

Development of Performance-Related Binder Specifications



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Overview

- What are performance-related specifications?
- What are the problems with the current Superpave binder specification?
- How are we addressing these problems?
 - Examples
- Conclusions



What are performance-related specifications?

■ Performance-Based

- Test parameters selected to predict pavement performance
- Should guarantee a certain level of pavement performance
- Asphalt binder as well as other components such as aggregates, mix-design etc. are considered



What are performance-related specifications?

■ Performance-Related Specifications

- Capture The *Relative* Contribution of Asphalt to Hot-Mix Asphalt (HMA)
 - Performance models basis for specification parameters
 - Averaged Damage-Weighted Functions
 - » Environment
 - » Traffic Conditions
 - » Pavement Structure
 - Laboratory calibration
 - Field Validation



What are performance-related specifications?

■ Performance-Related Specifications

- Asphalt binder cannot solely predict hot-mix pavement performance!
 - Purchase Specification
 - Other components such as aggregates, mix-design etc. are important
 - Construction quality also important
 - Interactions not considered
 - *Guide for selecting asphalt binder with the best cost-to-performance ratio*



What are the problems with the current Superpave binder specification?

- Single point criteria
 - Easy to fool
 - No performance models for various distresses
 - Proliferation of Specifications
 - Descriptive specifications
 - Superpave plus!



What are the problems with the current Superpave binder specification?

- Known or perceived trouble areas:
 - Performance of polymer modified asphalts
 - Chemically modified asphalts, e.g., blown
 - Physically inhomogenous asphalts, e.g., TLA
 - Intermediate temperature properties



How are we addressing these problems?

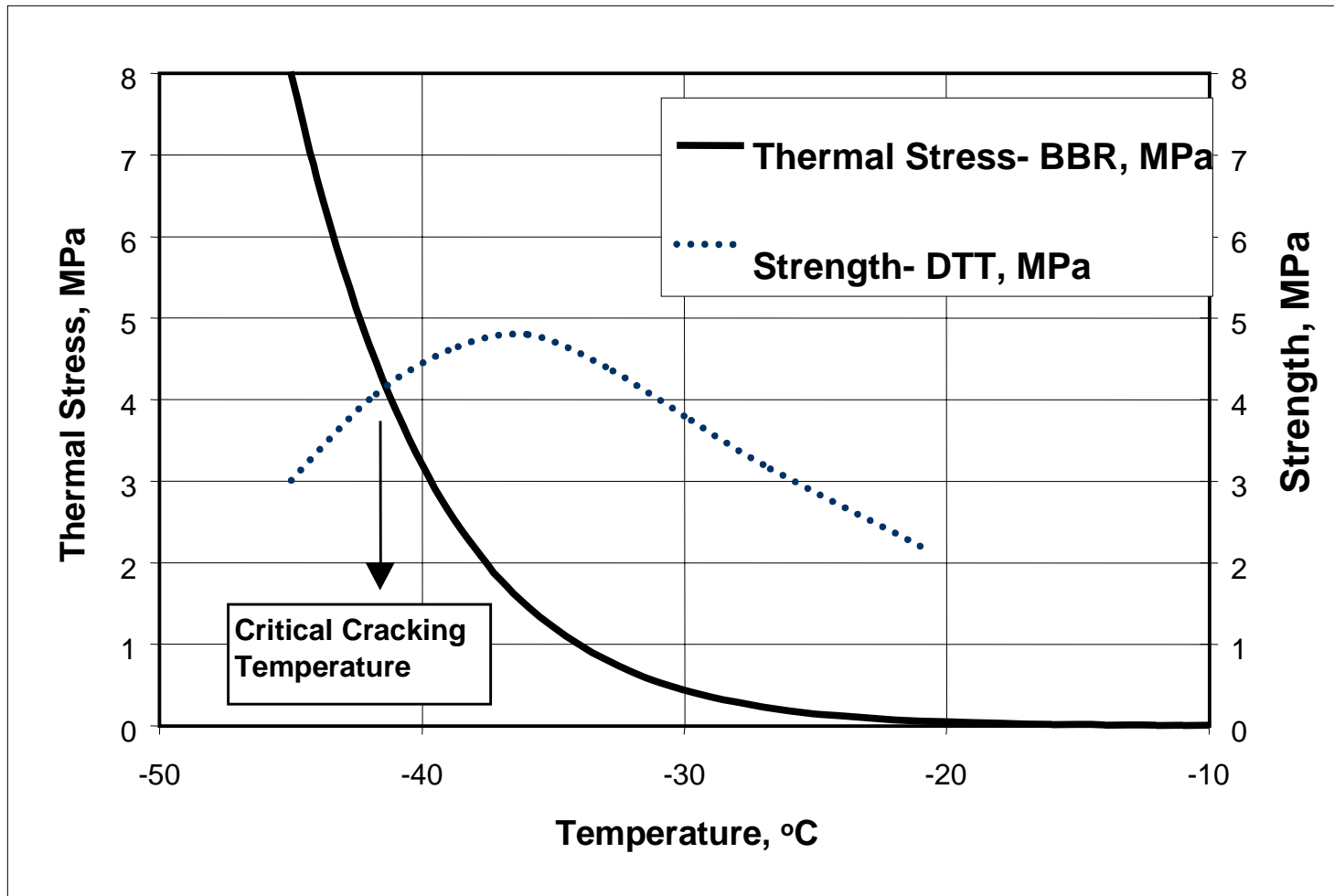
- ETG has formed a Subtask Group to address specification improvement efforts
 - Low Temperature Parameters
 - DTT equipment
 - MP1A development
 - Task completed and AASHTO approved
 - High Temperature Parameter
 - Evaluating repetitive creep test
 - Evaluating parameter values
 - Evaluating temperature damage weighting
 - Task ongoing
 - Goal: 1st revisions for next year's AASHTO meeting



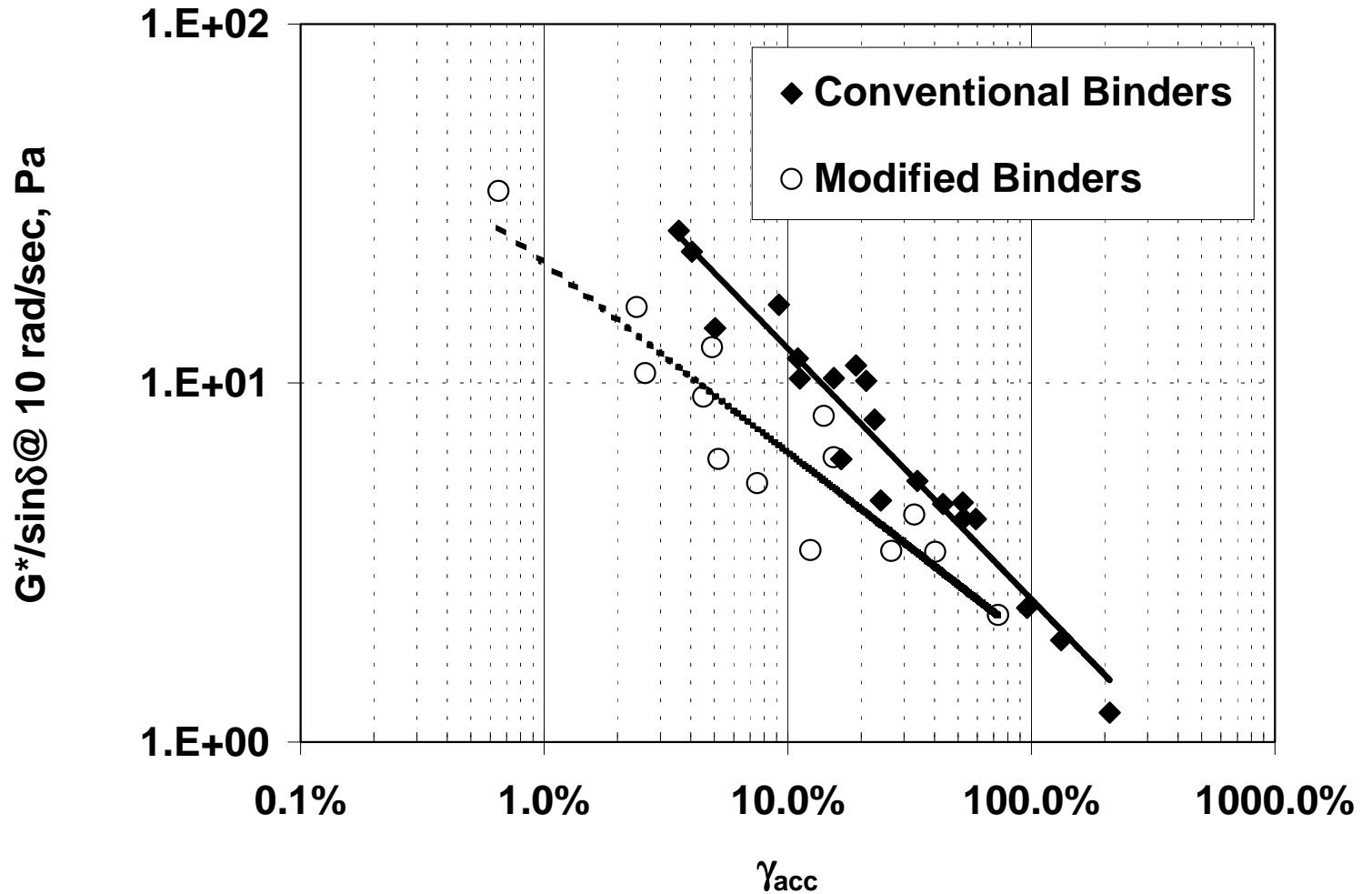
How are we addressing these problems?

- ETG has formed a Subtask Group to address specification improvement efforts
 - Intermediate Temperature Parameter
 - Probably next target
 - Other issues:
 - Low temperature thermal fatigue and fracture
 - Binder definition

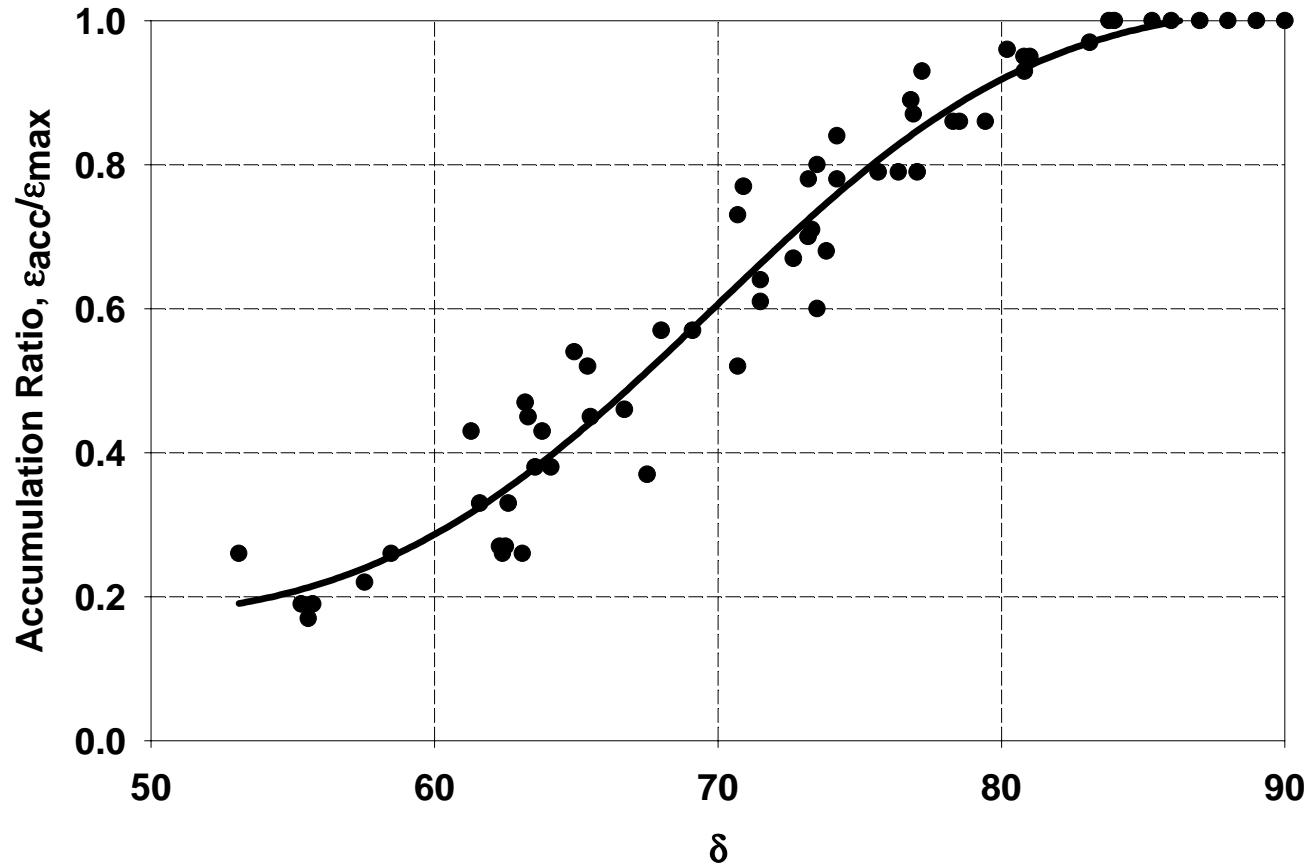
Low Temperature Specification



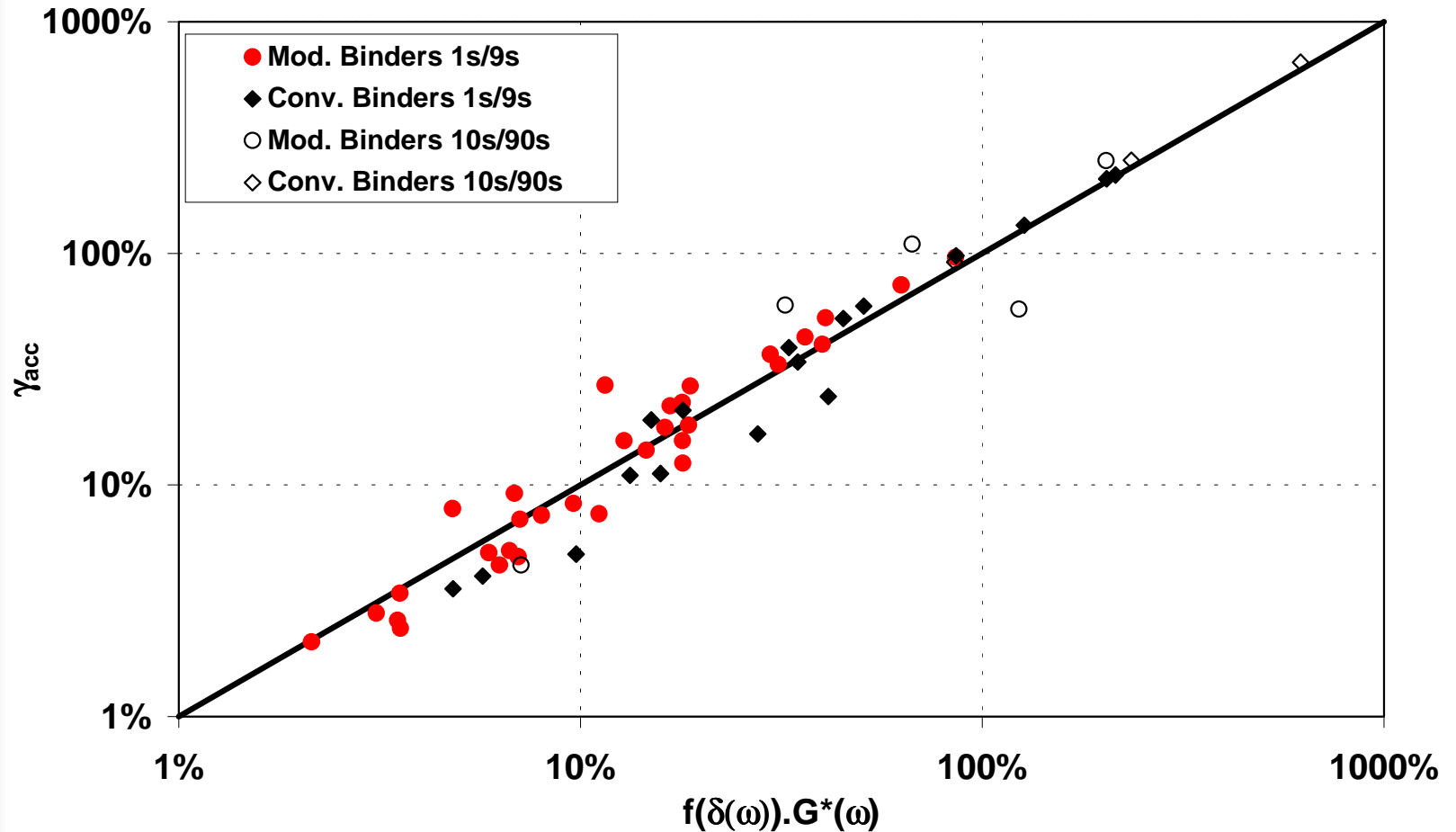
Example: Hi T Spec



Example: Hi T Spec



Proposed High Temperature Parameter





Conclusions

- Superpave binder specification 1st performance-related specification.
- Specification still limited.
- Specification is being continuously improved.
- Changes will happen and suppliers must be prepared to see changes in the coming years that will impact binders.