

Update on Performance Graded Binder Specifications for SA

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Road Pavements Forum

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RPF Resolution : 5 of Nov 2003

- *That the Bitumen Specifications Working Group be reconvened with the objective of reviewing the South African binder specifications relative to international trends of Performance Grading (PG), including the fingerprinting of various South African crude source binders using the American PG System*

Which way do we go??

Bitumen Stiffness (SBIT) : 1

Select Calculation Method

- Softening
- Softening **Virtual Rheometer** temperature
- Use 2 x Penetration
- Penetration Index

Input Parameters

Parameter	Unit	Range	From	To	Step
Time of Loading	Seconds	<input type="checkbox"/> ?	02		
Bitumen Temp.	°C	<input type="checkbox"/> ?	20		
Softening Point (T800Pen)	°C	<input type="checkbox"/> ?	52		
Pen Value	0.1mm	<input type="checkbox"/> ?	50		
Pen Temp.	°C		25		

Results

Bitumen Stiffness	MPa	33.500
Penetration Index	-	-0.7

Results Table Results Report Help Cancel

2003

Way forward??

(2012)



Findings of PG Spec Workshop 29 Nov 2012 at Stell University₁

- DSR is useful for:
 - Quick process control tests (Jacques vH)
 - Binder sample size (much less)
 - Repeatability & reproducibility (vs Pen $T_{r\&b}$)
 - Compaction: viscosity (cone & plate EU, cup & bob-spray), η_{mastic} at low shear rates
 - Workability: viscosity η is good measure
 - Thermal cracking: is an issue (industry says)
 - PAV: small binder samples, enough ageing?

Findings of PG Spec Workshop 29 Nov 2012 at Stell University₂

- DSR is useful for:
 - PMB evaluation, one spec in USA (In SA, PMBs for SANRAL ~ 70%, design method?)
 - Same test framework possible for Seals, just limits differ (USA experience)
 - Accessible: already 5 in SA industry (+PAV)
 - Training: CSIR (Jorge Mturi) has capacity
 - Fingerprinting: CSIR and SU SA binders meet Shrp PG specs ($G^*_{25^{\circ}\text{C}, 0.4\text{Hz}} = \text{Pen}$)

Way forward from PG W'shop₁

- Reconstitute WG on PG specs of RPF
- Consider issues for SA such as:
 - Client driven: DSR testing specified
 - In time, approve of test methods SANS (DSR)
 - Adjust test limits for SA (diff HMA vs Seals)
 - Formalise training programme
 - DSR user group: database
 - Transition period (2+ years) // Pen T_{r&b}

Way forward from PG W'shop₂

- Consider issues for SA such as:
 - PAV: adopt, but not harsh enough (~3yrs?)
 - RTFO for seals?
 - Rut: Build test data J_{nr} rather than $G^*/\sin\delta$
 - Consider J_{nr} stress levels than AASHTO TP70
 - Fatigue: Critical Yield stress rather than $G^*\sin\delta$ (lower than IT? 3600° is it realistic?)

Way forward from PG W'shop₃

- Consider issues for SA such as:
 - Bitumen rubber: JO'C identify critical findings from USA and EU,
 - BBS for adhesion/cohesion
 - Storage stability: based on $G^*/\sin\delta$ vs J_{nr}
 - Climate, traffic and long term in-service (age)

Proposed WG on PG Specs

- Piet Myburgh
- Johan O'Connell
- Johan Muller
- Dennis Rossmann
- Kim Jenkins
- Bob Hornsey
- Jacques van der Merwe
- Deon Pagel
- Dr Lucas Ebels
- Tony Lewis
- Steph Bredenhann
- Martin van de Ven
- Saied Solomons
- Benoit Verhaeghe
- Willem Lofsink
- Pieter van Nortjie
- Kobus Louw
- Herman Marais
- Joe Grobler
- Krishna Naidoo
- Hennie Loots
- Elsabe van Aswegen

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Reconsideration

Finally...resolution



Bloupunt
Cogmanskloof

