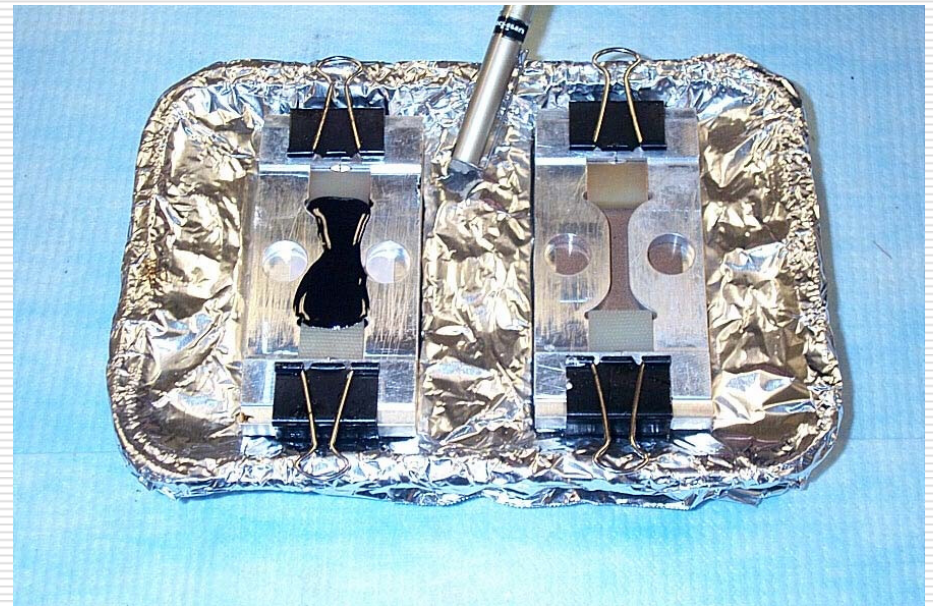
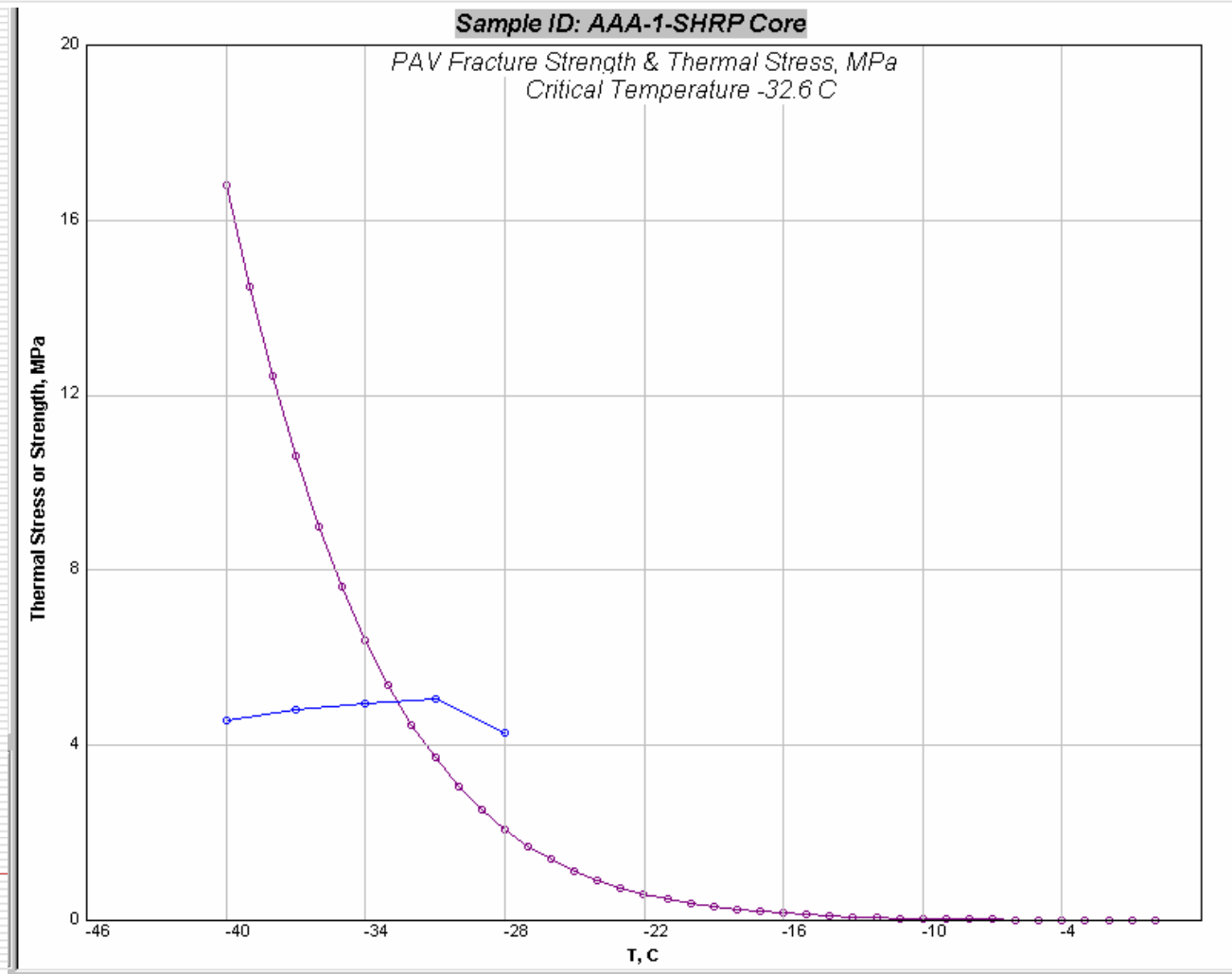


Direct Tension Test

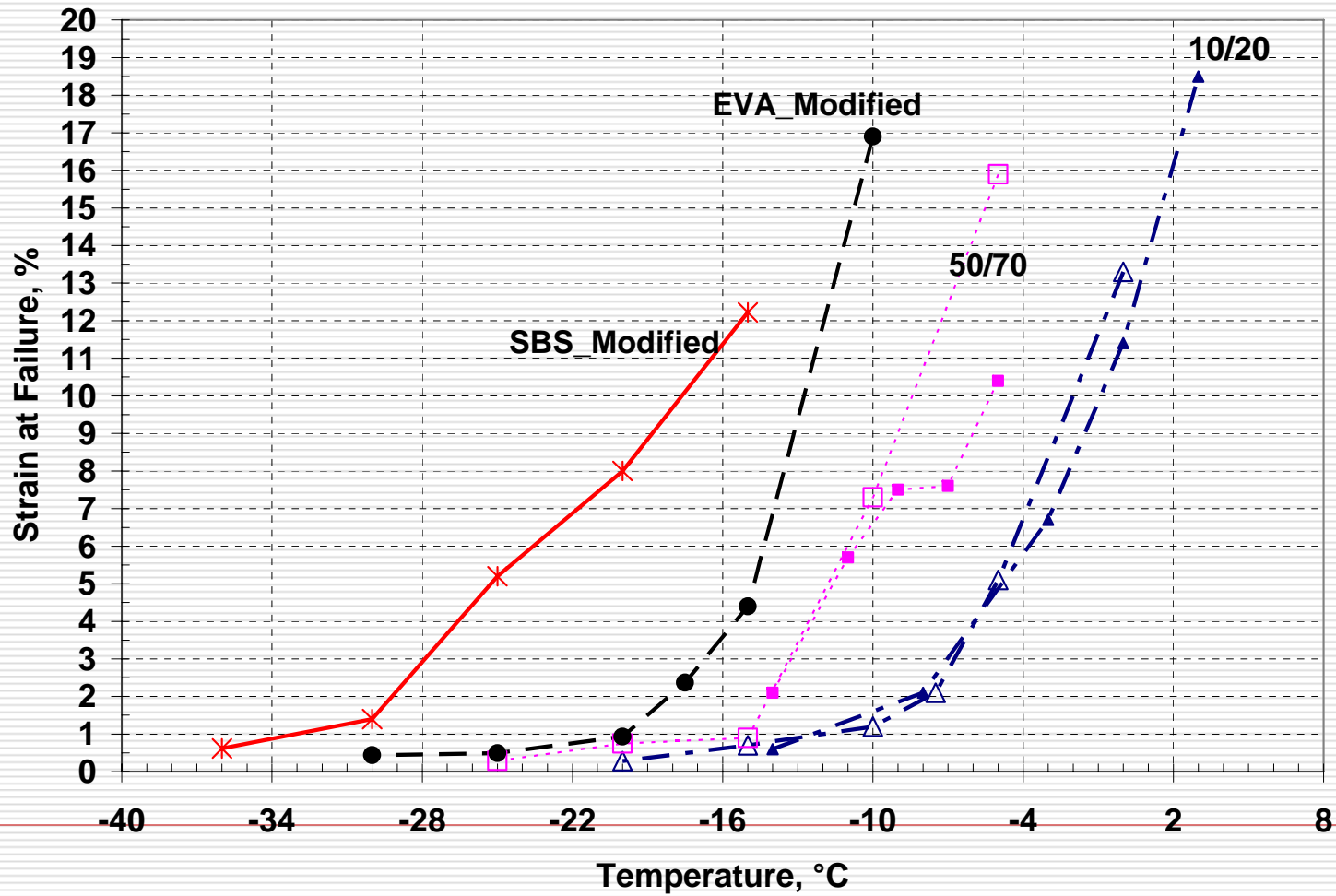


The Direct Tension Test provides a information on fracture and strain tolerance of the binder.

New low temperature binder Spec. Thermal stress compared to strength



Strain at Failure vs Temperature



Superpave Plus Specifications

- The Direct Tension Tester provides information on the strain tolerance and fracture properties of the binder.
 - The strain at $T_{cr} + 3^{\circ}\text{C}$ can tell a lot about what is in the binder.
-

DT Strains by Modifier Type

PG Grade	Modifier	Phase Angle	Tcr	Strain Tcr+3
76-23	Novophalt	82.4	-19	1.63
70-27	SBR/3%	75.2	-27	3.22
82-27	SBS/4.25%	63.6	-29	3.61
70-25	SBS/4%	73.8	-27	3.87
76-29	SB/6%	66.5	-29	3.60
70-24	-	87.6	-23	1.64
70-31	EVA GRF	79.1	-33	1.57
70-31	EVA	79.4	-31	1.94

PCCAS Binder Study

PG Grade	Delta Original	Tcr BBR	Tcr DTT	Strain Tcr+3
B – 1 65.7-23.8	86	-23.8	-22.8	1.27
B – 2 63.4-30.9	74.5	-30.9	-32.8	2.55
B – 3 66.1-29.7	86.7	-29.7	-30.5	2.25

Strain @ Failure for $T_{cr} + 3^{\circ}\text{C}$

