



Test Data

Product Information

Manufacturer Name:	SoyLei Innovations, LLC
Product Name:	SIP-1111 Rejuv, SIP-1111P, SIP-1111-1
Evaluation Type:	New Product Evaluation
DataMine Number:	AMRA-2025-02-003
Description:	Partially epoxidized soybean oil. Often referred to as sub epoxidized soybean oil (SESO).

Other Information

Type of Evaluation Requested:	AMRA - Lab Mixed
Base Material:	Soybean oil that has been partially epoxidized
Appearance:	slightly yellow
Recycling Agent Dosage:	Min:0.1 Max:5
Addition rate to mix:	depends upon the desired reduction in stiffness. Typically 1% per every 30 minutes.
Are there any Dilution options?:	No
pH@25°C (77° F):	Slightly below 7.
Lbs/Gal@25°C (77° F):	8.28-8.30

AMRA
Testing

Additional Documentation

Release Status: Private			
Sample Properties			
AMRA Doasage (% by weight of virgin asphalt It binder).		3.2	
Release Status: Private			
Asphalt Properties (M 320 & M 332)			
Attributes	Unit	Control	AMRA
Original Viscosity(T 316)	Pa*s	0.5	0.38
Original DSR Temp(T 315)	°C	64	58

Asphalt Properties (M 320 & M 332)			
Attributes	Unit	Control	AMRA
Original DSR G * / sin delta(T315)	kPa	2.01	1.99
Original DSR phase angle(T315)	degrees	85.9	86.5
RTFO DSR Temp(T 315)	°C	70	58
RTFO DSR G*/sin delta(T315)	kPa	2.24	4.51
PAV DSR Temp(T315)	°C	25	7
PAV DSR G*sin delta(T315)	kPa	4310	5514
PAV BBR Temp(T313)	°C	-12	-18
PAV BBR Stiffness(T313)	MPa	174	277
PAV BBR m-value (T313)		0.312	0.313
PAV Delta Tc	°C	-2.8	0.5
Continous Grade, one PAV cycle		69.7-23.6	63.5-28.7
2PAV BBR Temp(T313)	°C	-6	-12
2PAV BBR Stiffness(T313)	MPa	103	169
2PAV BBR m-value (T313)		0.337	0.339
2PAV Delta Tc	°C	-4	-0.1
Continous Grade, two PAV cycle		69.7-21.2	63.5-27.0
RTFO MSCR, Jnr 1.0 (T 350)	kPa ⁻¹	1.2	4.5
RTFO MSCR, Jnr 3.2 (T 350)	kPa ⁻¹	1.4	4.9
RTFO MSCR, Jnr Diff (T 350)	%	11.7	8.6
RTFO MSCR, Recovery 3.2 (T 350)	%	3.3	0

Release Status: **Private**

Mixture Properties		
Attributes	Unit	Control
NMAS (R 35 and Appendix X2 of R 35)	mm	9.5

Mixture Properties		
Attributes	Unit	Control
RAP Content	%	45
Asphalt Content	%	5.5
Maximum Specific Gravity (T 209)		2.435
Bulk Specific Gravity (T 166)		2.337
Air Voids (T 269)	%	4
VMA (M 323)	%	15.8
VFA (M 323)	%	74.7
Ndes	gyrations	60
Mixing Temp	°C	310
Compaction Temp	°C	290

Release Status: **Private**

Aggregate Properties		
Attributes	Unit	Control
Percent Passing 3/4" (T 27)	%	100
Percent Passing 1/2" (T 27)	%	100
Percent Passing 3/8" (T 27)	%	97
Percent Passing #4 (T 27)	%	76
Percent Passing #8 (T 27)	%	56
Percent Passing #16 (T 27)	%	46
Percent Passing #30 (T 27)	%	37
Percent Passing #50 (T 27)	%	24
Percent Passing #100 (T 27)	%	12
Percent Passing #200 (T 27)	%	6.7
Aggregate Bulk Gravity, Gsb (T 84 & T 85)		2.624
Aggregate Effective Gravity, Gse (T 84 & T 85)		2.643
Aggregate Absorption(T 84 & T 85)		1
Flat & Elongated Particles (D4791)	%	0
Sand Equivalent (T 176)	%	77

Aggregate Properties		
Attributes	Unit	Control
Coarse Aggregate Angularity Fractured Faces (T 335)	%	97/93
Uncompacted Voids (T 304)		47
Sulfate Soundness (T 103)	%	0.5
LA Abrasion (T 96)	%	39.7
Micro Deval (T 327)	%	2.4
Aggregate Type (Source)		Gravel & Sand (Alabama)

Release Status: **Private**

RAP Properties		
Attributes	Unit	Control
RAP Geographic Source (City/State)		Brantley, AL
Date Of RAP Sourcing		7/4/2022
RAP Asphalt Content (Extraction)	%	4.8
Percent Passing 3/4" (T 27)	%	100
Percent Passing 1/2" (T 27)	%	99.5
Percent Passing 3/8" (T 27)	%	97.3
Percent Passing #4 (T 27)	%	79.6
Percent Passing #8 (T 27)	%	57.5
Percent Passing #16 (T 27)	%	42.4
Percent Passing #30 (T 27)	%	32.4
Percent Passing #50 (T 27)	%	23.3
Percent Passing #100 (T 27)	%	15.4
Percent Passing #200 (T 27)	%	10.8
RAP Binder Continuous Grade		108.1-8.7
RAP Binder Delta Tc	°C	-5.1
Date Of Continuous Grade Measurement		9/19/2022

Release Status: **Private**

Mixture Volumetrics			
Attributes	Unit	Control	AMRA
Maximum Specific Gravity (T 209)		2.435	2.447
Bulk Specific Gravity (T 166)		2.337	2.337
Air Voids (T 269)	%	4	4.5

Release Status: **Private**

Ham-burg Wheel-Tracking Test (T 324)			
Attributes	Unit	Control	AMRA
Test Temperature	°C	50	50
Specimen Fabrication Date		9/29/2022	1/8/2026
Specimen Testing Date		10/11/2022	1/14/2026
Air Voids (T 269)	%	7.1	6.9
Rut Depth at 5,000 Passes	mm	1.6	2.2
Rut Depth at 10,000 Passes	mm	2	2.8
Rut Depth at 15,000 Passes	mm	2.5	3.2
Rut Depth at 20,000 Passes	mm	3.1	3.5
Passes to 12.5mm Rut Depth			
Stripping Inflection Point			

HWTT Sample Photos

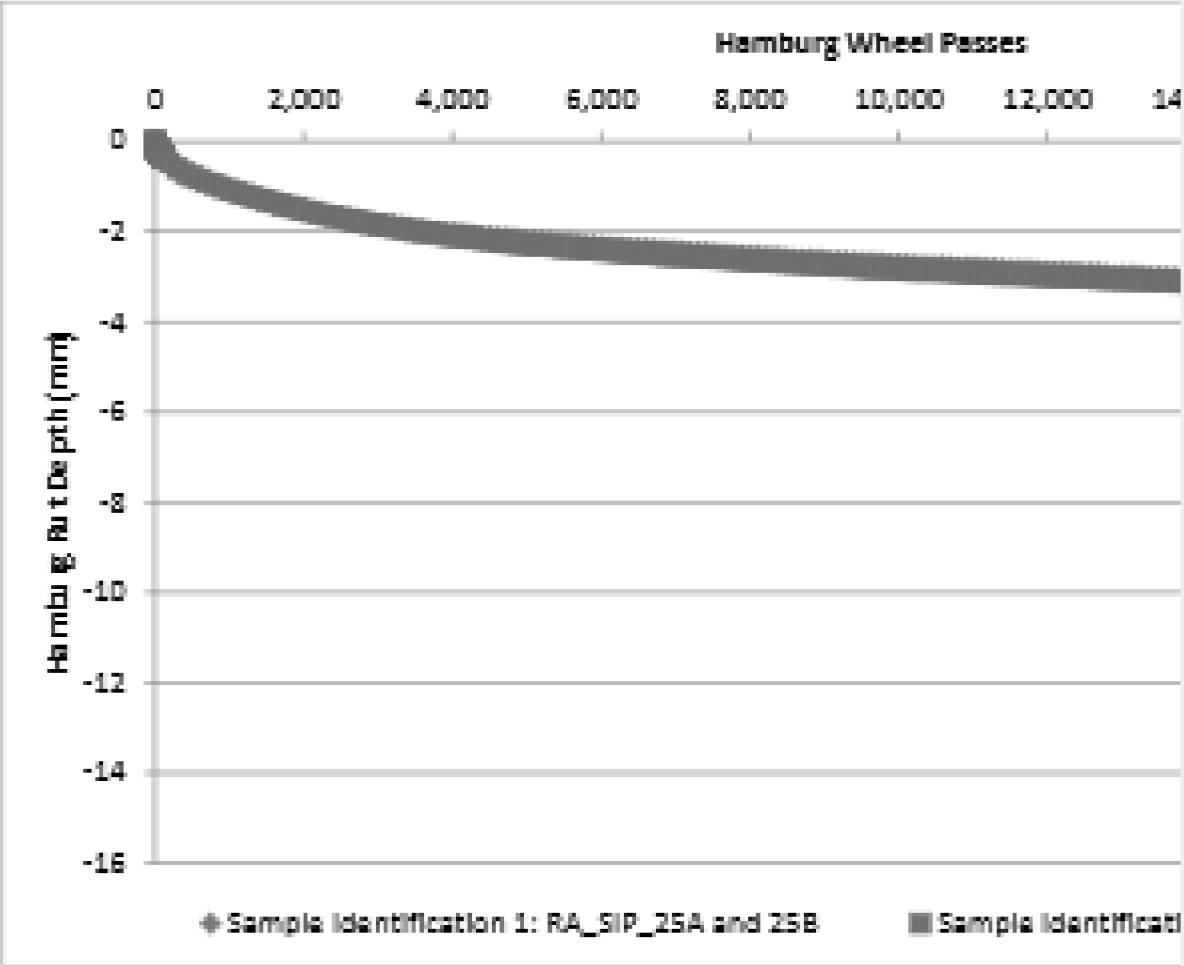
Photos



SIP 1111_HWTT Samples Control_HWTT Samples

PDF Plot

PDF Plot	Document
SIP 1111_HWTT Plot	SIP1111_HWTT Plot.pdf
Control_HWTT Plot	Control_HWTT Plot.pdf



Release Status: **Private**

Overlay Test (Modified Tex-248-F)

Attributes	Unit	Control	AMRA
Test Temperature	°C	25	25

Overlay Test (Modified Tex-248-F)			
Attributes	Unit	Control	AMRA
Specimen Fabrication Date		10/3/2022	1/16/2026
Specimen Testing Date		10/12/2022	1/26/2026
Air Voids (T 269)	%	7.1	7.4
Number of Cycles of Failure (Nf), average		225	300.3
Number of Cycles of Failure (Nf), standard deviation		79.4	63.8
Number of Cycles of Failure (Nf), COV		0.35	0.21
Cracking Resistance Index (CRI), average		0.262	0.241
Cracking Resistance Index (CRI), standard deviation		0.013	0.012
Cracking Resistance Index (CRI), COV		0.05	0.05

Release Status: **Private**

Indirect Tensile Asphalt Cracking Test (ASTM D8225)-Short-term Aging			
Attributes	Unit	Control	AMRA
Test Temperature	°C	25	25
Specimen Fabrication Date		9/29/2022	1/8/2026
Specimen Testing Date		10/3/2022	1/14/2026
Air Voids (T 269)	%	7	6.9
Cracking Tolerance Index (CTIndex), average		14.6	16.7
Cracking Tolerance Index (CTIndex), standard deviation		1.3	2.6
Cracking Tolerance Index (CTIndex), COV		0.09	0.16

Release Status: **Private**

Indirect Tensile Asphalt Cracking Test (ASTM D8225)-Long-term Aging

Attributes	Unit	Control	AMRA
Test Temperature	°C	25	25
Specimen Fabrication Date		9/30/2022	1/9/2026
Specimen Testing Date		10/3/2022	1/14/2026
Air Voids (T 269)	%	6.9	6.7
Cracking Tolerance Index (CTIndex), average		4.2	4.8
Cracking Tolerance Index (CTIndex), standard deviation		0.9	0.9
Cracking Tolerance Index (CTIndex), COV		0.2	0.19