How to assess durable materials for long-lasting pavement?

Field validation cracking??

- Effective binder performances “ranking”
- Realistic ageing impact on binders
- Distinguish long lifespan binder VS insidious ones
- Huge investigation and time consuming
- Materials quantities
- Experiment field availability

Figure 1: Field follow-up of cracking amplitude after 4, 7, 10... and 19 years

Laboratory ageing procedures and test methods investigation

- Time and labour cost-effective
- Reliable test methods with respect to ageing
- Catch binder performance with respect to ageing

Figure 2: Laboratory TSRST test method for asphalt mixture

Figure 3: Binder pathway assessment

Results & Discussion

Ageing impact: Fraass trend ≠ TSRST (control)

Ageing impact: ABCD trend ≠ TSRST (control)

Ageing impact: BBR trend = TSRST test method (control)

The truth according to the “Ageing vector criteria”

- p < 1: binder test method underestimates TSRST « ageing sensitiveness »
- p > 1: binder test method overestimates TSRST « ageing sensitiveness »
- p = 1: binder test method suit TSRST « ageing sensitiveness »

Figure 2: Laboratory TSRST test method for asphalt mixture

Figure 3: Binder pathway assessment

Figure 4: Binder test methods for bituminous binders

S criterion, BBR underestimates (but with uniformity) TSRST ageing sensitiveness

Conclusion & Prospect

- Improve reliability and accuracy of this assessment
- Enlarge investigation and database with extended binders to validate this method