Bitumen specifications

Trevor Distin

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SANS specifications

SANS #	Product	Last amendment
307	Penetration grade bitumen	Dec 2006
308	Cutback bitumen*	1973
309	Anionic bitumen road emulsions	Nov 1986
548	Cationic bitumen road emulsions	1972
1261	Invert bitumen emulsion	1979

* Currently under review to introduce MC 10

Latest changes to SANS 307

- Increased min viscosity limit at 60°C
  - 120 to 140 Pa.s
- Reduced mass change limit after RTFOT
  - 0.5 to 0.3 % max
- Reduced change in R&B softening point limit after RTFOT
  - 9 to 7 °C max
- Caveat on bitumen for modification

Outstanding issues

- In 2004 the consensus of RPF bitumen task team was that there was a need to:
  - Implement PG system based on climate & traffic using SABS 307empirical tests
  - Develop long term ageing test
  - Develop low temp adhesion/cohesion test
  - Protocol for retention samples
- RFP bitumen task team last met in April 2005 to agree latest spec changes

What has happened since

- Bitumen Quality Management seminar in Sep 2005
- Sabita published Manual 25: *QM in handling & transportation of binders* in 2006
- Finger printing of SA bitumen against Super Pave specs in 2006
- K Jenkins & H Bahia held workshops in 2007 on PG specifications
- CAPSA 07 presentation on the harmonisation of EU bitumen specifications
- Second BQM seminar in Oct 2008

Why not Performance grading?

- Cost of Super Pave testing equipment not affordable
- Concern over proliferation of grades required
- Same test regime required for all binders & uses not achievable
- Should rather focus on final product performance properties

Bitumen Quality Management seminar

- Held from 7 - 9 Oct in Vanderbijlpark
- Follow up from BQM held in Sep 2005
- Attended by 54 delegates
- 2 overseas bitumen experts invited as presenters
  - Mike Southern & Simon Watkins
- Perceptions audit to canvass views of experts

ASPHALT ACADEMY

Recommendations from BQM

- RPF bitumen task team should be reconvened to consider:
  - Developing PG specs
  - Widen penetration ranges to bring them in line with accepted precision limits
  - Adjust viscosity limits at 60°C to bring them in line with global specs
  - Develop a long term durability test

Comparison of specs

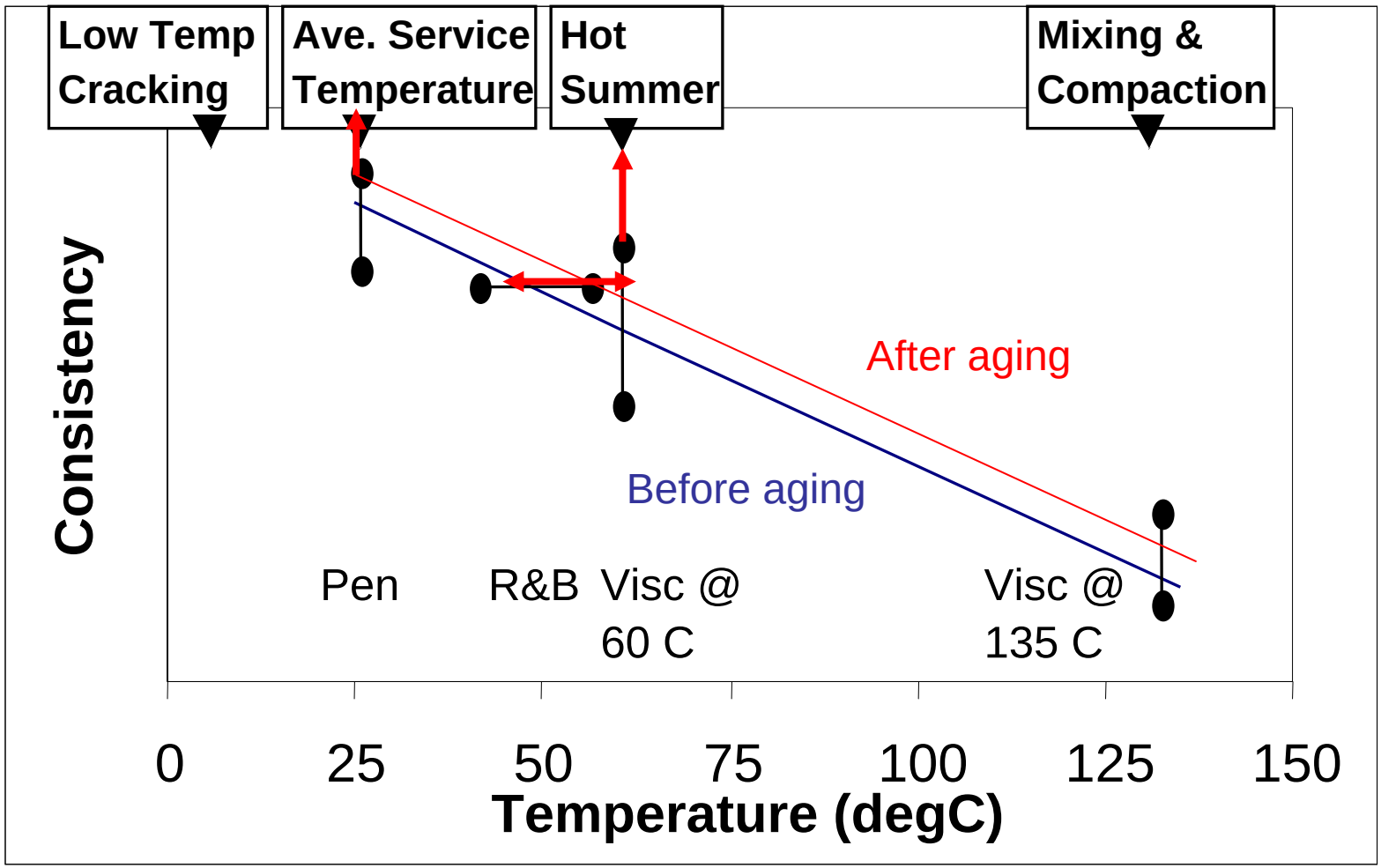
Penetration ranges @ 25 °C

	40/50	60/70	80/100	150/200
RSA	40/50	60/70	80/100	150/200
CEN	35/50	50/70	70/100	160/200
Australia	40 min	62 min		130 min

Viscosity ranges @ 60°C

	40/50	60/70	80/100	150/200
RSA	220 - 400	140 – 250	75 - 150	30 - 60
CEN	225 min	145 min	90 min	30 min
Australia	260 - 380	140 - 200		40 - 60

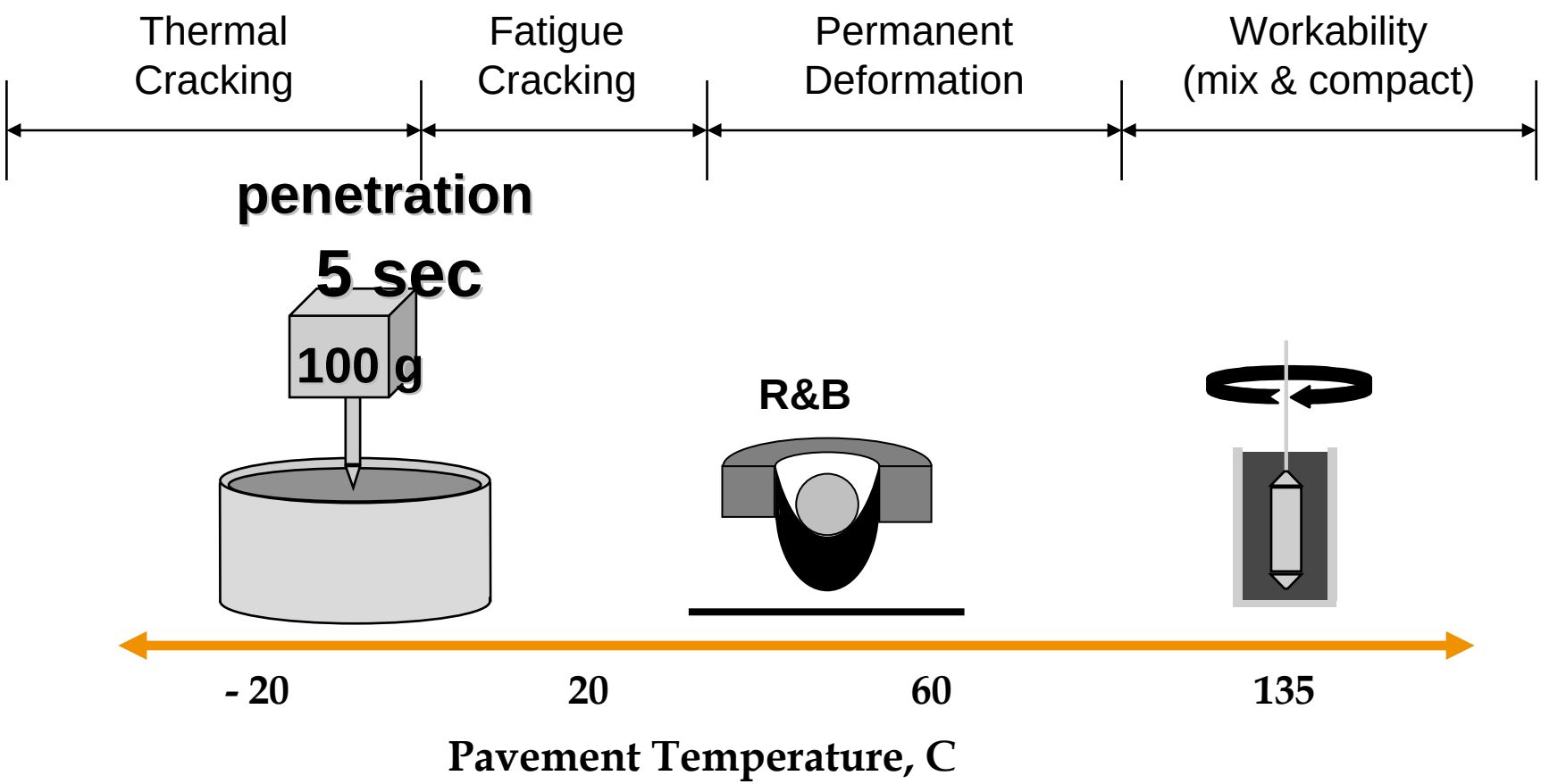
SANS 307 framework



Development of PG specs

- A draft PG grading system should be developed and run in parallel to the current bitumen classification and specifications;
- Empirical tests should be used to determine performance properties;
- Climatic data should be used to determine pavement temperature ranges (CSIR's Themopads programme)

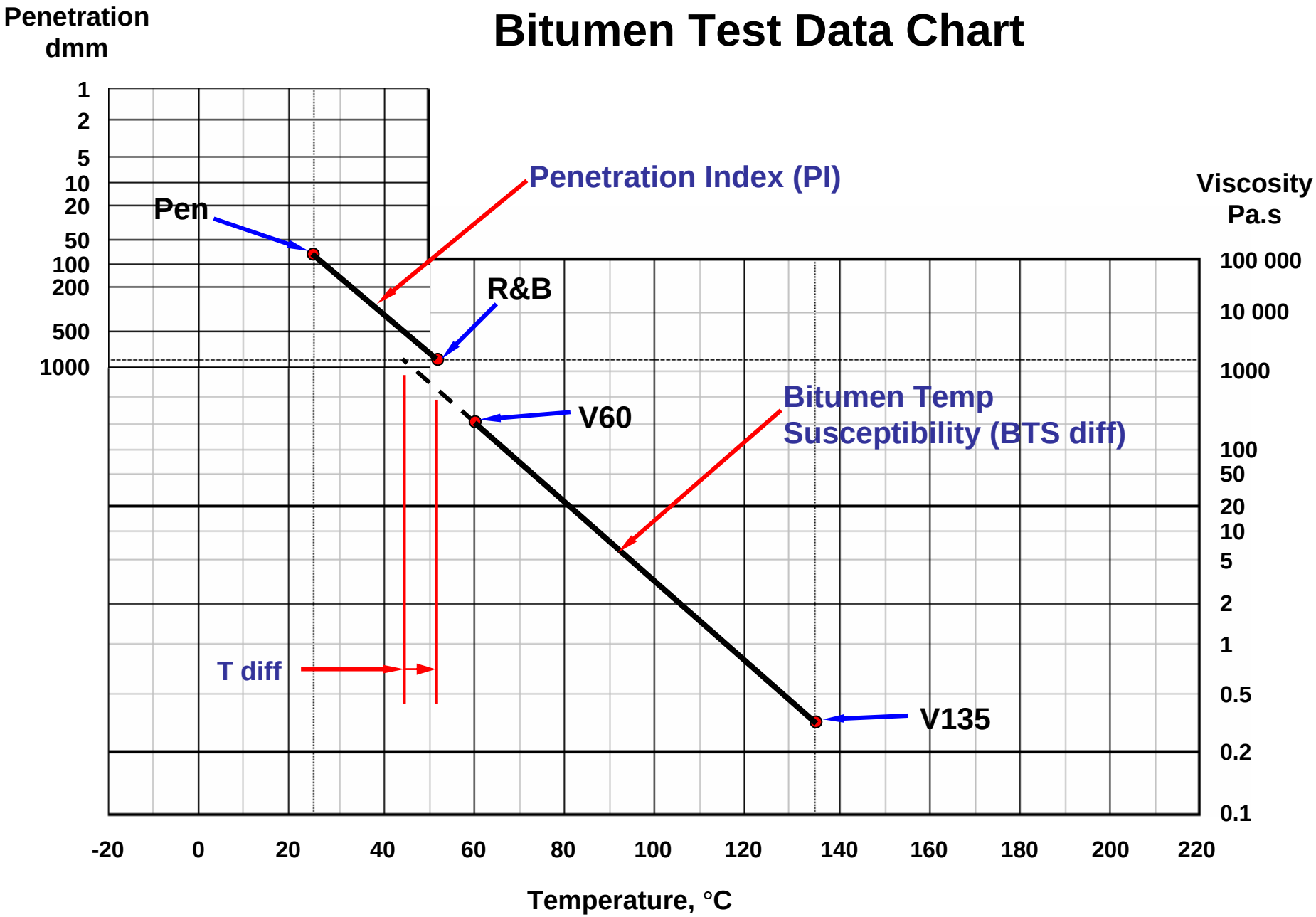
Performance Grading



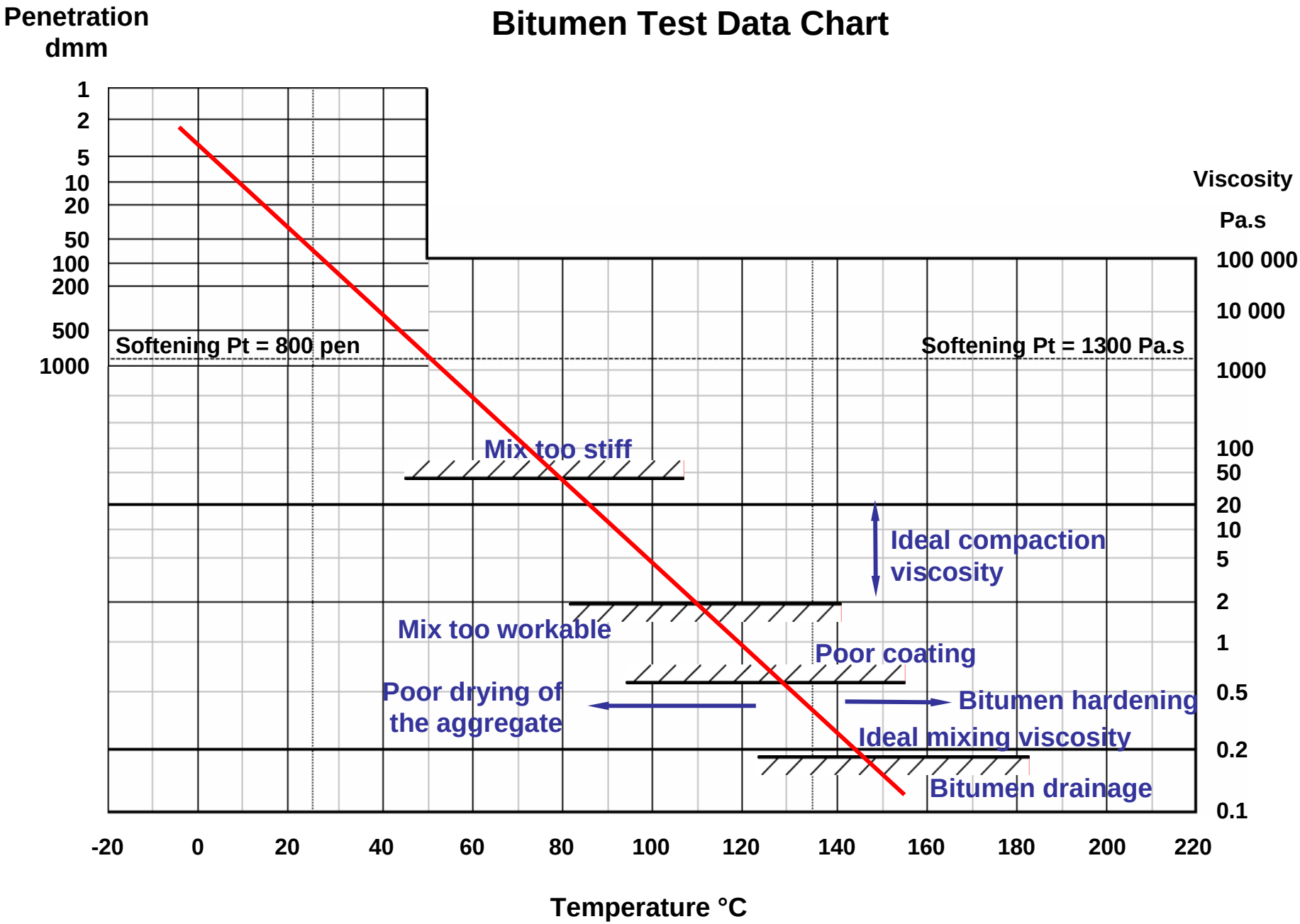
Other considerations

- The Bitumen Test Data Chart should be used for plotting test results
- A decision making tool for the selection of binders should be developed
- Sabita to coordinate a programme to correlate testing between binder production and user laboratories;

Bitumen Test Data Chart



Bitumen Test Data Chart



Way forward

- Reconvene the Bitumen task team to:
  - Review the SANS 307 specs wrt to penetration and viscosity ranges
  - Develop a framework for PG based on empirical tests and climatic data
  - Development of a long term ageing test
  - Develop a binder selection guide
  - Make recommendations on using BTDC
  - Finalise draft SANS 308 specs

Task team members

Refineries

- S Coe (Chevron)
- M Zacharias (Shell)
- T Pringle (BP)
- R Muthusamy (Engen)
- J Van Heerden (Sasol)

Secondary producers

- J Muller (Tosas)
- K Louw (Colas)
- H Marais (Much Asphalt)

Clients

- D Rossmann (SANRAL)
- O Ukermans (GDPTRW)

Consultants

- J Grobler (VKE)
- W Hofsink (Africon)
- J O'Connell (CSIR)
- K Jenkins (US)
- B Verhaeghe (CSIR)