

Review of the ISSA A-115 Guideline Specification for Polymer Modified Slurry Seal

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ISSA

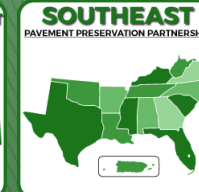
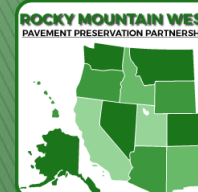
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Outline

- Brief history of slurry surfacing systems
- Why develop a new Specification Guide
- Compare Slurry Seal, Polymer Modified Slurry Seal & Micro Surfacing
- Where should I use this product?
- Next Steps
- Project Review

Ancient History

- Prior to 1980, slurry seal was generally a lower tech version of what we use today.
- Basic emulsions
- Finer aggregates
- Thinner applications
- Evaporative cure



Ralumac® Changes the Game

- In 1981, Raschig Corporation, a German company, introduced Ralumac into the US market.
- Ralumac changed the face of slurry surfacing systems in the US. Ralumac required 100% crushed aggregate, engineered emulsions, premium base asphalt, 3% natural latex and specialized application equipment.
- Ralumac was designed for rut filling and high traffic. Traffic time went from being measured in hours to measured in minutes. The future was here.
- To avoid using the trade name Ralumac, the generic product was called Micro Surfacing.

Everyone in the pool !

- Soon, everyone wanted micro surfacing but few wanted to pay the price of admission.
 - Emulsion / Aggregates / Licensing
 - True Ralumac required extra people, time and equipment to get right
- State DOTs required open bidding and lower cost products.
- Emulsion suppliers designed their own systems.
- Polymer-modified cationic quick-set (CQS-LM, CQS-1HP) slurry seals became the new micro surfacing with varying degrees of success.
- What happened to Ralumac?

Why Develop a New Spec Guide?

- Most Slurry Contractors have moved well past the A105 Guidelines.
 - Polymer Modification
 - Emulsions and Aggregates
 - Equipment
- An Agency, using the A105 could get a basic slurry when what they wanted was something else
- There is a place for the A105 both domestically and internationally. It was not time to retire the specification.
- Not every job needs the A143 Micro spec.
 - Traffic Volumes
 - Application Rate
 - Higher up on the Preservation Curve.
- The differences between A105, A143 and A115 required a new Spec Guide.

Slurry Seal (ISSA A-105)

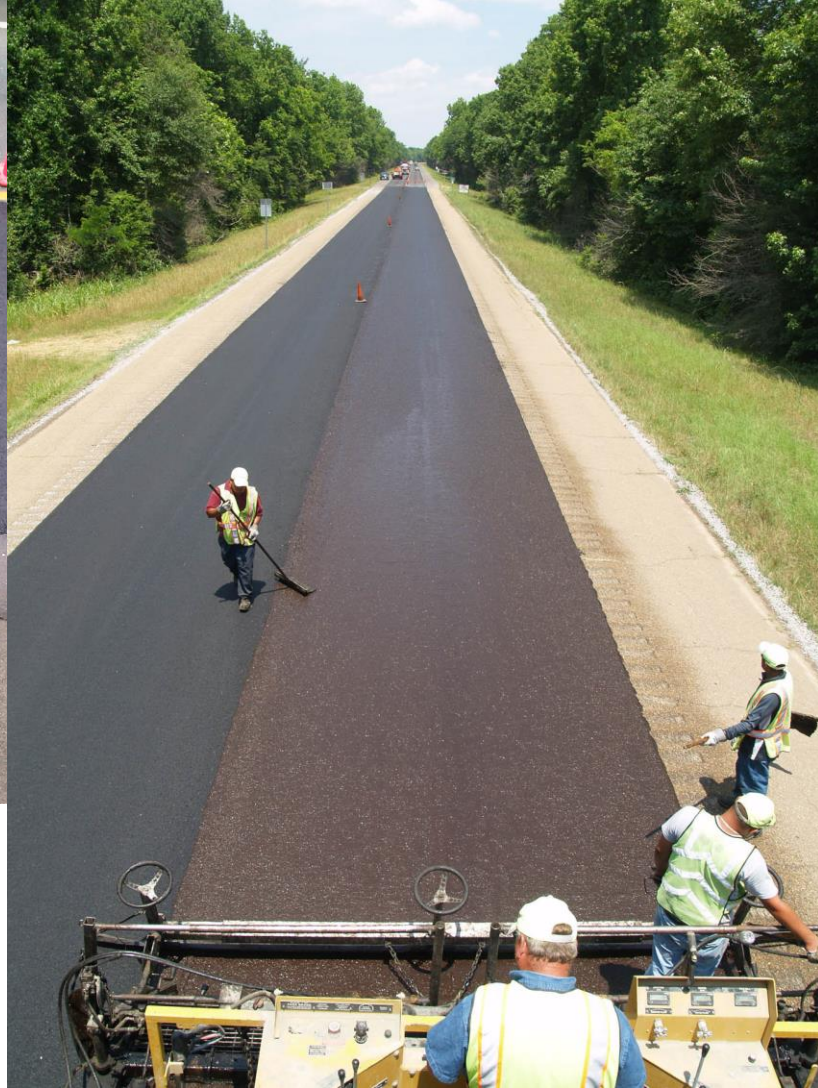
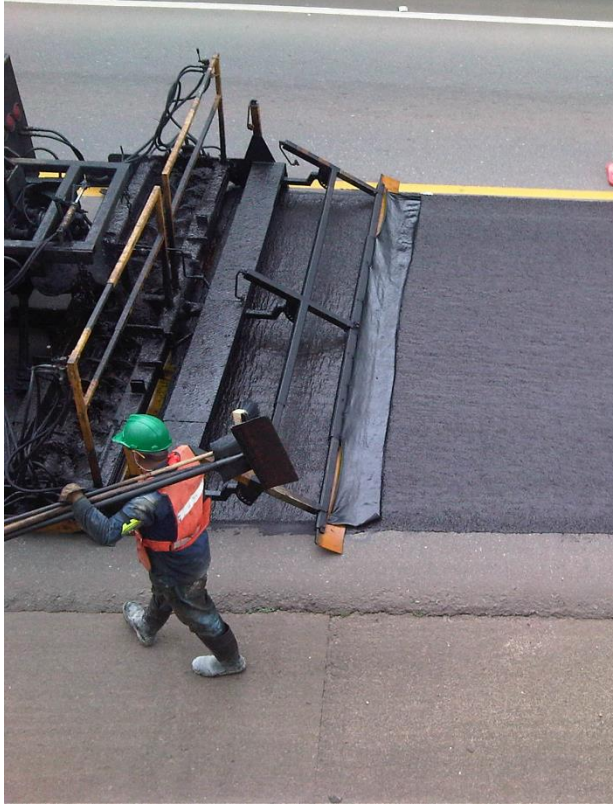
- Aggregate –
 - Should be 100% crushed – lower sand equivalent values (SEV), lower quality, higher fines
- Emulsion
 - SS, CSS, CQS – some may be polymer-modified
 - Currently, many slurry seals use a polymer-modified CQS emulsion
- Equipment
 - Lightweight spreader box, no augers needed
- Performance
 - Single stone lift, no ruts, lower traffic, may be slower return to traffic readiness
- Use
 - Residential and collector streets, highways (Especially before Ralumac) top of the preservation curve



Note the lightweight spreader box used for Slurry Seal

Micro Surfacing (ISSA A-143)

- Aggregate
 - 100% crushed
 - higher SEV, high quality, controlled fines
- Emulsion
 - Engineered cationic Micro surfacing emulsion
 - Minimum 3% polymer solids by weight of asphalt content
- Equipment
 - High horsepower pugmill, heavier spreader box with augers
- Performance
 - multi stone lifts, 1 ½” ruts, heavy traffic, full chemical reaction through break/set/cure, traffic ready within 1 hour
- Use
 - Residential and collector streets, highways, rut filling, night work, tougher conditions, farther down the preservation curve



Note the heavier spreader box

- Additional Augers
- Secondary Strikeoff
- Crown Adjustment



Polymer Modified Slurry Seal (ISSA A-115)

- Aggregate
 - 100% crushed
 - higher SEV, high quality, controlled fines
- Emulsion
 - CQS with 3 % polymer minimum by weight of asphalt – may be engineered for conditions
- Equipment
 - High horsepower pugmill, heavier spreader box with augers
- Performance
 - 1.5 stone thickness , no rut filling, moderate traffic, traffic ready within 1 hour
- Use
 - Residential and collector streets, highways, minor deformation

Can be placed with Truck Mount or Continuous Application Equipment



Materials

	A105 Slurry Seal	A143 – Micro surfacing	A115 – PM Slurry Seal
Aggregate			
T176 – Sand Equivalent (SEV)	45 Minimum	65 Minimum	60 Minimum
T96 – LA Abrasion	35 % Maximum	30 % Maximum	30 % Maximum
Emulsion			
Emulsions Allowed	M140, M208, M316 Anionic, Cationic, C-PM	M316 Cationic Polymer Modified	M316 Cationic Polymer Modified
Softer Asphalts Allowed?	No	No*	Yes (CQS-1hp vs. CQS-1P)

Mix Design Tests

	A105 Slurry Seal	A143 – Micro surfacing	A115 – PM Slurry Seal
Gradation	Type I, II and III	Type II and III	Type I, II and III
Mix Time – TB113	180 Sec. Minimum	120 Sec. Minimum	150 Sec. Minimum
Cone Consistency – TB106	Yes	No	No
Wet Cohesion – TB139	Yes	Yes	Yes
Wet Stripping – TB114	Yes	Yes	Yes
Wet Track – TB100			
One Hour Soak	75 g/ft ²	50 g/ft ²	60 g/ft ²
Six Day Soak	N/A	75 g/ft ²	N/A
Loaded Wheel –			
Sand Adhesion TB109	50 g/ft ²	50 g/ft ²	50 g/ft ²
Lateral Displacement TB147	N/A	5 % Maximum	N/A
Classification – TB144	N/A	11 Grade Points	N/A

Other Differences between A-115 and A-105 / A-143

- Asphalt Emulsion is measured as Residual Asphalt rather than Emulsion.
- A-115 Equipment section will match A-143 except any reference to Rut Filling or Leveling equipment will be removed.
- A-115 Specifically States “This is not a product to be utilized for reprofiling, leveling, or rut filling applications”.
 - Note – This statement should not preclude a double application of A-115 material or A-105 or A-143 material over or under the Polymer Modified Slurry.
 - Proper cure time is required between lifts.

Where can I use a Polymer Modified Slurry Seal?

- Anywhere you would use the A105 Specification but want to insure higher performance.
- Streets that involve ADA ramps
- Preservation Seals on streets and roadways up to and including rural interstates.
 - Higher traffic volumes and night work should call for A-143
 - The higher the traffic, the closer you should stay to single stone thickness.
- Minor corrective maintenance on low volume streets and roadways.
 - Minor means depths less than 1.5 times stone thickness.

What's Next?

- The A-115 has been released as a specification guideline.
 - **Note – Zero comments were received. Specification use appeared to be limited to the western and northwestern states initially**
 - Final A115 was published after the February 2022 PPRA Annual meeting.
- Agencies and Contractors need to use the A115 on projects.
- An updated Inspectors Manual was published in October of 2021 and is now called the Design & Inspection Manual for Slurry Surfacing Systems
- The ISSA Slurry Seal & Micro Surfacing Committee is working on revisions to the A-143 Guideline that was published in 2021

Proposed Changes to ISSA A-143 Micro Surfacing Guideline Specification

- Language will be inserted that:
 - Provides guidance on designing a custom emulsion product based on climate and performance guidelines. Mixes must meet relevant mix design tests. (WTAT & LWT)
 - Asphalt content will be measured by residual asphalt percentage rather than emulsion percentage.
 - Larger projects and those that require level-up or rut filling will be measured by the ton rather than area.
 - Allows higher asphalt contents.
 - Recommends higher application rates
- A matrix may be inserted that gives buyer agencies a method to adapt specifications to account for:
 - Night Work
 - Rut Filling
 - High traffic volumes
 - Climate Conditions

A-115 Polymer Modified Slurry Seal in VA

- VDOT Northern VA Pushback on Type II Conventional Slurry
 - Residential Work
 - Texture Complaints
 - Scuffing Damage
- Henrico County, VA Encounter same Issues
- Converted all Residential Work to Type I Polymer Modified Slurry in 2021
 - Texture Issues Resolved
 - Higher Residual AC Can Be a Challenge
- In 2023, 4 jobs on 3 Contracts



At accelerated surface temperatures conventional Slurry Seal will scuff badly. Addition of polymer (A-115) significantly improves this issue.

Approx. 5–7 minutes



Approx. 20–25 minutes



- A-115
Type I
Polymer
Modified
Slurry Seal
- Mid-90's
temps
- Wet
material ,
barely
broken, in
lane
closure,
minimal
damage



All pictures in cul-de-sacs.

Notorious areas for damage from cars, sweepers, trash trucks.



Had coloration issues here, but polymer additive dramatically reduces scuffing damage



Sweeper
truck 4 days
post
application
95+ degrees



Same
day
traffic
95+
degrees



ISSA Plugs

- **FREE** Downloads of ISSA Guideline Specifications and Technical Bulletins

Go To: www.slurry.org Click on Resource Center Tab

- **FREE** ISSA Membership to All Agencies as well as Academia !!
- ISSA Slurry Systems Workshop
January 15–19, 2024
Palace Station Hotel & Casino
Las Vegas, NV

Questions ??

