KRIZ | AT
ASPHALT TECHNOLOGY



CUPGA · CTAA 2026

Do specifications limit technology adoption?

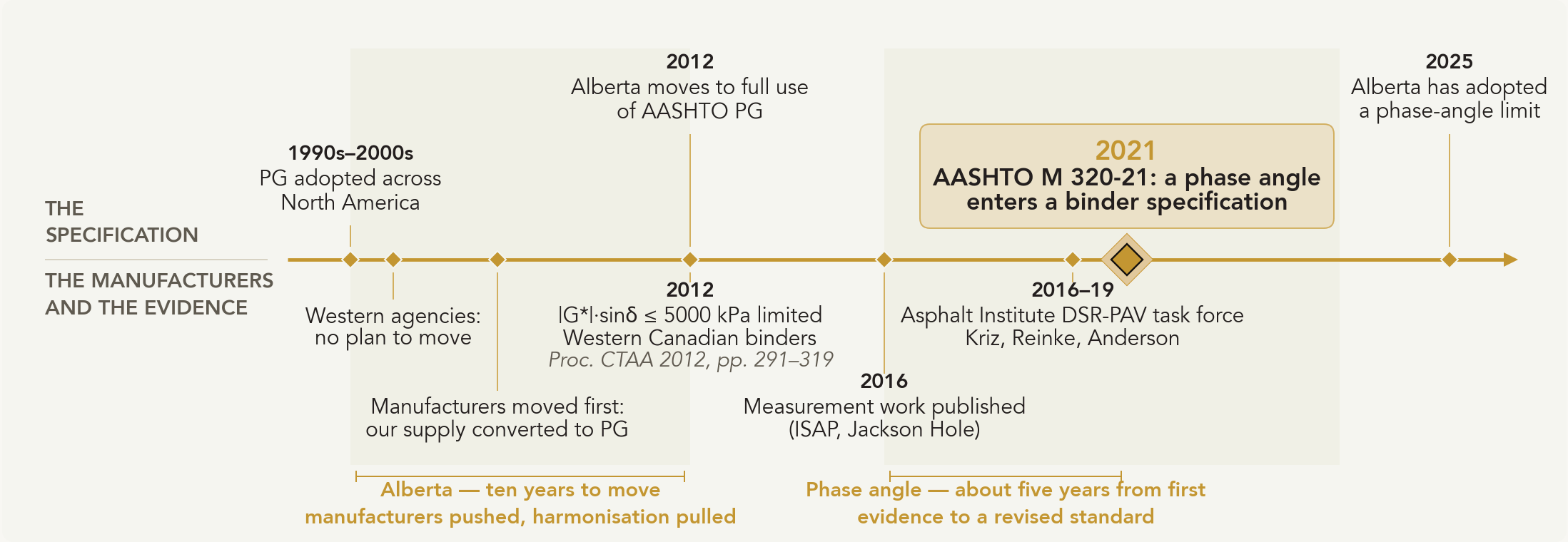
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Saskatoon, SK · 15 November 2026

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My experience with changing the binder specifications



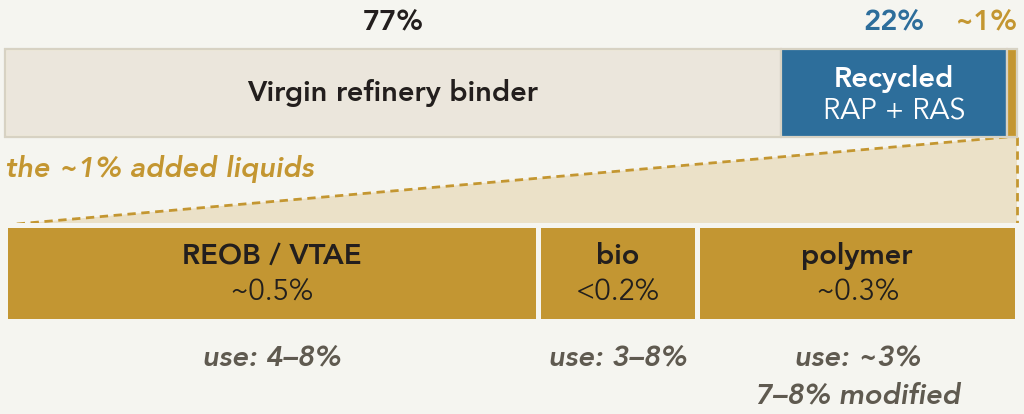
Two changes. Neither was limited by the science.

Kriz *et al.*, "Transition to Superpave Performance Grades in Western Canada", *Proc. CTAA* 2012, pp. 291–319. Kriz *et al.*, ISAP 2016, Jackson Hole WY, Paper 33. AASHTO M 320-21, Table 1, footnote *e*: 6000 kPa maximum with a 42° minimum phase angle, the angle floor waived below 5000 kPa. · © 2026 Pavel Kriz / Kriz Asphalt Technology. No proprietary data used. Views are the author's own.

The chemistry tracks the relaxation.

WHY THE QUESTION IS LIVE AGAIN

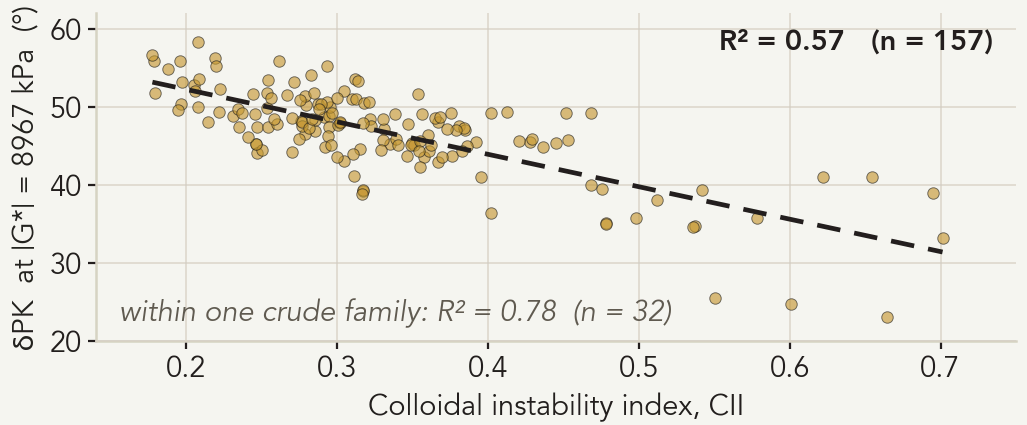
NORTH AMERICAN BINDER POOL



About 23% of the binder in North American roads is no longer virgin refinery asphalt. Pool averages understate the dose actually in the mix.

WHAT THE CHEMISTRY STILL TELLS US

COMPOSITION → RELAXATION



Across 157 asphalts from crudes worldwide, composition tracks how a binder relaxes: the less stable the chemistry, the lower the phase angle.

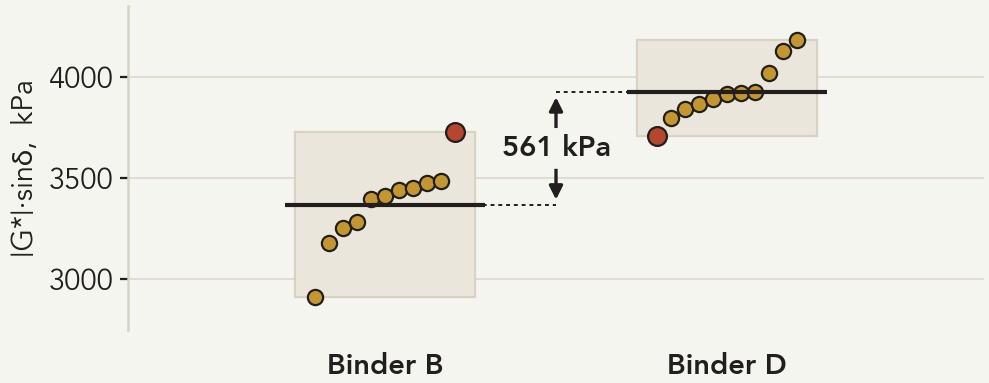
About 23% of the pool is no longer virgin refinery asphalt — and composition still tracks how it relaxes.

Left: NAPA *Asphalt Pavement Industry Survey* IS-138 (2023); FHWA-HIF-23-043; Asphalt Institute IS-235; FHWA-HIF-12-030. Right: P. Kriz, D. Campbell, L. Kucharek & S. Varamini, "A Simple Binder Specification Tweak to Promote Best Performers", *Proc. Canadian Technical Asphalt Association* Vol. 65 (2020), pp. 379–401, Figure 8 — 157 lab-distilled asphalts from globally sourced crudes, $R^2 = 0.57$. CII is the Gaestel colloidal instability index, (saturates + asphaltenes)/(aromatics + resins), from SAR-AD fractionation; δ_{PK} is the phase angle interpolated at $|G^*| = 8967$ kPa from routine intermediate-temperature DSR (AASHTO T 315). The within-family figure, $R^2 = 0.78$ on n = 32, is Fig 14 of P. Kriz *et al.*, *Proc. CTAA* Vol. 68 (2023): two base binders from one crude, by additive and ageing state.

A measurement can only sort what it can resolve.

|G*|·sinδ — THE SPEC PARAMETER

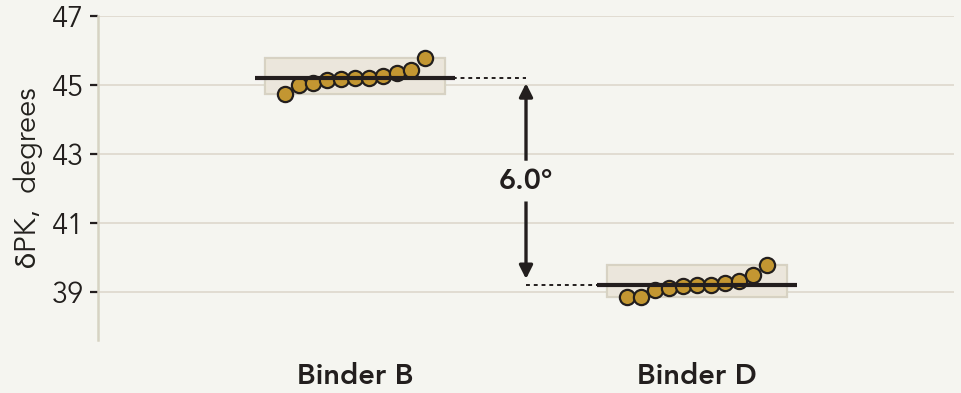
CV^R 6.7%



The clouds overlap: B's highest lab sits above D's lowest.

δPK — AT A FIXED MODULUS

CV^R 0.9%



Two tight bands, completely separated.

Eleven laboratories, two PAV-aged binders, three replicates — the same specimens, posted out and run to the same standard.

- A limit can only sort two binders if the difference between them is larger than the spread of the measurement itself.

Eleven laboratories, two binders. The phase angle separates them; at this condition the loss modulus does not.

Asphalt Institute DSR-PAV Task Force round robin. P. Kriz, "DSR-PAV Test Improvement", Asphalt Institute Technical Advisory Committee, December 2016. Eleven-laboratory means, AASHTO T 315, 8 mm plate at 1% strain; coefficients of variation by ASTM E691. Binders keep the study's anonymised letters.

Use the capability the industry already has.

THE READINGS A GRADING LAB ALREADY HAS

TEMPERATURE	MODULUS |G*|	ANGLE δ
16 °C	6 788 kPa	46.9°
δ at the anchor stiffness *linear interpolation on a semilog scale*	**8 967** kPa	**45.2°**
13 °C	10 141 kPa	44.5°

The phase angle is not a second test. It is a reading taken from the measurement the laboratory already makes.

WHAT IT ASKS OF A LABORATORY

01 The instrument is already on the bench

Every laboratory grading to AASHTO M 320 runs this sweep today, on this specimen, at these temperatures.

02 No new test and no new standard

The value is read from standard T 315 measurements, at two or three temperatures bracketing the anchor stiffness.

03 The added effort is one temperature

Not a new rig, not a new preparation, not a new accreditation — one more point in a sweep already being run.

The best technology to adopt is the one already sitting on the bench.

Asphalt Institute DSR-PAV Task Force. The value is read from standard AASHTO T 315 measurements (10 rad/s) at two or three temperatures bracketing the anchor stiffness — no new test. Shown: inter-laboratory means for one binder, 8 mm plate at 1% strain.

Built on four pillars, a specification invites new technology.

01

Correct science

The property measured is the one that governs how the pavement actually fails.

02

Efficient

Acceptable in time and in cost, on the instrument the laboratory already owns.

03

Reproducible

Two laboratories reach the same verdict on the same tank.

04

Field validated

Anchored to measured field performance, not to a laboratory number alone.

All four. Predictable for the producer, credible for the owner — and blind to how the binder was made.

The first three are set out in P. Kriz, "Future of Asphalt Binder Specifications", *Asphaltopics* "Last Word", Fall 2018 — science, practicality and reproducibility, with practicality restated here as efficiency in time and cost. Field validation is added here and is the author's own. · © 2026 Pavel Kriz / Kriz Asphalt Technology. Views are the author's own.