


# 2008 SEAUPG CONFERENCE-BIRMINGHAM, ALABAMA


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Laboratory services



Greetings from Asphalt Institute Headquarters

2696 Research Park Drive  
Lexington, KY

## AI turns 90 in 2009



- The Asphalt Institute is an international association of 96 petroleum asphalt producers, manufacturers and affiliated businesses.
- Founded in 1919, the Institute's members represent 90% of the liquid asphalt produced in North America.

## New AI Products

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[www.asphaltinstitute.org/handbook](http://www.asphaltinstitute.org/handbook)

## National Binder Technician Certification (NBTC) Program

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### AI Certification Vision

To provide a consistent nationwide means of ensuring that asphalt binder technicians are knowledgeable and fully qualified to produce valid specification compliance and quality assurance data.



### 2008 MEMBER COMPANIES



### AFFILIATE MEMBERS



[www.asphaltinstitute.org](http://www.asphaltinstitute.org)

## Asphalt Mixture & Binder Expert Task Groups Update

Phil Blankenship  
Asphalt Institute

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## Asphalt Mix ETG & Binder ETG

- Objective
  - Provide a **forum** for the discussion of ongoing asphalt binder/mixture technology
  - Provide **technical input** for current and future research development and technology implementation related to asphalt mixtures and construction.
- Initiated in 1994
- Government, industry, & academia

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## Asphalt Mix Expert Task Group

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## Asphalt Mix Expert Task Group

- AASHTO SOM Input (Harvey)
- E\*, NCHRP 9-19 & 9-29 (Bonaquest)
- SGC Internal Calibration Only (Hall)
- Specific Gravity Task Force (West)
- Mix Design Manual, NCHRP 9-33 (Christensen)
- Aggregate Imaging Task Force (Corrigan)

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## Subcommittee on Materials Standards Update – ETG Input

- T 312 – 08 Preparing and Determining the Density of HMA Specimens by SGC
  - Internal Angle Only ( $1.16 \pm 0.02^\circ$ )
  - Only TP 71 Simulated Loading
  - Precision and Bias Based on External Angle
- TP 62 – 08 Determining Dynamic Modulus of Hot-Mix Asphalt Concrete Mixtures
  - Revisions to Existing Test Method
  - Separate standards to include AMPT



## Internal Angle of Gyration for the Superpave Gyrotory Compactor RAM and DAV

- Guidance document, possible publication as a TRB Circular through subcommittee AFK50
- Provide background information on the development of internal angle measurements
- Incorporate ASTM ILS 151 Results to AASHTO new precision statement



## Asphalt Mix Performance Tester (AMPT)



- NCHRP 9-29
- Evaluate mixture rutting and fatigue response
- Relatively inexpensive and easy to use
- Provides MEPDG input

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## Asphalt Mix Performance Tester (2009)

- Develop pooled fund for training and equipment purchase of the equipment
- Technician training for operation of the equipment (AAT contractor/NCAT Lab)
- Develop precision and bias for test procedure

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## Separate Standards for Performance Tester *Under Review*



- TP 01 - Determining the Dynamic Modulus and Flow Number for HMA Using the AMPT
- PP 01 - Preparation of Cylindrical Performance Test Specimens Using the Superpave Gyrotory Compactor
- PP 02 - Developing Dynamic Modulus Master Curves for Hot-Mix Asphalt Concrete Using the AMPT
- PP 03 - Developing Dynamic Modulus Master Curves for Hot-Mix Asphalt Concrete (TP62)



## Specific Gravity Task Group

- Task Group Objectives
  - Identify issues with current AASHTO standards
  - Evaluate alternate methods
  - Make recommendations regarding changes and/or new methods
  - Additional scope -- Mixture gravity determination issues T 209



## Specific Gravity Task Group *Current Issues*

- Need to improve the reproducibility and accuracy of the fine aggregate Gsb determination.
- The SSD method (AASHTO T 166, ASTM D2726) should be limited to specimens with a water absorption of less than or equal to 1.0 percent.
- Replace paraffin method (AASHTO T 275) with vacuum sealing method.

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## Specific Gravity Task Group SOM Recommendations

- T 166 (Bulk Specific Gravity)
  - Changes sent to replace reference to paraffin method to vacuum sealing method
  - Change water absorption limit to 1.0%
- T 331 (Corelok) – for abs. > 1.0%
- Effects on Volumetrics - possible notes:
  - Increase minimum design VMA by 0.5%
  - Reduce minimum in-place density requirement (%Gmm) by 1.0% for coarse mixes

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## NCHRP 9-33: Mix Design Manual for HMA

Final report end of 2008 (AAT)

- New volumetric criteria
- HMA performance tests
- Criteria developed with M-E design guide models
- Final critical issues being evaluated:
  - FAA values
  - CAA values
  - Flat & elongated requirements
  - Performance Tests
  - Design VMA values
  - Design gyration levels
  - RAP


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## Binder ETG Update

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- ## Binder ETG - Key Activities
- High Temperature Task Group
  - Fatigue Task Group Report
  - DSR, BBR, RTFOT Procedures
  - Low Temperature ABCD alt. to DT
  - Emulsion Asphalt Grading
  - Polyphosphoric Acid
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- ## Multi-Stress Creep and Recovery (MSCR) Test Method
- Inadequacy of Superpave high temp  $G^*/\sin\delta$  to predict modifier behavior
  - New MSCR High Temperature Spec correlates to rutting for both neat and polymer modified binders
  - Testing is done at actual pavement temperatures not some artificially high test temp that the pavement will never experience
  - The MSCR % Recovery does a much better job of identifying polymer and how it works in a binder
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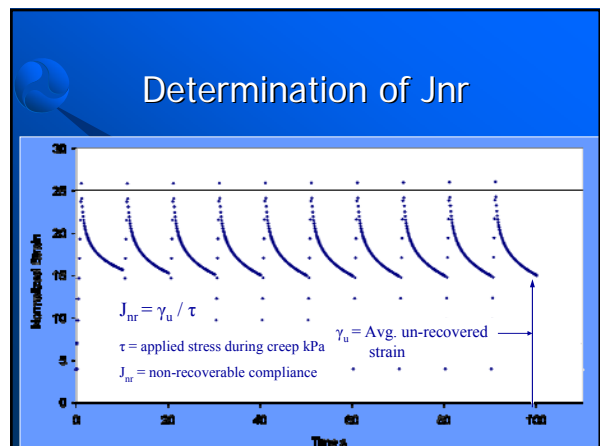
- ## New High Temperature Binder Spec M320 Table 3
- The new specification is based on the non-recoverable compliance ( $J_{nr}$ ) of the binder
  - All testing should be done at the pavement environmental grade temp to reflect response at actual operating temperatures
  - The test should be run at two stress levels 0.1 and 3.2 kPa for ten cycles at each level.
  - Low temp BBR and DTT remain unchanged
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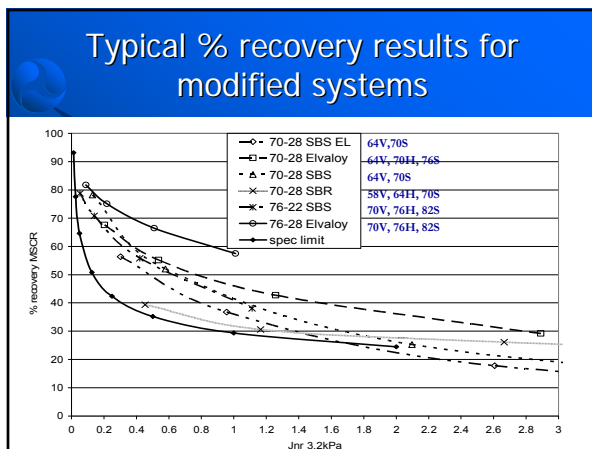
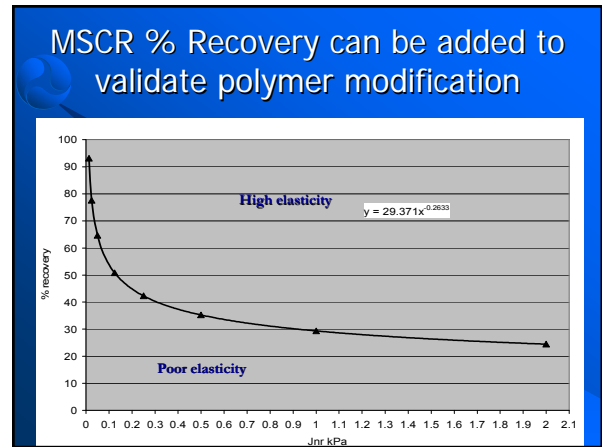
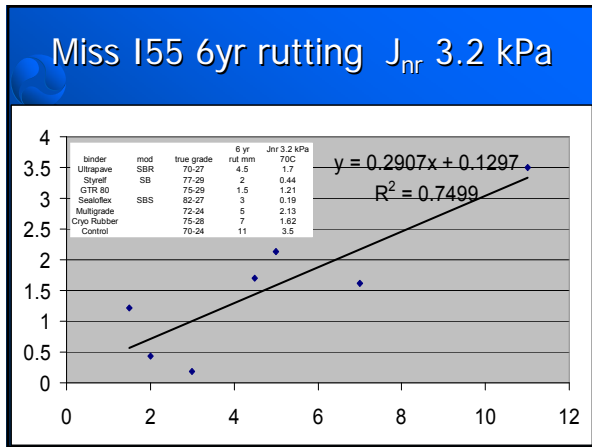
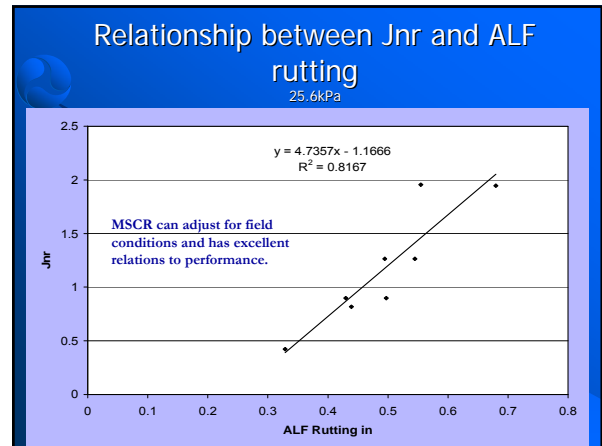
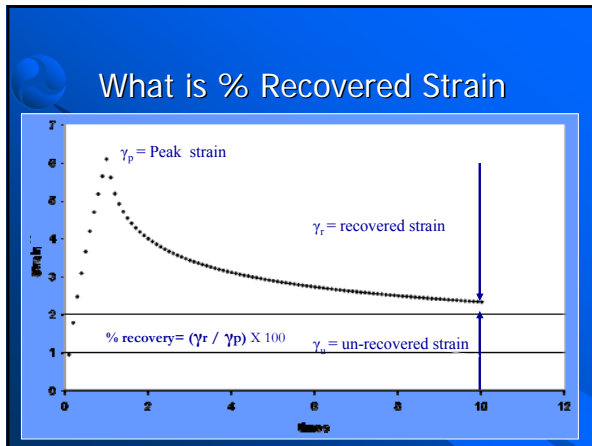
## New MSCR Binder Spec

|   | Original |    |    |    |    |
|---|----------|----|----|----|----|
| DSR $G^*/\sin\delta$<br>Min 1.0                 | 64       |    |    |    |    |
|   | RTFOT    |    |    |    |    |
| 64 Standard<br>MSCR2 < 4.0                      | 64       |    |    |    |    |
| 64 Heavy<br>MSCR 3.2 < 2.0                      | 64       |    |    |    |    |
| 64 Very heavy<br>MSCR2 < 1.0                    | 64       |    |    |    |    |
|   | PAV      |    |    |    |    |
| S grade<br>DSR $G^*/\sin\delta$<br>Max 5000     | 28       | 25 | 22 | 19 | 16 |
| H & V grade<br>DSR $G^*/\sin\delta$<br>Max 6000 | 28       | 25 | 22 | 19 | 16 |

Low temp BBR and DTT remain unchanged

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### New High Temperature Specification

- New MSCR High Temperature Spec correlates to rutting for both neat and Polymer modified binders
- Testing is done at actual pavement temperatures not some artificially high test temp that the pavement will never experience
- The MSCR % Recovery does a much better job of identifying polymer and how it works in a binder

## Workshop on Polyphosphoric Acid Modification of Asphalt Binders

- Researchers and practitioners from FHWA, state and other agencies, along with industry will present the latest information on the PPA modification and performance
- The workshop to promote interactive discussion between presenters and participants
- Sponsors: TRB, FHWA, MnDOT, Asphalt Institute, AMAP and Industry.
- April 7th & 8th, 2009 - Minneapolis, Minnesota



## Asphalt Mixture & Binder Expert Task Groups

Download ETG Presentations at:

<ftp://fhwaftp.fhwa.dot.gov>

User ID: hiptguest  
Password: hiptguest

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**Pavement Website**  
<http://www.fhwa.dot.gov/pavement>

US Department of Transportation  
Federal Highway Administration

**Pavements**

Design | Construction | Preservation | Maintenance | Management | Rehabilitation

Technical Guidance | Research | Technology Transfer (T<sup>2</sup>)

Home | Engineering | Pavements

**Focus Areas**

- Optimize Pavement Performance**
  - Asphalt
  - Concrete
  - Mechanistic-Empirical Design Guide
  - Long Life Pavements
  - Pavement Management Systems
  - Pavement Structural Analysis
  - Long Term Pavement Performance (LTPP) Program
- Advanced Quality System**
  - Stewardship Review/Quality Assurance
  - Risk Assessment
  - Variability
- Pavement Surface Characteristics**
  - Smoothness
  - Pavement Condition/Slide Quality
- Environmental Stewardship**
  - Recycling
  - Reducing Pavement Noise

**Knowledge System**

- Publications**
  - Ground Penetrating Radar
  - All Pavements Publications
- Software**
  - Quality Assurance Software
  - All Pavements Software
- Community of Practice**
  - NCHRP 1-37A (Mechanistic-Empirical) Pavement Design Guide
- Pavement Notebook**
  - Feature 1
- Events**
  - Specialists Inputs for Design Workshop, Atlanta, GA, May 4-6, 2005
- Workshops and Training**
  - M.C. Design Guide Workshop Registration
- Related Links

**About Pavements**

- Sponsors**
  - Pavement Forum
  - Asset Management
  - Division Offices
  - Federal Lands Highway Division
  - Highways for LIFE
  - Highway Policy Information
  - Infrastructure Research & Development
  - National Highway Institute
  - Pavement and Materials Technical Service Team
  - Pavement Technology
  - Program Administration
  - Safety
- Pavement Contacts
- FHWA's Strategic Goal for the Pavement Technology Program**
  - Provide leadership and technology for the delivery of long life pavements that meet our customers needs and are safe, cost effective, and can be effectively maintained.

Thank You – Questions?

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