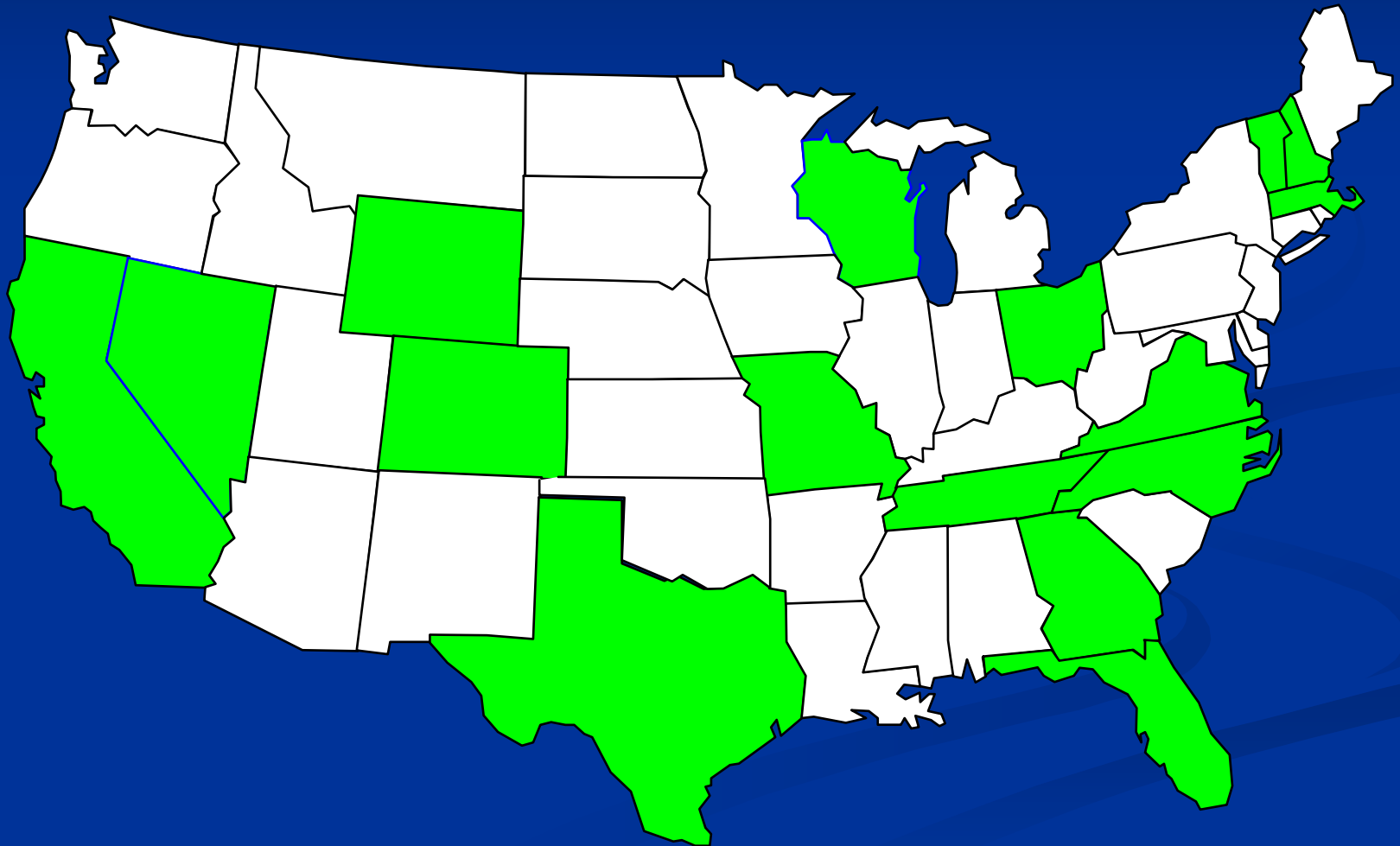
■ Mix Design

- 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

Demonstrations



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?

