PAAMA

Pennsylvania Association of Asphalt Material Applicators

2025 Annual Conference - Innovations in Pavement Preservation

RAP Micro Surface
RAP Cape Seal
Fiberized Micro Surface

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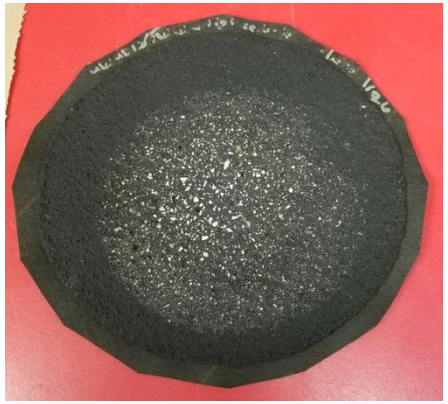
RAP Micro Surfacing

What is RAP Micro Surfacing and Why is it Becoming More Popular?

- RAP Micro is simply utilizing Reclaimed Asphalt Pavement in place of virgin aggregates
- With the aggregate sources being depleted, there's a need to turn to more sustainable resources
- Hot mix industry is milling more tons of RAP off the roadways than their using each year in new mix, so RAP piles continue to grow.

RAP Micro Surfacing

Is all RAP the same?



Asphalt Content varies from 5.5% to 8.0% (Fines used in Micro)

RAP Micro Surfacing

Screening RAP Process

RAP Micro Surfacing

Crushing & Screening RAP Process

Impact Crusher 320 SR Powerscreen

- Screen Deck - 5’ x 11’
- 3/8” screen
- 200 tons per hour

Powerscreen Chieftain 1700

- Screen Deck - 5’ x 17’
- 4mm screen
- 275-300 tons per hour

RAP Micro Surfacing

100% RAP vs. Blends

100% RAP

- Material compacts in equipment
- Requires special equipment
- Mix build-up on spreader box and pugmill
- Single course
- Surface Damage (High Temps)

50/50 Blends

- No Compaction
- No additional equipment required
- Minimal material build-up
- Multi-Layers (Heavier application rate)
- No Issues w/ high temps

RAP Micro Surfacing

Collaboration Is How We Get There

- Research
- Study
- Collaboration
- Implementation

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

RAP Micro Surfacing

Collaboration Is How We Get There

PENNDOT

KENTUCKY TRANSPORTATION CABINET

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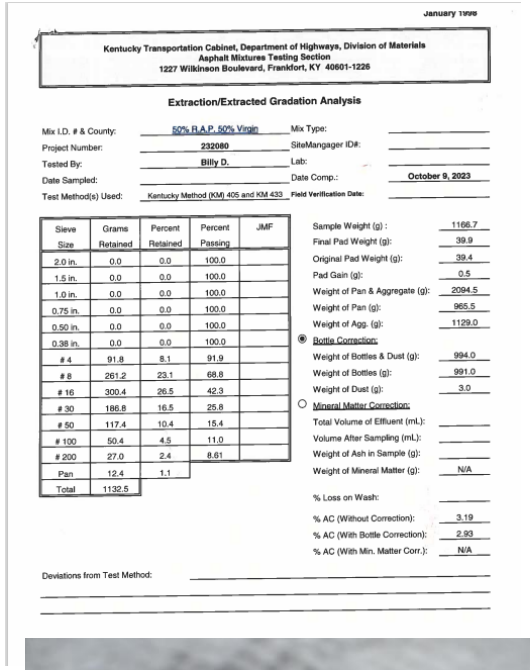
Rap in Micro Surfacing

Extraction & Gradation



Kentucky Transportation Cabinet, Department of Highways, Division of Materials
Asphalt Mixtures Testing Section
1227 Wilkinson Boulevard, Frankfort, KY 40601-1226

Extraction/Extracted Gradation Analysis

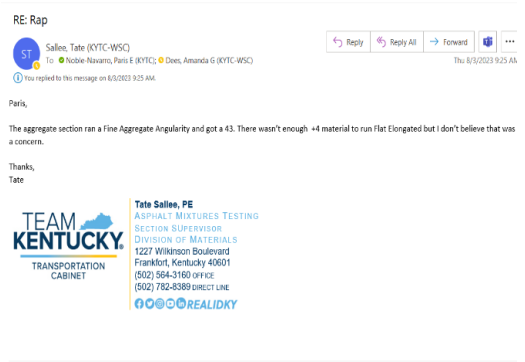
Mix I.D. # & County: 50% R.A.P. 50% Virgin
Project Number: 232080
Tested By: Billy D.
Date Sampled:
Test Method(s) Used: Kentucky Method (KM) 405 and KM 433
Mix Type:
SiteMangager ID#:
Lab:
Date Comp.: October 9, 2023
Field Verification Date:

Sieve Size	Grams Retained	Percent Retained	Percent Passing	JMF
2.0 in.	0.0	0.0	100.0	
1.5 in.	0.0	0.0	100.0	
1.0 in.	0.0	0.0	100.0	
0.75 in.	0.0	0.0	100.0	
0.50 in.	0.0	0.0	100.0	
0.38 in.	0.0	0.0	100.0	
# 4	91.8	8.1	91.9	
# 8	261.2	23.1	68.8	
# 16	300.4	26.5	42.3	
# 30	186.8	16.5	25.8	
# 50	117.4	10.4	15.4	
# 100	50.4	4.5	11.0	
# 200	27.0	2.4	8.61	
Pan	12.4	1.1		
Total	1132.5			

Sample Weight (g) : 1166.7
Final Pad Weight (g): 39.9
Original Pad Weight (g): 39.4
Pad Gain (g): 0.5
Weight of Pan & Aggregate (g): 2094.5
Weight of Pan (g): 965.5
Weight of Agg. (g): 1129.0
◉ Bottle Correction:
Weight of Bottles & Dust (g): 994.0
Weight of Bottles (g): 991.0
Weight of Dust (g): 3.0
○ Mineral Matter Correction:
Total Volume of Effluent (mL):
Volume After Sampling (mL):
Weight of Ash in Sample (g):
Weight of Mineral Matter (g): N/A
% Loss on Wash:
% AC (Without Correction): 3.19
% AC (With Bottle Correction): 2.93
% AC (With Min. Matter Corr.): N/A

Deviations from Test Method:

Fine Angularity & Elongated



RE: Rap

Sallee, Tate (KYTC-WSC)
To: Noble-Navarro, Paris E (KYTC); Dees, Amanda G (KYTC-WSC)
Thu 8/3/2023 9:25 AM

Paris,

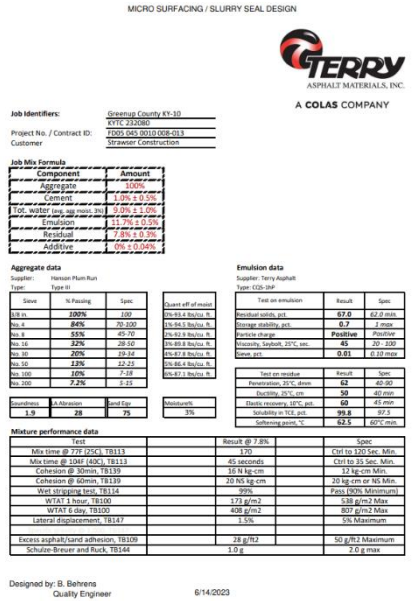
The aggregate section ran a Fine Aggregate Angularity and got a 43. There wasn't enough +4 material to run Flat Elongated but I don't believe that was a concern.

Thanks,
Tate

TEAM KENTUCKY TRANSPORTATION CABINET

Tate Sallee, PE
Asphalt Mixtures Testing
Section Supervisor
Division of Materials
1227 Wilkinson Boulevard
Frankfort, Kentucky 40601
(502) 564-3160 OFFICE
(502) 782-8389 DIRECT LINE
REALIDKY

Mix Design



MICRO SURFACING / SLURRY SEAL DESIGN

TERRY ASPHALT MATERIALS, INC.
A COLAS COMPANY

Job Identifiers: Greenup County KY-10 / KYTC 232080
Project No. / Contract ID: 1005 045 0010 008-013
Customer: Strawser Construction

Job Mix Formula

Component	Amount
Aggregate	100%
Cement	1.0% ± 0.5%
Tot. water (avg. agg moist. 3%)	9.0% ± 1.0%
Emulsion	11.7% ± 0.5%
Residual	7.8% ± 0.3%
Additive	0% ± 0.04%

Aggregate data
Supplier: Hanson Plum Run
Type: Type III

Sieve	% Passing	Spec
3/8 in.	100%	100
No. 4	84%	70-100
No. 8	55%	45-70
No. 16	32%	28-50
No. 30	20%	19-34
No. 50	13%	12-25
No. 100	10%	7-18
No. 200	7.2%	5-15

Soundness	LA Abrasion	Sand Eqv.
1.9	28	75

Quant eff of moist	Moisture%
1%-91.4 lbs/cu. ft.	3%
1%-94.5 lbs/cu. ft.	
1%-92.9 lbs/cu. ft.	
3%-89.8 lbs/cu. ft.	
3%-87.8 lbs/cu. ft.	
3%-86.4 lbs/cu. ft.	
3%-87.1 lbs/cu. ft.	

Emulsion data
Supplier: Terry Asphalt
Type: CQS-1HP

Test on emulsion	Result	Spec
Residual solids, pct.	67.0	62.0 min.
Storage stability, pct.	0.7	1 max
Particle charge	Positive	Positive
Viscosity, Saybolt, 25°C, sec.	45	20 - 100
Sieve, pct.	0.01	0.10 max

Test on residue	Result	Spec
Penetration, 25°C, dmm	62	40-90
Ductility, 25°C, cm	50	40 min
Elastic recovery, 10°C, pct.	60	45 min
Solubility in TCE, pct.	99.8	97.5
Softening point, °C	62.5	60°C min.

Mixture performance data

Test		Result @ 7.8%		Spec
Mix time @ 77F (25C), TB113		170		Ctrl to 120 Sec. Min.
Mix time @ 104F (40C), TB113		45 seconds		Ctrl to 35 Sec. Min.
Cohesion @ 30min, TB139		16 N kg-cm		12 kg-cm Min.
Cohesion @ 60min, TB139		20 NS kg-cm		20 kg-cm or NS Min.
Wet stripping test, TB114		99%		Pass (90% Minimum)
WTAT 1 hour, TB100		173 g/m2		538 g/m2 Max
WTAT 6 day, TB100		408 g/m2		807 g/m2 Max
Lateral displacement, TB147		1.5%		5% Maximum
Excess asphalt/sand adhesion, TB109		28 g/ft2		50 g/ft2 Maximum
Schutze-Breuer and Ruck, TB144		1.0 g		2.0 g max

Designed by: B. Behrens
Quality Engineer
6/14/2023

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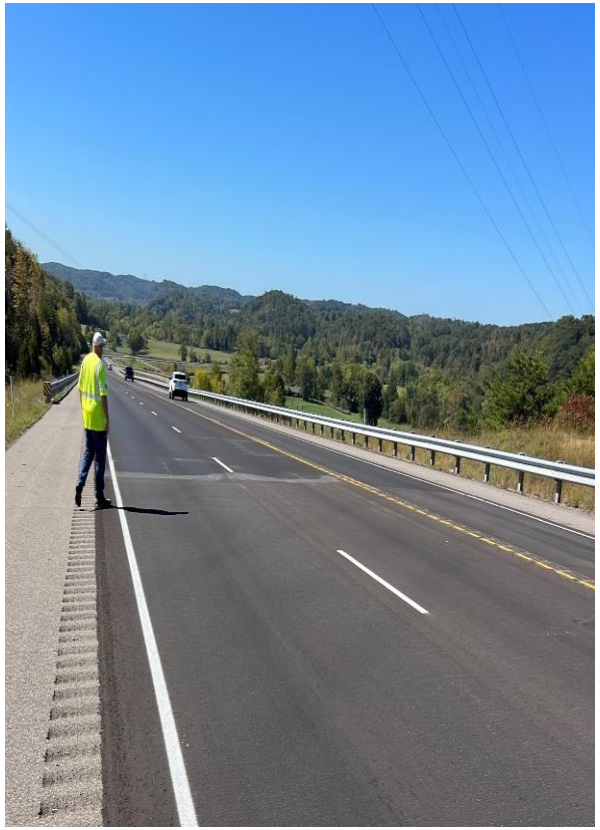
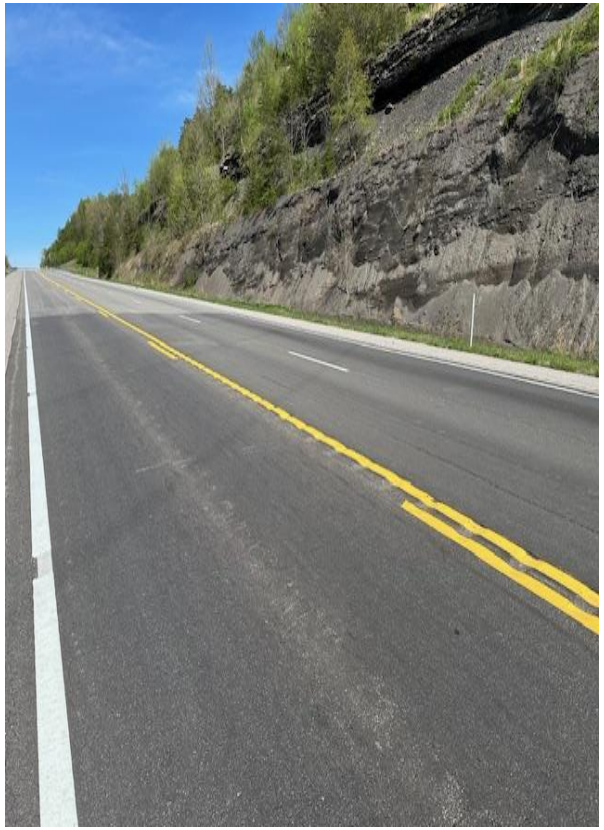
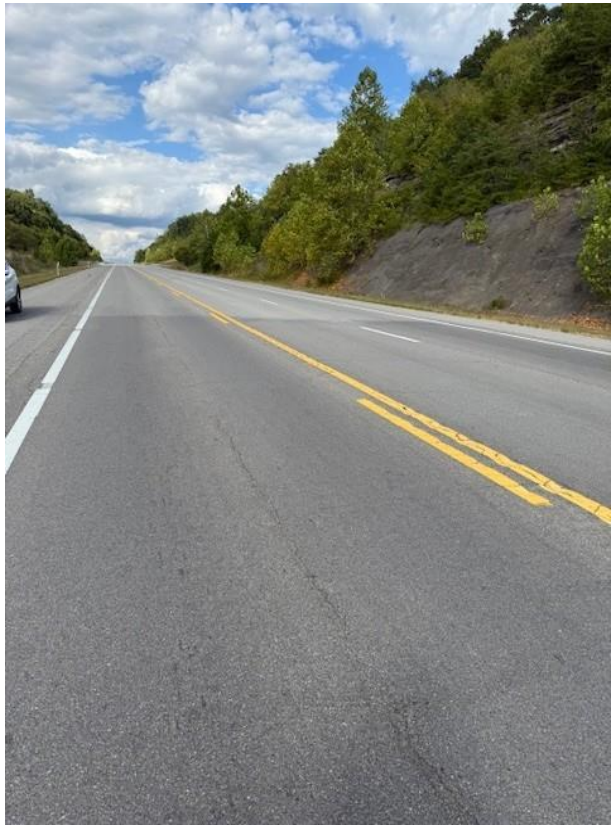
August 2023



September 2024



August 2025



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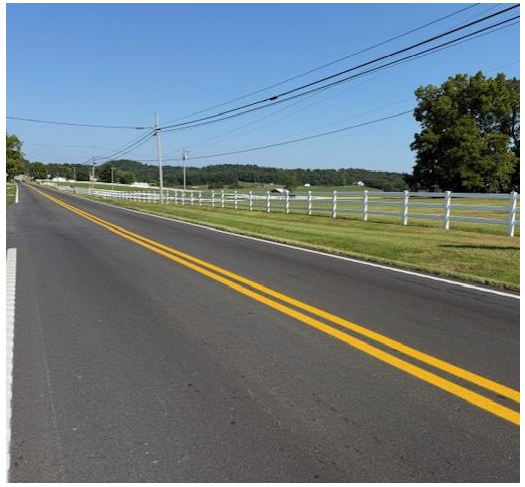
June 10, 2025

June 10, 2025

June 10, 2025

June 12, 2025

August 19, 2025



August 24, 2023

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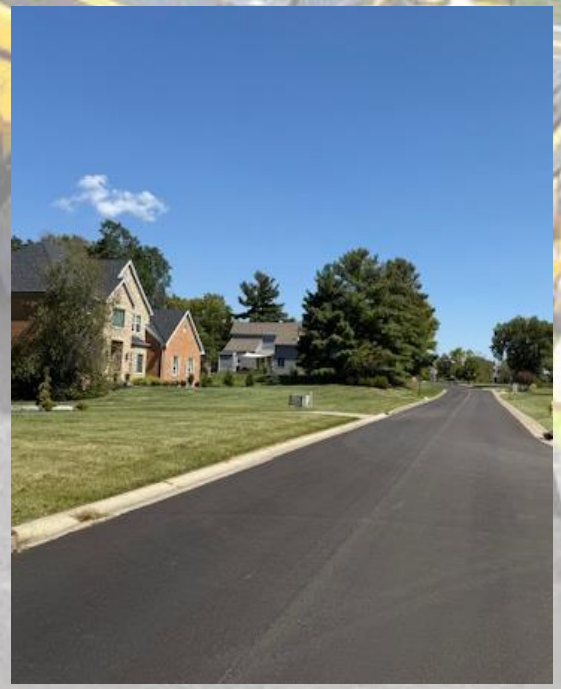
RAP Cape Seals



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Soft Binder Fiber Micro

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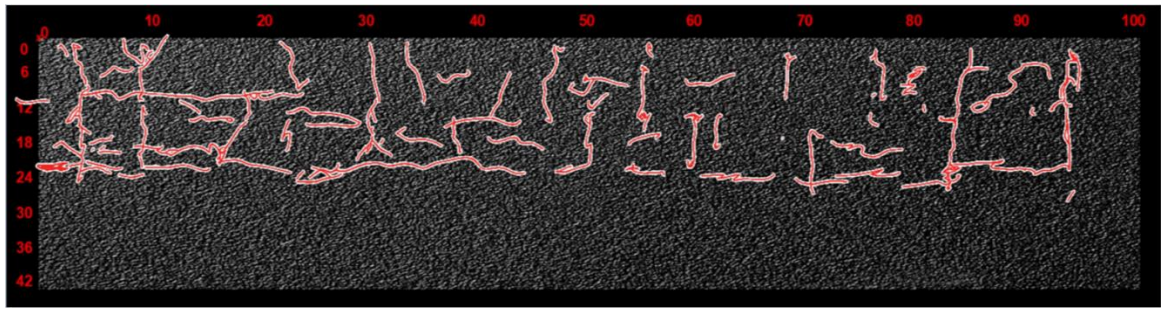
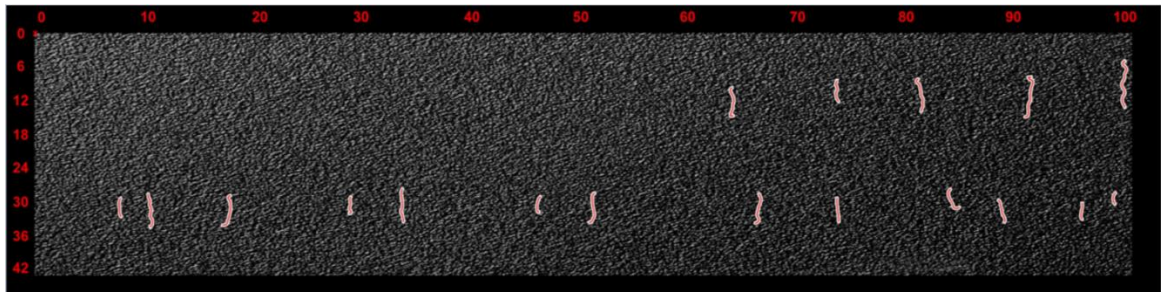
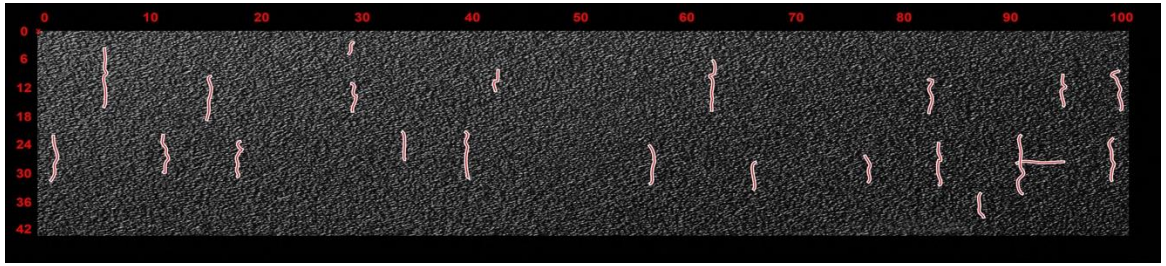
Soft Binder Fiber Micro







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Soft Binder Fiber Micro

2021

2025

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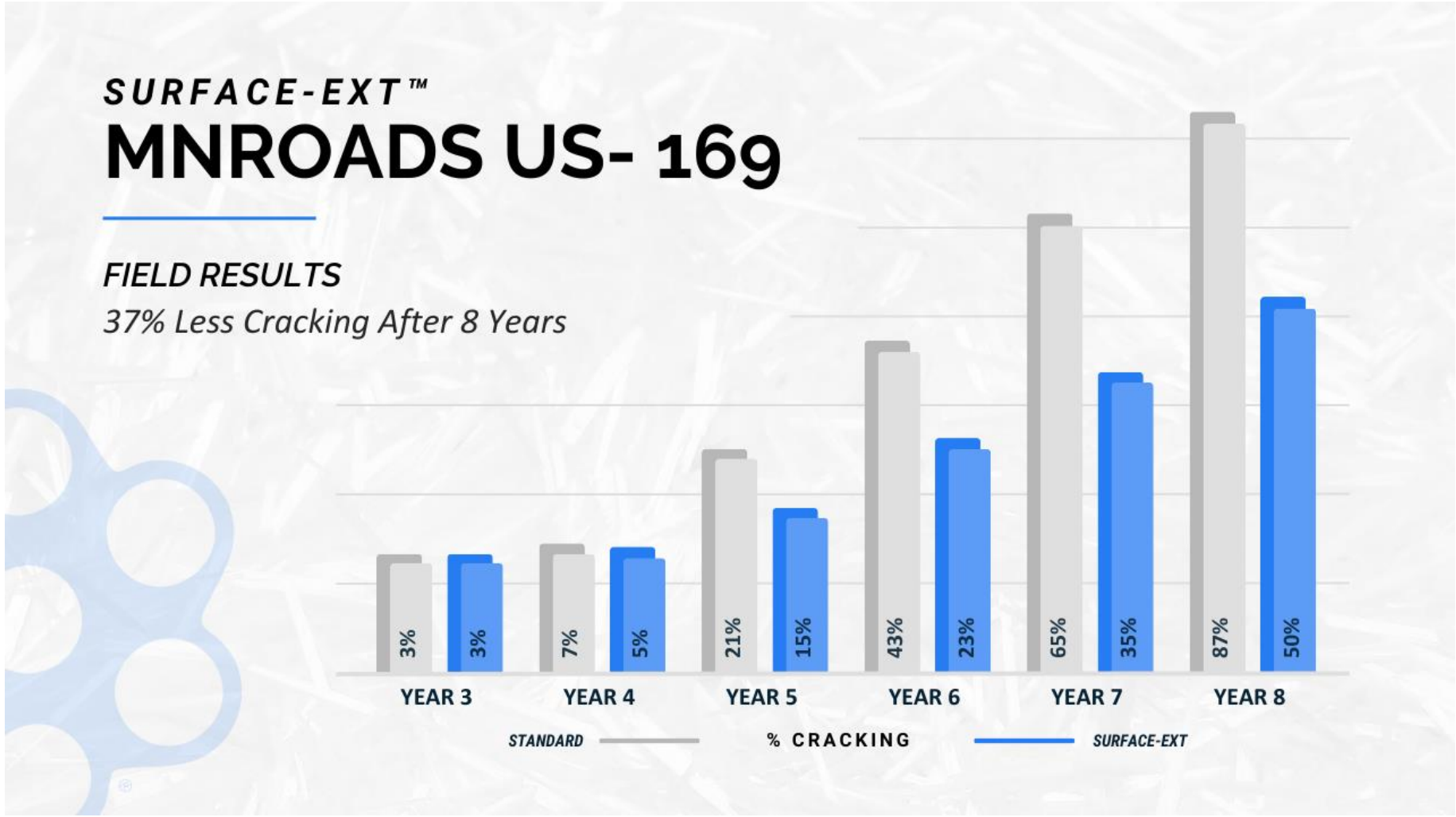

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