Innovations in Slurry Surfacing Mix Evaluations

ISSA Technical Team

(Jamie Wing, Ingevity)

ISSA Technical Team

Chris Hollenback – ISSA Technical Director
Jamie Wing – Technical Team Lead

Mike Hemsley - Paragon
Pat Denney – Arkema
Bobby Behrens – Terry Asphalt Materials
Ben Yadon - Ingevity
Alejandro Rosales – Idaho Asphalt
Braxton Dickson – Western Emulsions
Brody Young – Idaho Asphalt
Daniel Swiertz - AMI
Diane Franseen – AMI
Kelly Senger – Illinois DOT
Ester Ternero - Nouryon
Alison Colaco – Nouryon
Vince Vopat - Bergkamp
Matt Mangiaracina – Ingevity
Peter Smith - Duncor

Deb Smith – AMI
Kim Gessner – AMI
Dayna Krenbrink - McAsphalt
Jeff Dunn – AMI
Erin Russell – Idaho Asphalt
George Peterson - Garco
Dave Zhai – Idaho Asphalt
John Munger – Idaho Asphalt
Janki Patel - Colas
Scott Lyman - Arkema
John Malusky – AASHTO re:source
Rich Wenthe - Ingevity
Molly Gibney – VSS
Amy Mohart – Cenovus
Garrett Locke– Viasun
Ken Messina – Asphalt Paving Systems

ISSA Technical Team Goals

- Review & Revise ISSA Technical Bulletins
  - Archive Technical Bulletins
  - Create new Technical Bulletins

- Review & Revise ISSA Guidelines (A-105, A-143, A-115)
  - Create new ISSA Guidelines

- Establish a schedule for reviewing and revising TBs & Guidelines

slurry.org

Refer to ISSA's website to reference the most current performance guidelines and technical bulletins.

ISSA Technical Team Update

Revised Technical Bulletins on Slurry.org

- TB 113: Mix Time (1/2024)
- TB 139: Cohesion (1/2025)
- TB 100: Wet Tracks (1/2025)
  - Full Gradation Wet Tracks (Revised TB in final stages)
- TB 147 & TB 109: Loaded Wheels & Sand Adhesion (8/2022)
- TB 144: SBRs (12/2024)

ISSA Technical Team Update

Archived Technical Bulletins on Slurry.org

- TB 102: Mixing, Setting & Water Resistance
- TB 106: Slurry Seal Consistency
- TB 114: Wet Stripping
- TB 115: Slurry Systems Compatibility

***These technical bulletins are also available on slurry.org (resource center-guidelines & technical bulletins).

ISSA Technical Team Update

DEEP DISH COHESIONS

- A provisional technical bulletin has been created as a test method to determine traffic readiness of a micro surfacing system by deep dish cohesion.

- Used to evaluate night-time and cold weather curing characteristics

- The initial set and cure for a micro surfacing system is expressed as a function of depression depth.

- The lab technical team is using this provisional TB throughout 2025, and it will be posted on slurry.org prior to the 2026 ISSA workshop.

ISSA Technical Team Update

The following ISSA guidelines are currently under review:

- A-105 Recommended Performance Guideline for Emulsified Asphalt Slurry Seal
- A-115: Recommended Performance Guideline for Polymer-Modified Emulsified Slurry
- A-143: Recommended Performance Guideline for Micro Surfacing

Revision of ISSA TB 100: Wet Tracks

Overview of Test Method

Purpose: To measure the wearing qualities of slurry seal and micro surfacing systems under wet abrasion conditions

Importance: This test is used to determine the minimum residual solids content needed to bind the system together.

Revision of ISSA TB 100: Wet Tracks

Overview of Test Method

Purpose: To measure the wearing qualities of slurry seal and micro surfacing systems under wet abrasion conditions

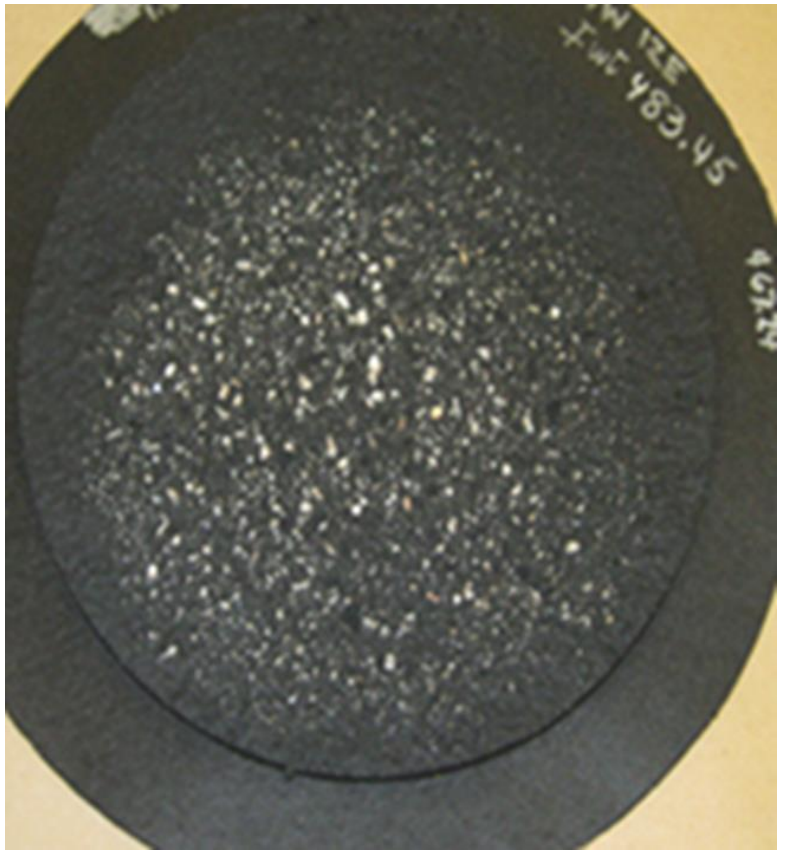
Importance: This test is used to determine the minimum residual solids content needed to bind the system together.

Revision of ISSA TB 100: Wet Tracks

Overview of Test Method

Revision of ISSA TB 100: Wet Tracks

Overview of Test Method



Revision of ISSA TB 100: Wet Tracks

Overview of Test Method

The Wet Track Abrasion Test (ISSA TB 100) requires aggregate retained on the 4.75 mm (No. 4) sieve to be scalped from the gradation before the sample is produced.

- This is likely because, when the test was developed, gradations were fine, and aggregate retained on the 4.75 mm sieve was oversized.

- The ¼”mold allowed a mix to be placed that was about 25% thicker than the largest aggregate.

Revision of ISSA TB 100: Wet Tracks

Feedback from the Industry

- Aggregates used today may contain up to 30% retained on the No. 4 sieve.
- Fines may stick to the larger stones when removing the 4's, which can lead to higher abrasion loss when testing the wet track sample.
- The gradation has changed and no longer represents what is being placed in the field.

Revision of ISSA TB 100: Wet Tracks

Feedback from the Industry

- Scalping the No. 4 material from the gradation often requires adjustments in the formulation, such as additional water to achieve a proper consistency of the mix.
- It can be difficult to place wet track samples, especially at lower emulsion contents with the finer mix containing -4 aggregate.

Revision of ISSA TB 100: Wet Tracks

Findings from Industry Studies

- Various labs have collected data comparing wet tracks that contain -4 aggregate versus full gradation aggregate.
- AASHTO accredited labs participated in an ISSA-sponsored full gradation wet track study.
- Industry data collected from 2019-2024 was shared on behalf ISSA's lab technical team during the 2025 AEMA-ARRA-ISSA Annual Meeting.
- Labs continue to evaluate wet tracks using full gradation aggregate to mimic how the mix is placed in the field.

Revision of ISSA TB 100: Wet Tracks

Findings from Industry Studies

Results obtained with scalped material may not align with the appropriate emulsion content required for a mixture containing the full gradation.

A finer gradation (after scalping the No. 4 material) may need more asphalt to bind the sample together.

Scalped

Full Gradation

Note: The sample thickness was adjusted per the gradation of the aggregate.

Revision of ISSA TB 100: Wet Tracks

Findings from Industry Studies

- Aggregates that contain a large amount of material retained on the No. 4 sieve may yield excessive loss when the aggregate is scalped, which in turn requires more emulsion to pass the wet track test and may lead to flushing in the field.

- There are regions in the US as well as in other countries that either use only ISSA type III aggregates or use aggregates that are coarser than an ISSA type III gradation.

- Areas in the US and other countries are evaluating, and in some cases requiring, full gradation wet tracks to mimic how the material is placed in the field.

Revision of ISSA TB 100: Wet Tracks

Update

- ISSA's lab technical team recommended revisions to ISSA TB 100 to ensure that slurry surfacing systems are evaluated appropriately to align test results with field performance.
- ISSA's technical director worked with the revisions team to determine which changes should be made.
- ISSA's board of directors approved the proposed revisions to TB 100.
- The revised technical bulletin is in the final stages and will be posted on slurry.org prior to the 2026 ISSA workshop.

ISSA Technical Team Update

Other action items on our to-do list:

- Create ISSA Guidelines for the use of RAP in Chip Seal & Slurry Surfacing
- Additional ideas?

Chris Hollenback

AMI Heritage Research Group

Group Lead Emulsions

ISSA Board Member & Technical Director

chollenback@hrglab.com

Jamie Wing

Ingevity

Technical Services & Development Manager, Pavement Preservation

ISSA Board Member & Chair of ISSA Technical Team

Jamie.wing@ingevity.com