



AAPA **2011** **STUDY TOUR** **CAPSA/ITI**

Surface Treatments #2

AAPA2011 Study Tour – Surface Treatments #2

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Introduction

- Spray Seals cont ..
 - Seals unique to South Africa
 - Heavy duty spray seals
- Cape Seals
- Slurry

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Double Seal

- Double seals ain't Double seals
- 19/9.5, 13.2/6.7 common

- 1st Layer stone
 - Shoulder to shoulder spread rate
 - 10 – 12 t steel drum
 - No traffic

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Split Seal

- 19mm + 6.7mm + 6.7mm

- Fine texture of small seal
- High binder rates of large seal
- Lower noise
- Reduced water spray

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Split Seal

- Binder tack coat and the 19mm aggregate.
- The 1st application of 7mm
 - applied with binder (wet method) or
 - without (dry method).
 - Aggregate is spread at a rate of between 220 – 350 m²/m³.
- Surface rolled with a 5 - 8 ton steel drum roller
- Penetration coat of binder and the 2nd layer of 7mm applied at a rate of 150-170 m²/m³.

Split Seal



Split Seal

	Dry method			Wet method		
	5000	10000	20000	5000	10000	20000
ELV	5000	10000	20000	5000	10000	20000
SE-2 tack coat	1.4 hot	1.3 hot	1.1 hot	1.4 hot	1.3 hot	1.1 hot
19.0 mm	70 m ² /m ³	70 m ² /m ³	70 m ² /m ³	70 m ² /m ³	70 m ² /m ³	70 m ² /m ³
Cat 65% penetration coat				1.1 hot	1.1 hot	1.0 hot
6.7 mm choke	300 m ² /m ³	300 m ² /m ³	300 m ² /m ³	250 m ² /m ³	250 m ² /m ³	250 m ² /m ³
SE-2 penetration coat	1.1 hot	1.1 hot	1.0 hot	1.0 hot	1.0 hot	1.0 hot
6.7 mm	155 m ² /m ³	155 m ² /m ³	155 m ² /m ³	155 m ² /m ³	155 m ² /m ³	155 m ² /m ³
Fog Spray (50/50 Cat 65%)	1.1 hot	1.0 hot	1.0 hot			
Total net binder	2.45	2.35	2.1	2.45	2.35	2.1

ELV = Light Vehicles + 40 x Heavy Vehicles

Heavy Duty Seals

- N3 Toll Concession
- Traffic loads well in excess of 5 000 v/l/d (>15%HV)
- Modified binder recommended
- Reseals over asphalt

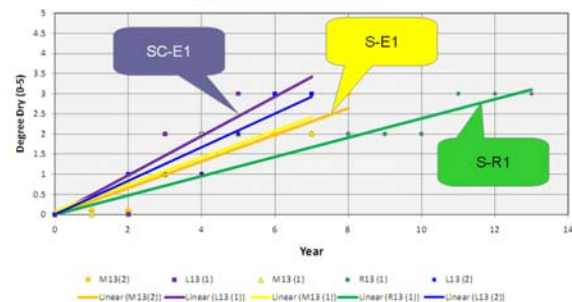


Heavy Duty Seal

- Field Blended 20% Crumb Rubber
 - On site testing
 - Used within 6 hours



13,2 mm Modified Binders



Heavy Duty Seals

- Following precautions are suggested:
 - Avoid the use of cutter
 - Allow trafficking for two hours before the pavement temperature drops below 25° C then close to traffic overnight
 - Do not open to traffic if pavement temperature exceeds the softening point of the binder minus 15° C.
 - Apply an emulsion cover spray outside of trafficked areas



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Heavy Duty Seals

- 16mm Seal
 - Binder 2.3 l/m²
 - Aggregate 80 m²/m³
- 19/9.7 mm Seal
 - Binder 4 l/m²
 - Aggregate 70 m²/m³

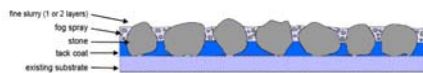


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Cape Seals

- 13 or 19mm single seal + slurry
- Widely used, 10% of new works
- Intersections & turning traffic
- Low level of maintenance expected
- Holding treatment over winter



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Cape Seals

- Penetration grade binder
- Application rate minimum to hold aggregate
- Open aggregate spread rate



- Seal trafficked for not less than four days



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Cape Seals

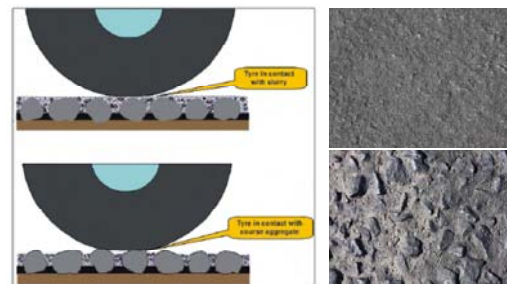
- Fine slurry applied by hand
 - Labour based methods preferred
 - Force slurry into voids of the seal
 - Follow undulations in the seal



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Cape Seal




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Slurry



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Slurry / Microsurfacing



- Seal repairs
- Covering geotextile patches
- Initial seals
- Rut filling (up to 30mm)




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Slurry/Microsurfacing

- Texture regulation
 - Highly textured surface > 1.0 mm
 - Uneven surface
 - Depends on aggregate interlock
- Repair edge breaks
 - More economical than manual methods

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Slurry/Microsurfacing

- Slurry – mostly anionic emulsions, 80/100 pen
- Microsurfacing – latex modified, 60/70 pen

Property	Unit	Test Method	Class	
			AC-E1 (Overlay)	AC-E2 (Rut filling)
Binder content (m/m)	%	MB-22	62-65	62-65
Residue on sieving* (/100 ml)	710µm sieve	MB-23	≤ 0.1	≤ 0.1
	150µm sieve		≤ 0.5	≤ 0.5
Particle charge		MB-24	positive	positive
Sedimentation after 60 rotations	°C	SANS 309	nil	nil
Recovered binder residue		MB-20¹		
Softening point ²	°C	MB-17	≥ 48	≥ 55
Elastic recovery @ 15°C	%	MB-4	≥ 50	≥ 55

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Slurry Issues

- Embedment when seals are applied over fresh slurry.
 - Curing period of 12 weeks.
 - Ball penetration values less than 2mm.
- Bleeding when slurry is applied over an existing flush surface or when applied over a cutback seal
- Rapid reflection of active cracks from the underlying surface

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Ultra Thin Friction Course

- UTFC – 18 to 25mm thick high texture course
- Agrément South Africa
 - Accreditation system
 - Asses past performance and quality control process
 - Issue certification with follow up monitoring
- Performance criteria (texture, skid...) and 3 year warranty

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Summary

- Preventative maintenance practiced rather than on a worst first basis.
- Successful use of crumb rubber spray seals on heavily trafficked roads.
- South African seal types may provide benefits in Australia
- Rejuvenation is a widely accepted practice that can extend the life of a seal by 3 – 4 years.



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Short Life Seal



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End of Part 2



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