



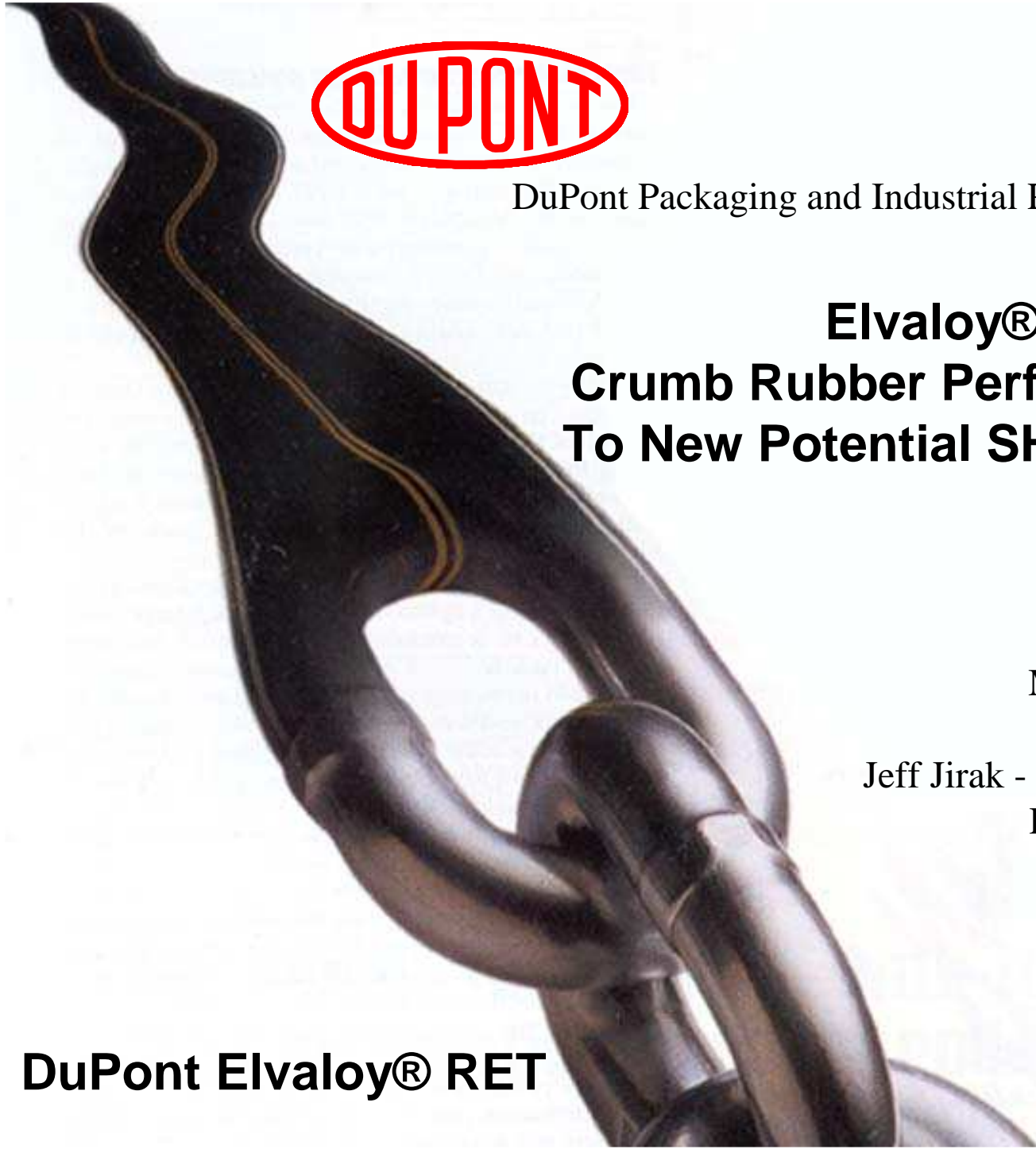
DuPont Packaging and Industrial Polymers

Elvaloy® RET & Crumb Rubber Performance Relative To New Potential SHRP Test Methods

May 9, 2001

Jeff Jirak - Sr. Technical Specialist
DuPont USA

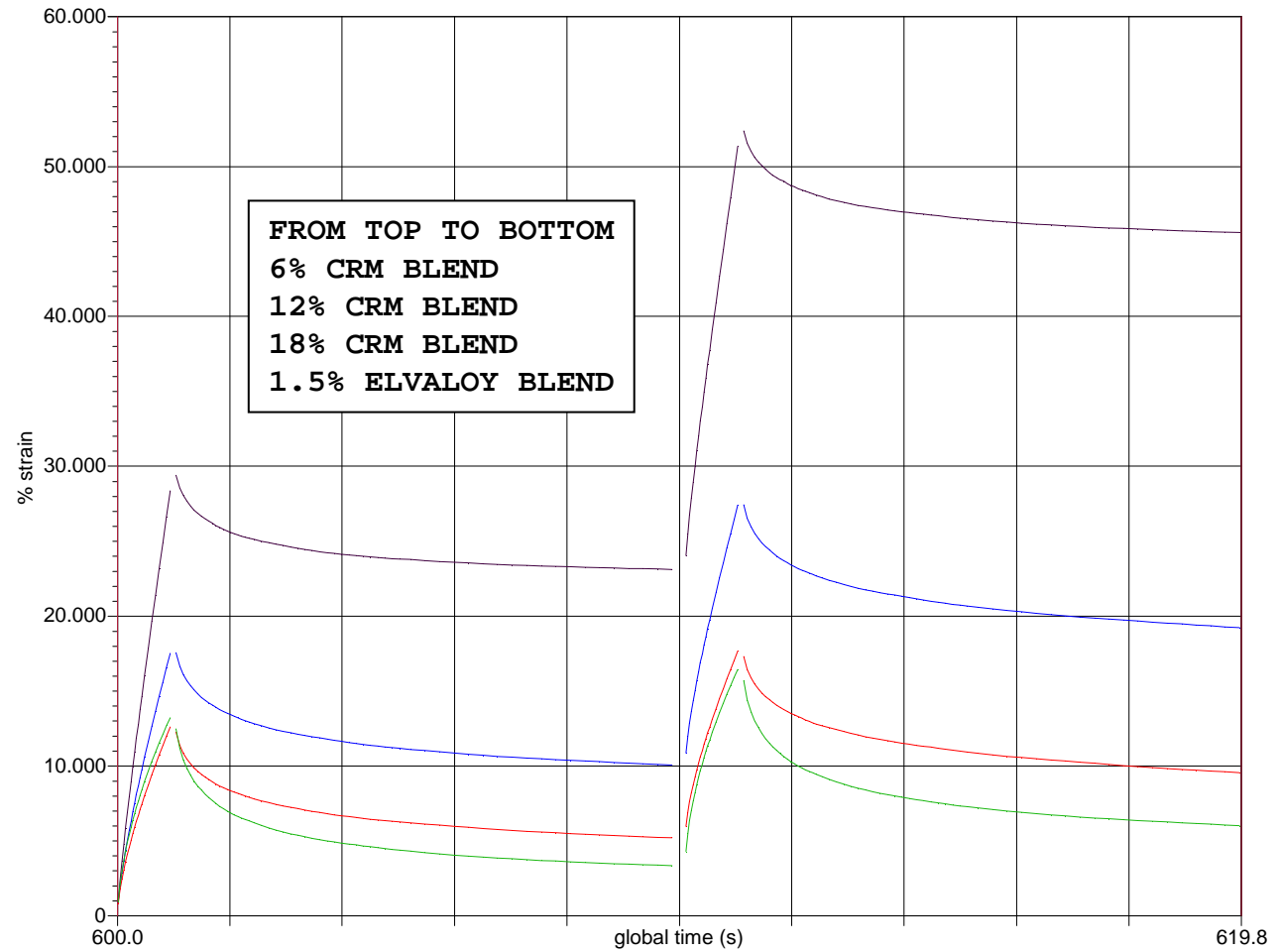
DuPont Elvaloy® RET





Elvaloy® RET
reactive elastomeric terpolymer

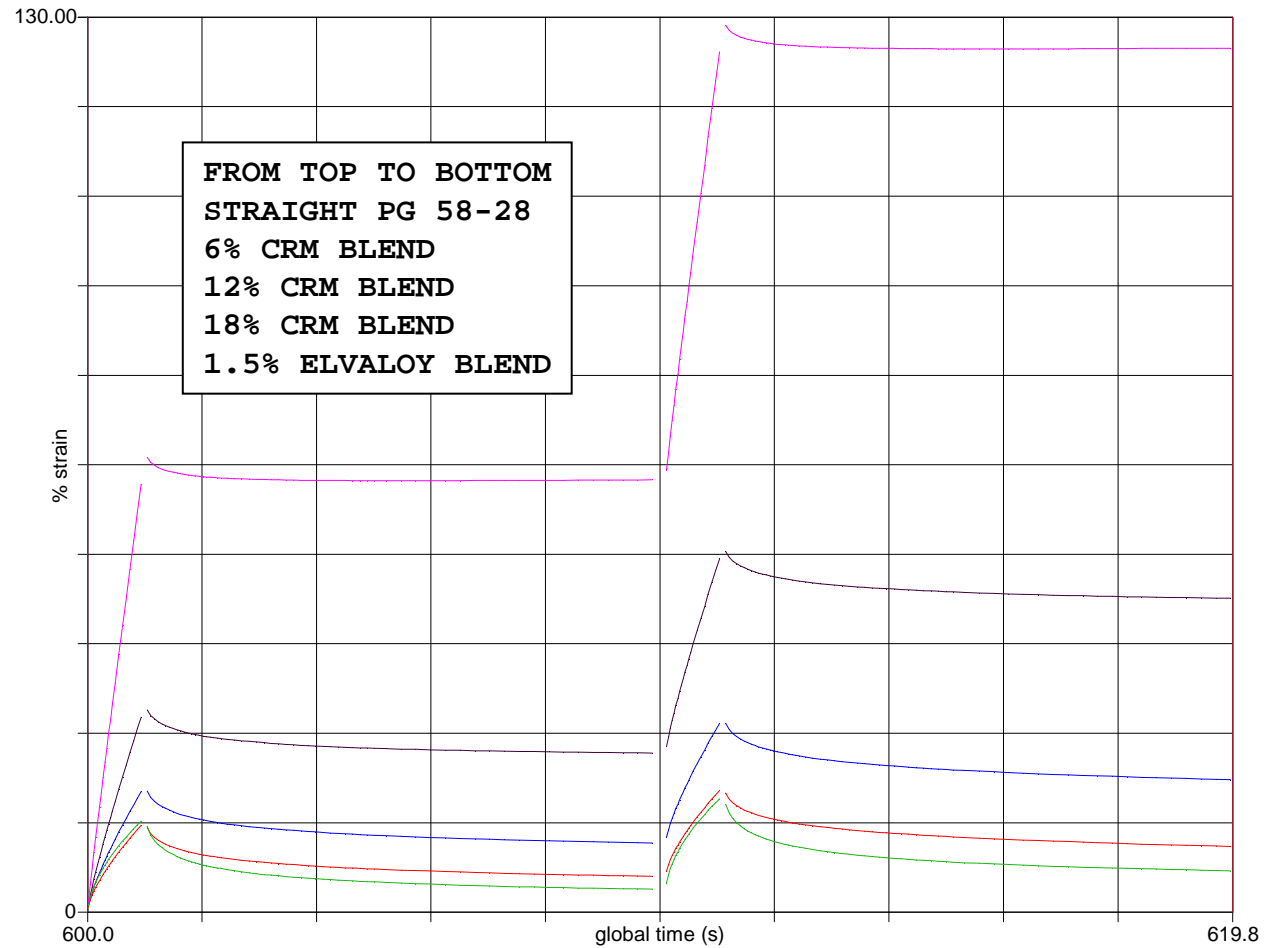
DH123B & 124A, MIF 58-28, 6% Rouse GF-80AE, 58°C, 300PA, CUM CRT





Elvaloy® RET
reactive elastomeric terpolymer

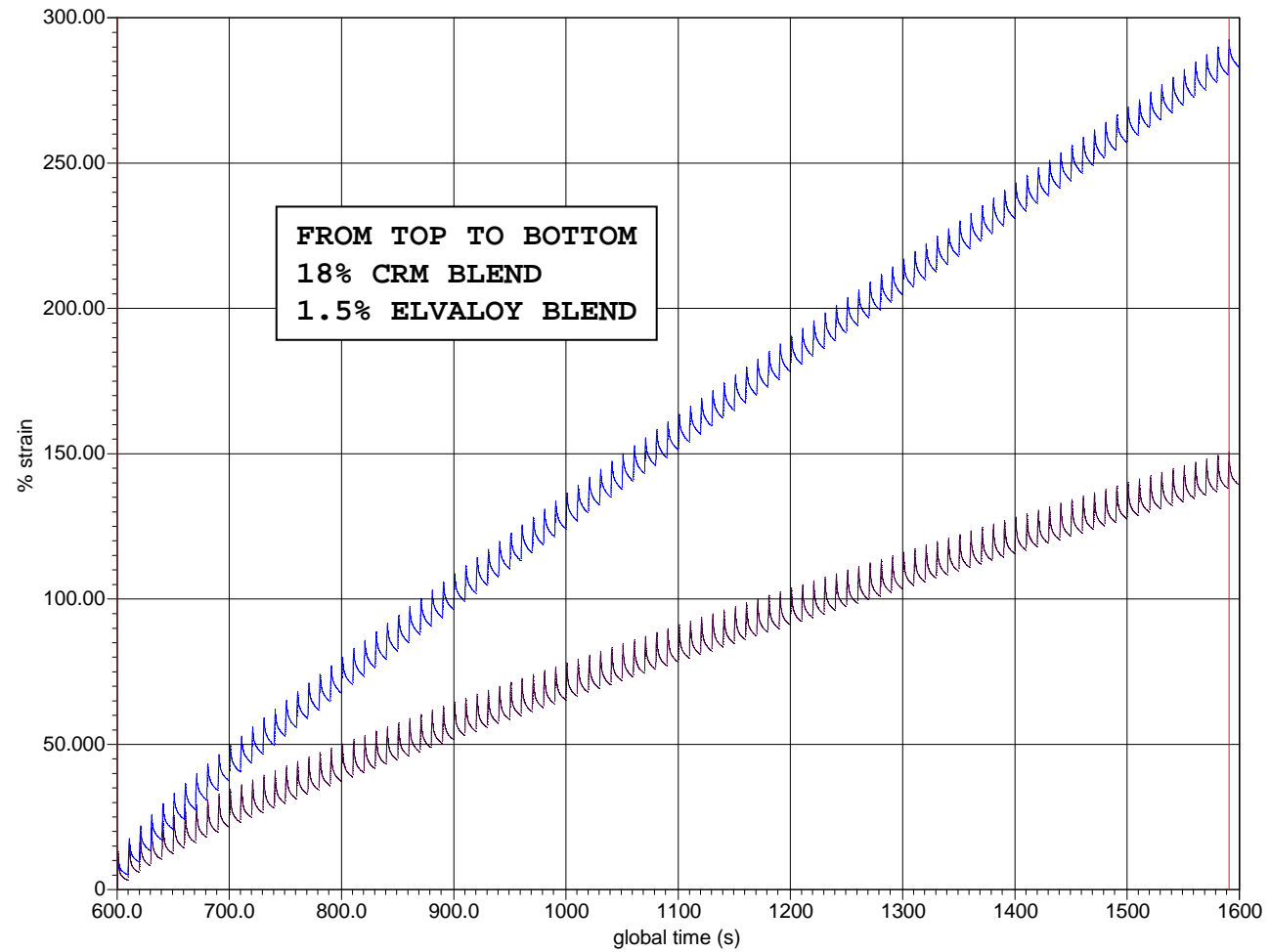
DH123B & 124A, MIF 58-28, 6% Rouse GF-80AE, 58°C, 300PA, CUM CRT





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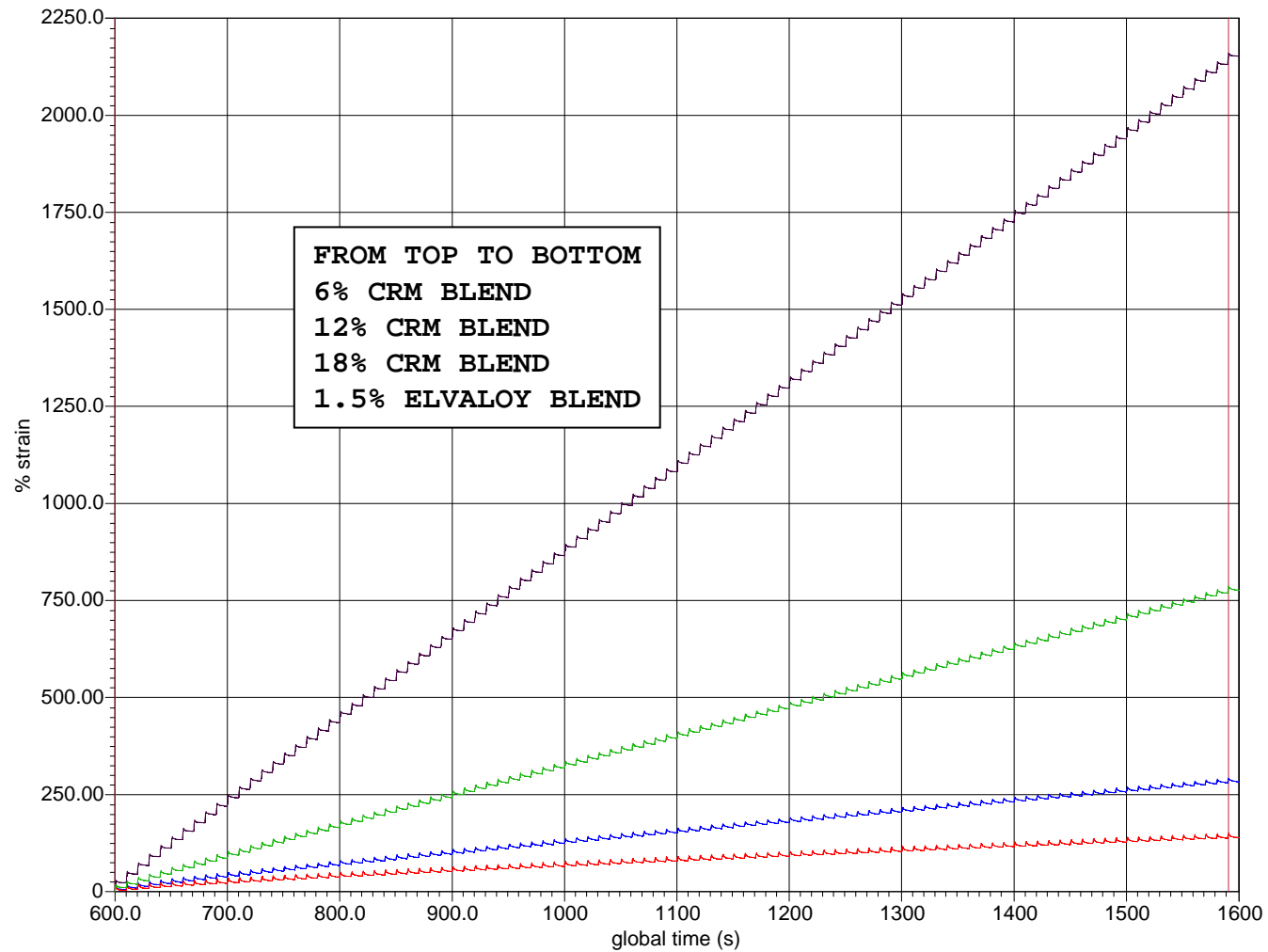
DH147C & 148A, MIF 58-28, 1.5% 4170, .5% SPA (105), 58°C, 300PA, CUM CRT





Elvaloy® RET
reactive elastomeric terpolymer

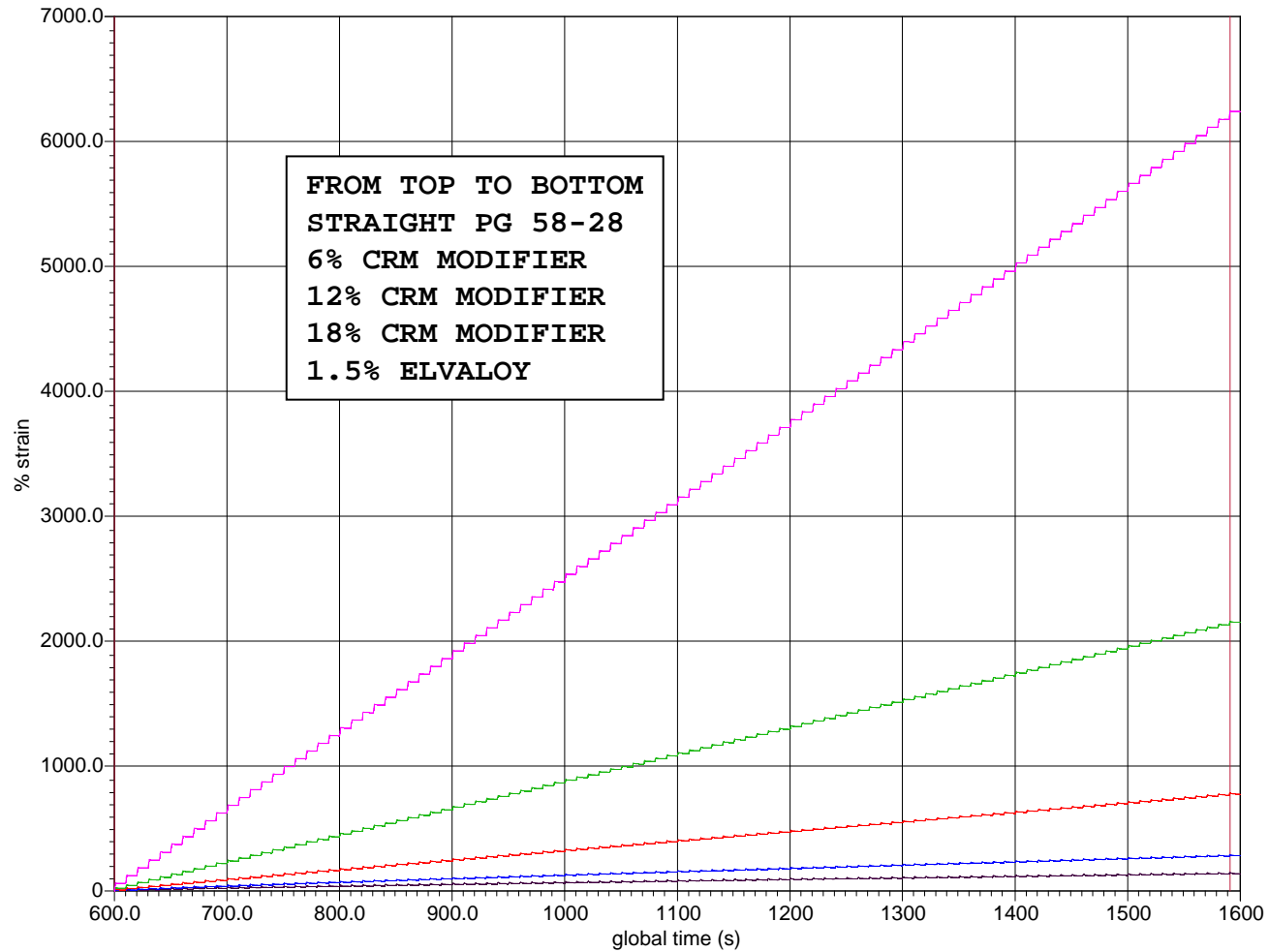
DH123B & 124A, MIF 58-28, 6% Rouse GF-80AE, 58°C, 300PA, CUM CRT





Elvaloy® RET
reactive elastomeric terpolymer

COMPARE PG 58-28 & MODIFIED BLENDS @ 58°C, 300PA, TOTAL CREEP





Elvaloy® RET
reactive elastomeric terpolymer

Crumb Rubber Mix Testing



Elvaloy® RET
reactive elastomeric terpolymer





Elvaloy® RET
reactive elastomeric terpolymer





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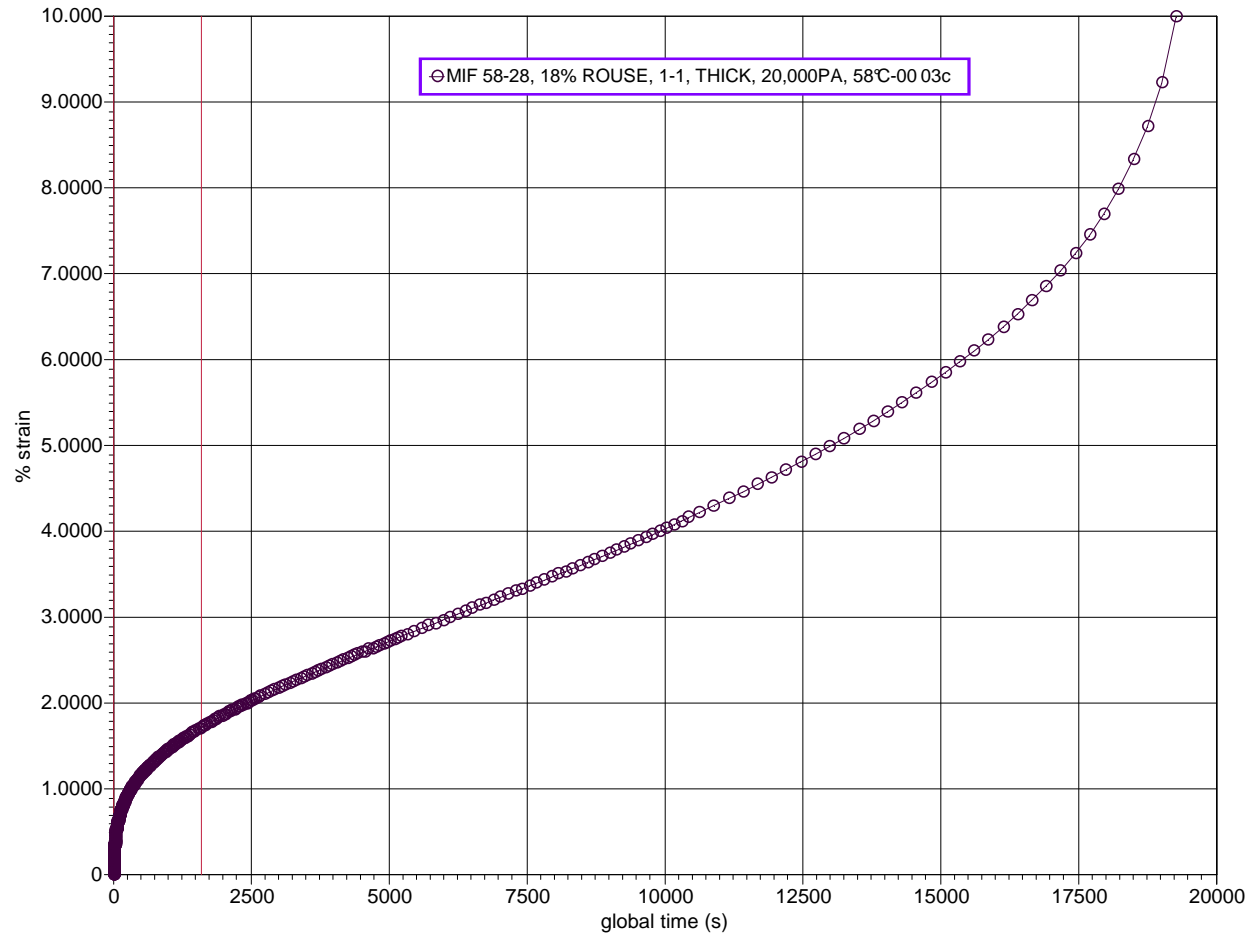
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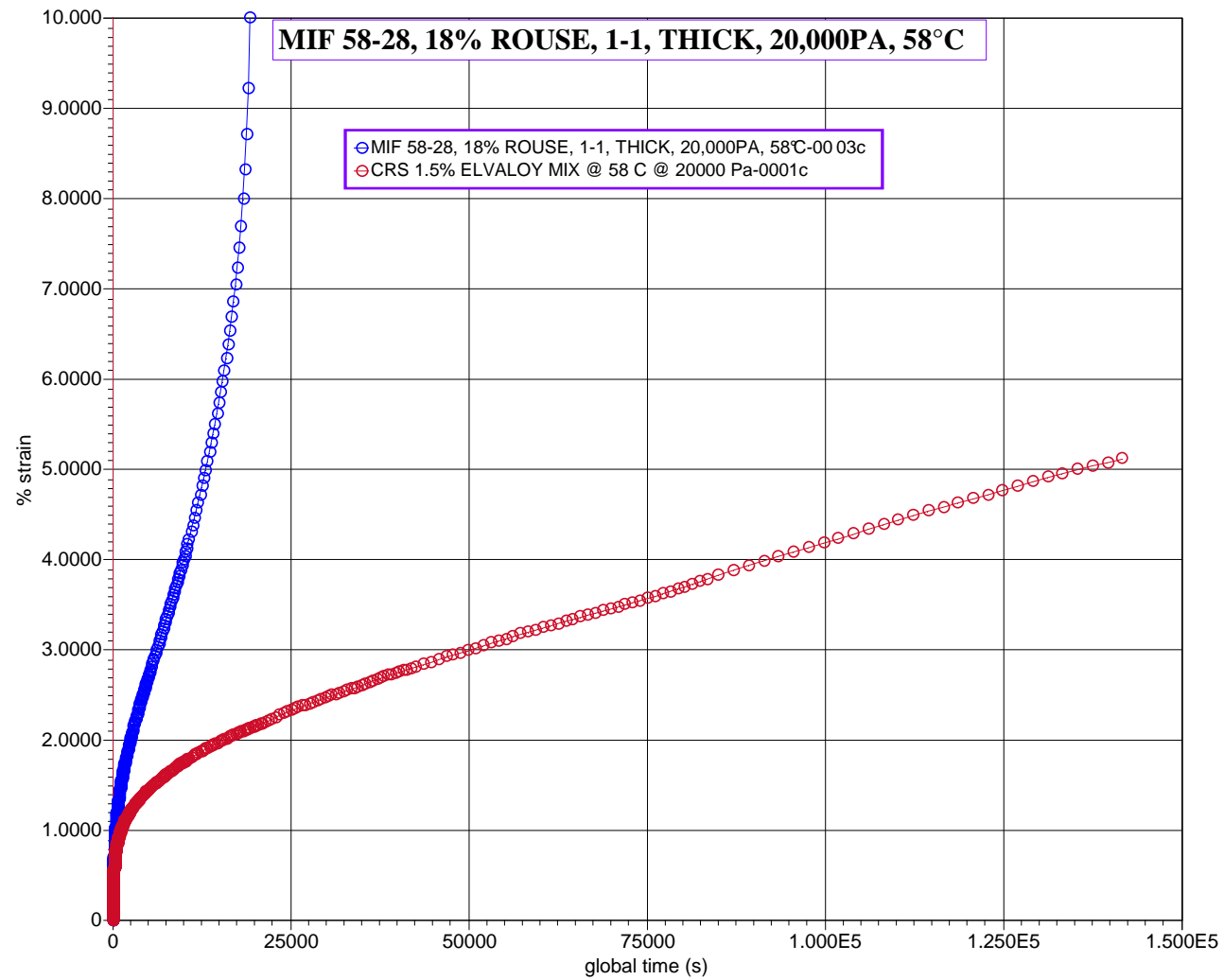
Elvaloy® RET
reactive elastomeric terpolymer

MIF 58-28, 18% ROUSE, 1-1, THICK, 20,000PA, 58°C



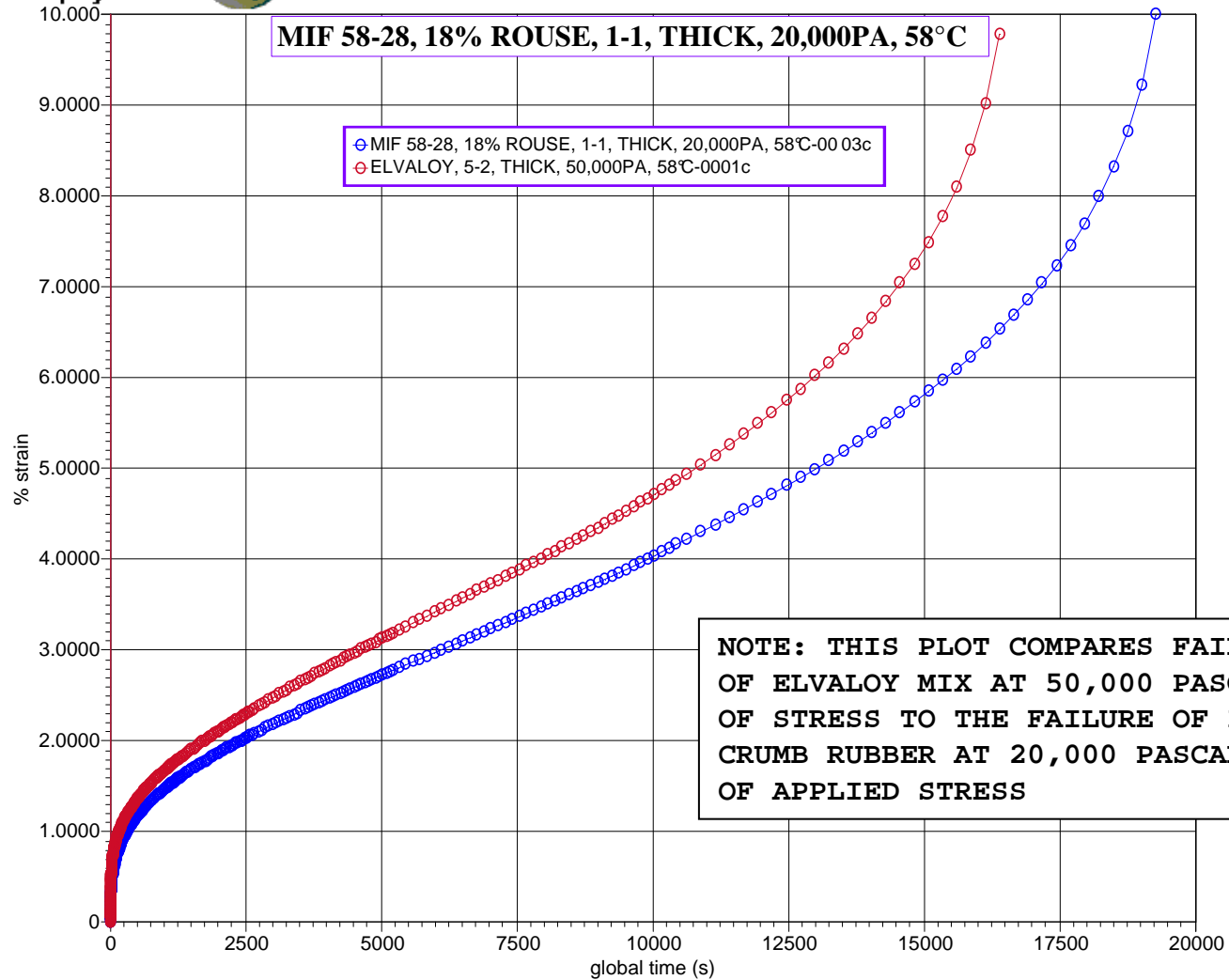


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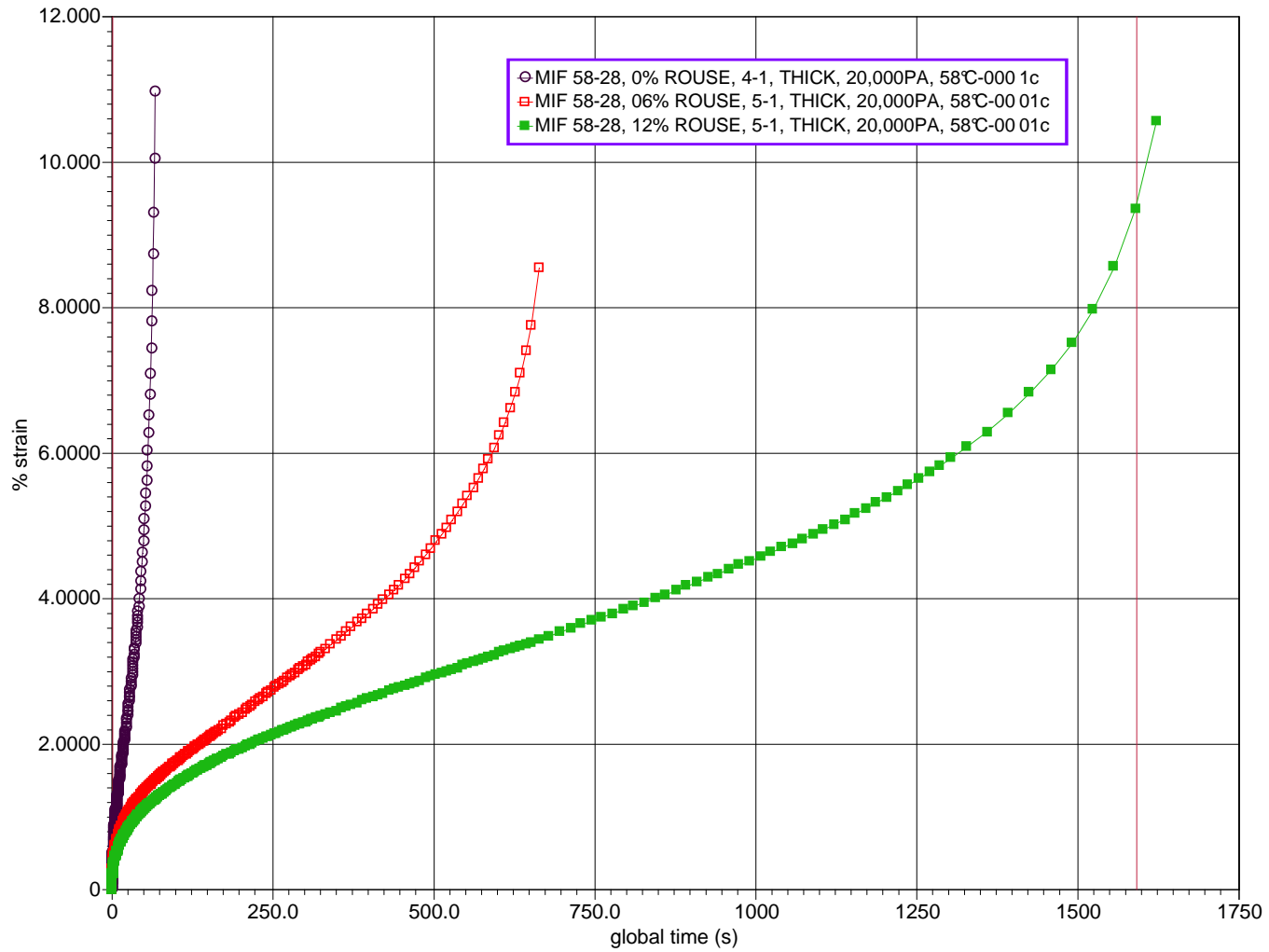
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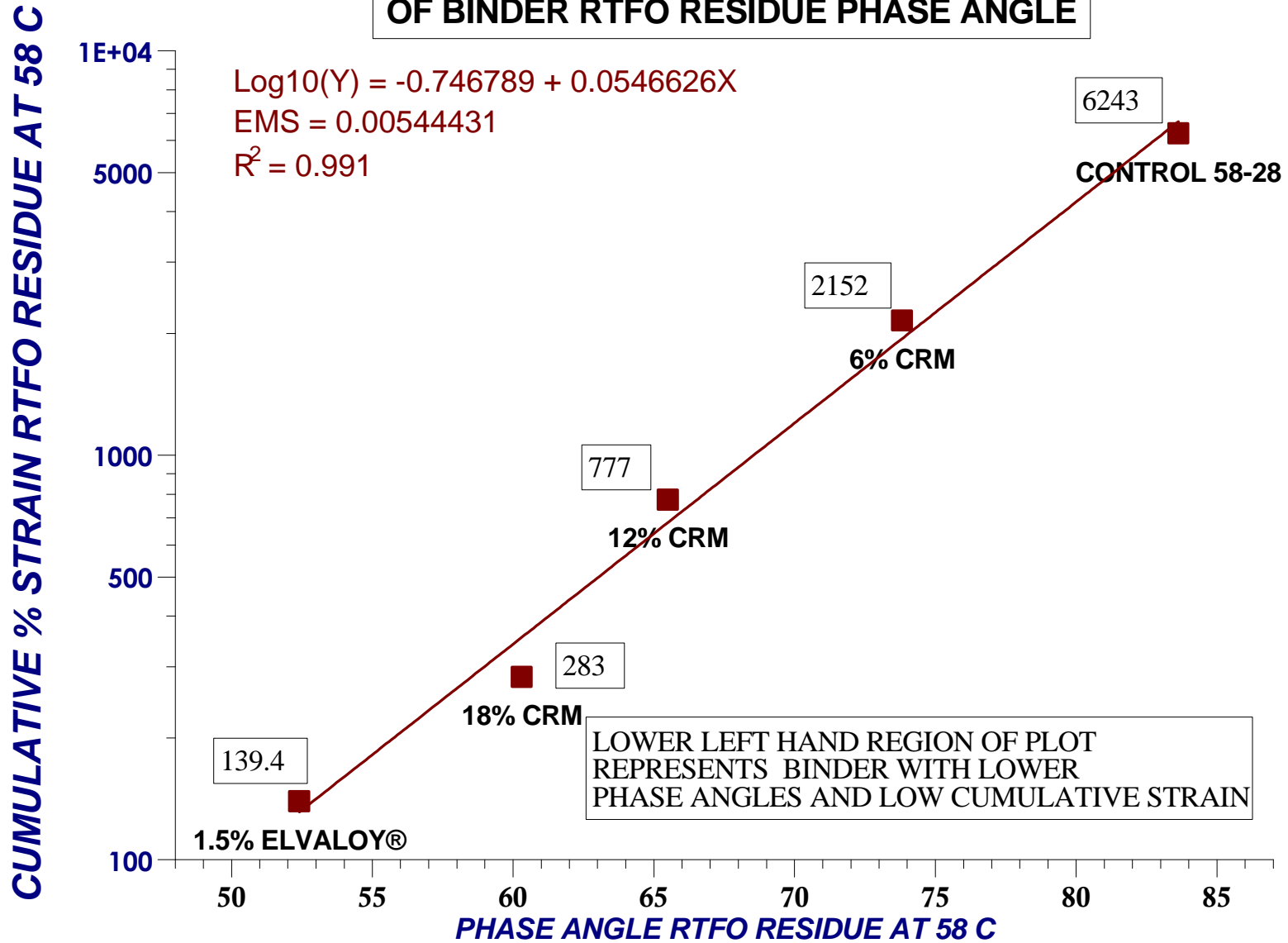


Elvaloy® RET
reactive elastomeric terpolymer

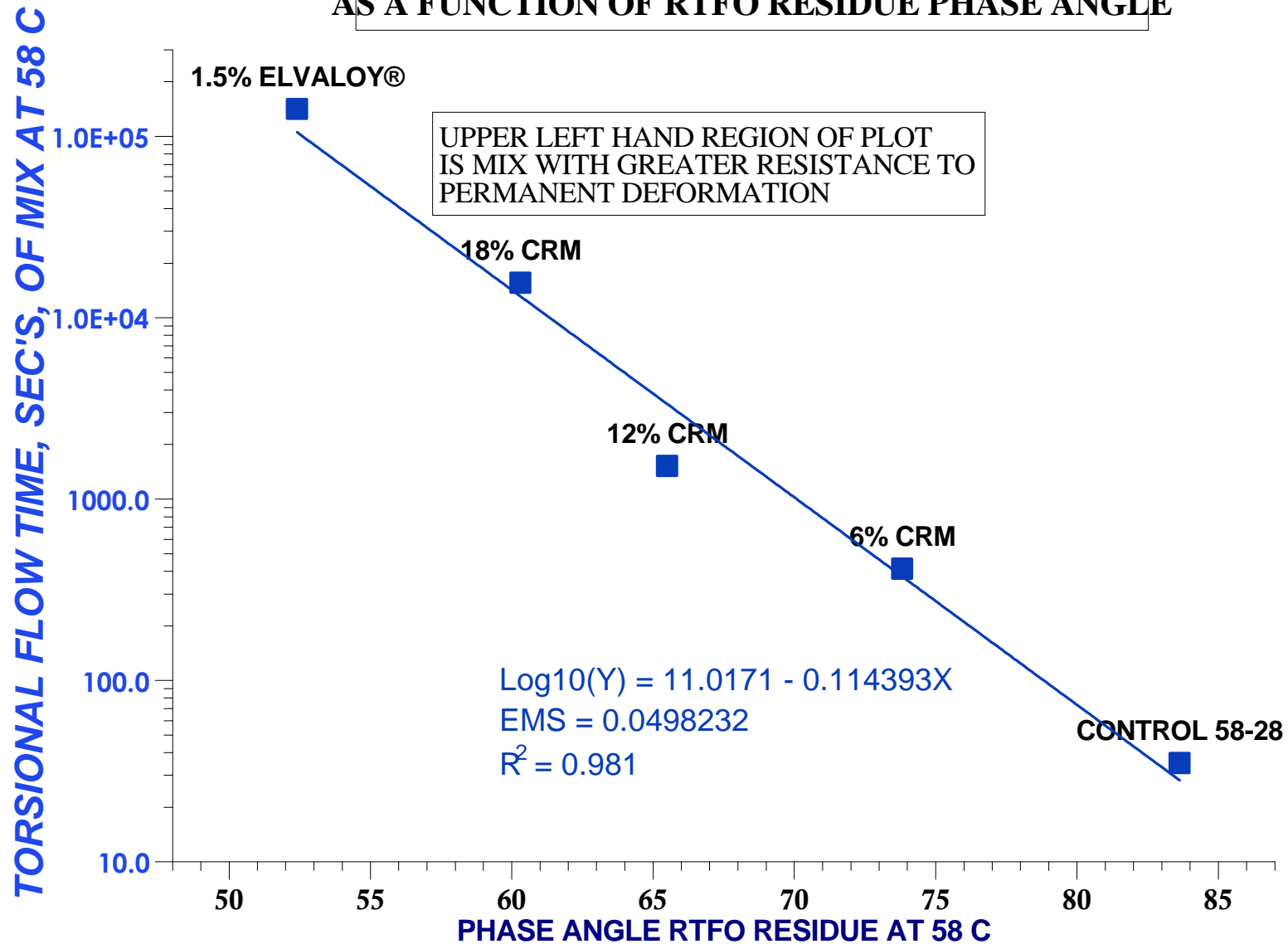
MIF 58-28, 0% ROUSE, 4-1, THICK, 20,000PA, 58°C



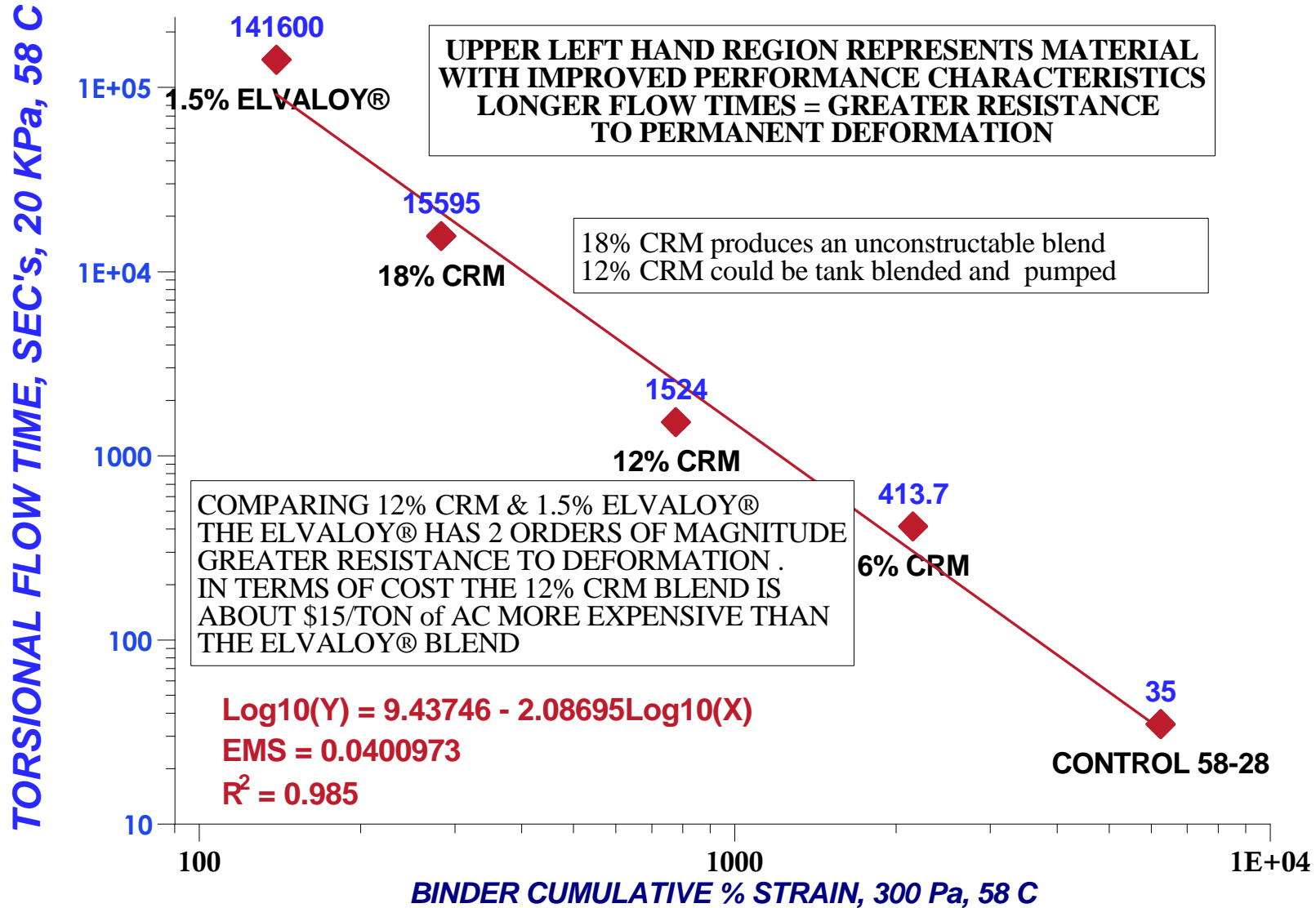
BINDER % CUMULATIVE STRAIN AS A FUNCTION OF BINDER RTFO RESIDUE PHASE ANGLE



CRUMB RUBBER STUDY: TORSIONAL FLOW TIME AS A FUNCTION OF RTFO RESIDUE PHASE ANGLE



TORSIONAL FLOW TIME OF MIX @ 58 C AS A FUNCTION OF BINDER % CUMULATIVE STRAIN





Elvaloy® RET
reactive elastomeric terpolymer

Elvaloy® RET & Crumb Rubber Formulation Cost Estimates for PG76-22 for Florida

- Crumb Rubber Formula Example
 - 12% GTR @ \$0.17/lb =
\$40.80/Ton*
 - *Note - Rouse Rubber quoted \$0.36/lb for 80 mesh GTR - April 2001. Price of \$0.17/lb was "Heard on the Street" for more course grades*
 - 1% SBS @ \$0.72/lb =
\$14.40/Ton
 - 0.25% Stabilizer @ \$0.50/lb =
\$2.50
- Total Estimated Cost Per Ton =
\$57.70

- DuPont Elvaloy® RET Example
 - 1.2% Elvaloy 4170 @ \$1.75/lb
= \$42.00/Ton
 - 0.4% Catalyst @ \$0.65/lb =
\$5.20/Ton
- Total Estimated Cost Per Ton =
\$47.20

Better Performance & Formulation Costs With
Elvaloy® RET Polymer Modifier



Elvaloy® RET
reactive elastomeric terpolymer

Florida Specification Path Forward?

- Should Florida Have Access To Other Performing Polymer Modifiers That Demonstrate Better Performance Than GTR?
- New Research & Testing Is Showing New Innovative Technology That Can Provide Longer Lasting Roads
- Increased Competition Drives Lower Costs And Greater Technology
- Let SHRP Performance Tests Be The Judge of PMA's