



The miracles of science™

Heavy Duty Engine Oil Classification Panel

Vamac® Ethylene/Acrylic (AEM) Elastomers in the Transportation Industry

Rob French
DuPont Automotive
October 8, 2003

Vamac[®] Elastomer Performance

Wide service temperature range at reasonable cost

⇒ -40 °C to 175 °C

Good resistance to engine oils, fluids, ozone and UV

High vibration damping

Excellent compression set and **CSR**

Vamac® Ethylene / Acrylic “AEM”

ASTM D2000 Line Call Out

Heat Resistance

Vamac® is rated as Type “ E ” ➔ 175°C

Continuous use up to 165°C

Fluid Resistance

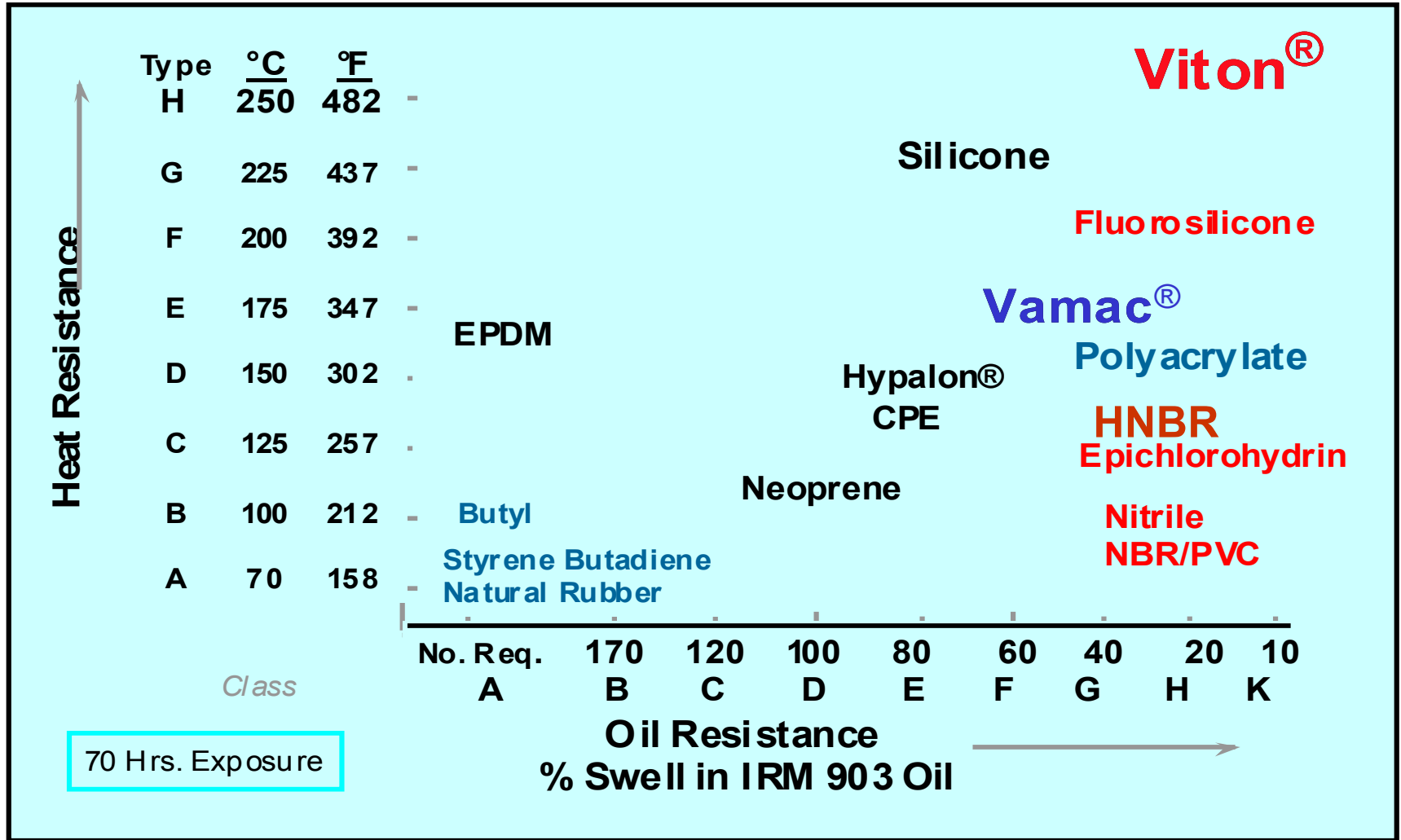
Vamac® is rated as

Class “ F ” for G & D Grades (60% Max)

Class “ G ” for GLS Grade (40% Max)

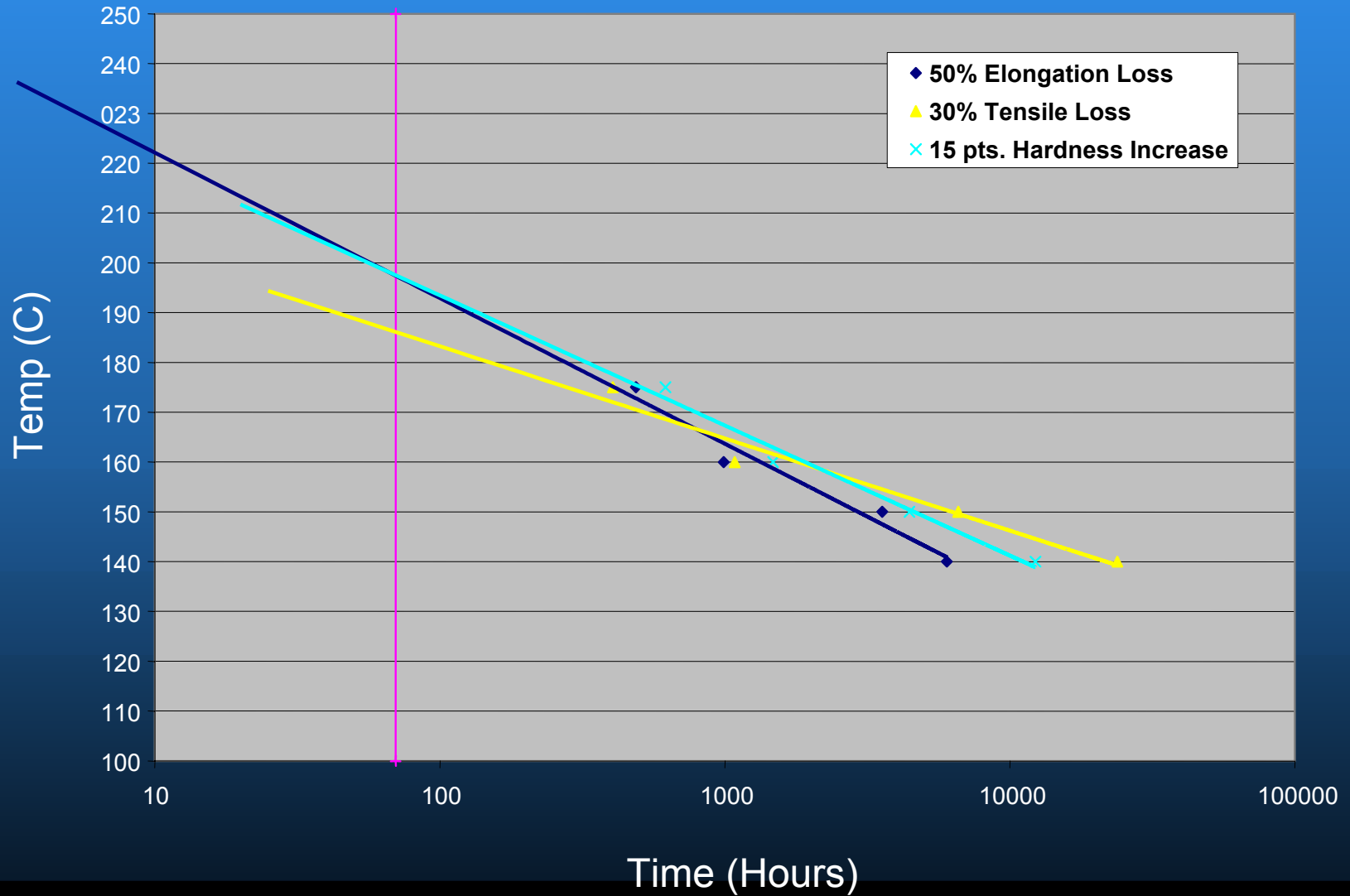
Heat & Oil Resistance of Elastomers

ASTM D2000 / SAE J200

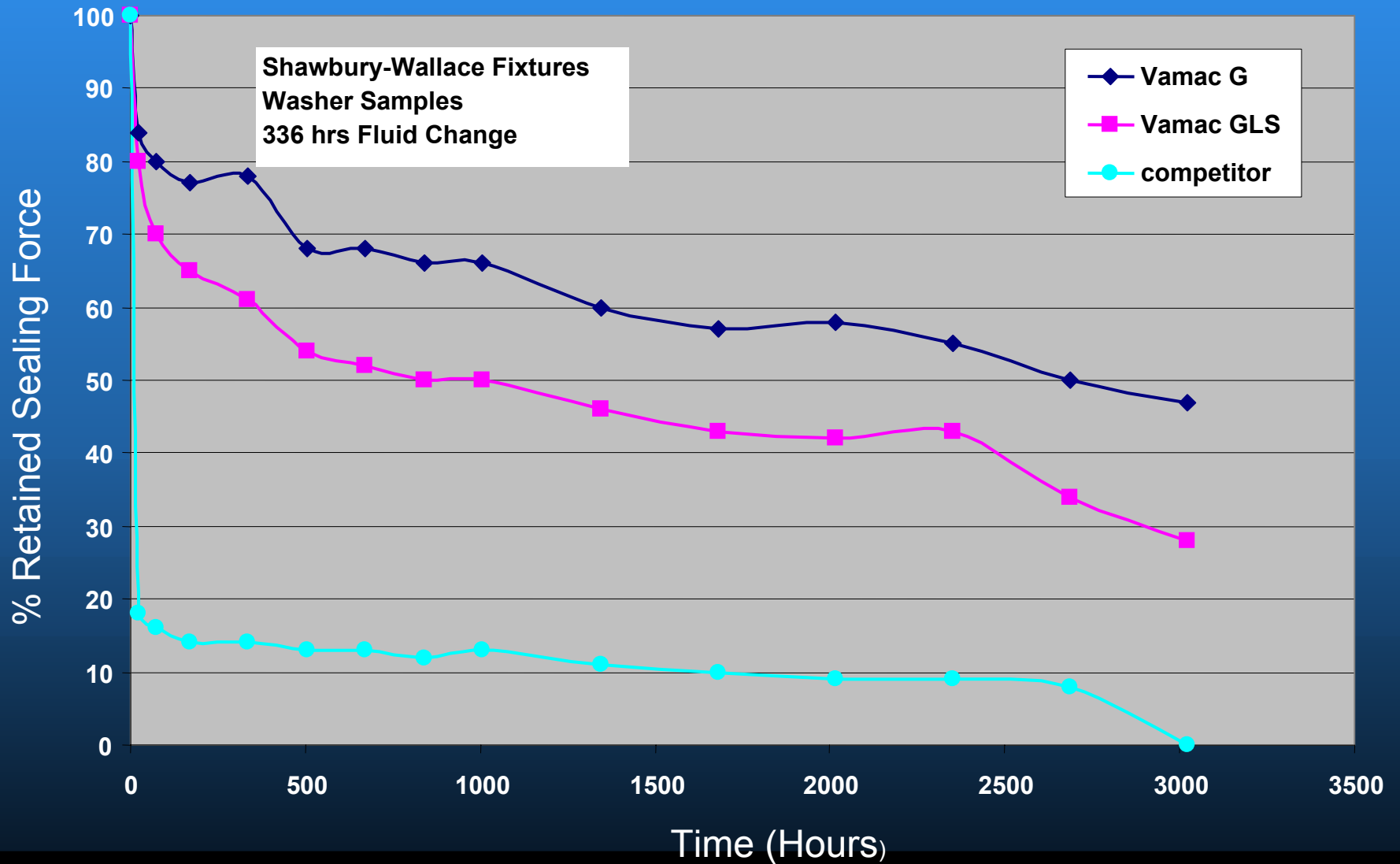


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Vamac® G - ASTM Heat Rating

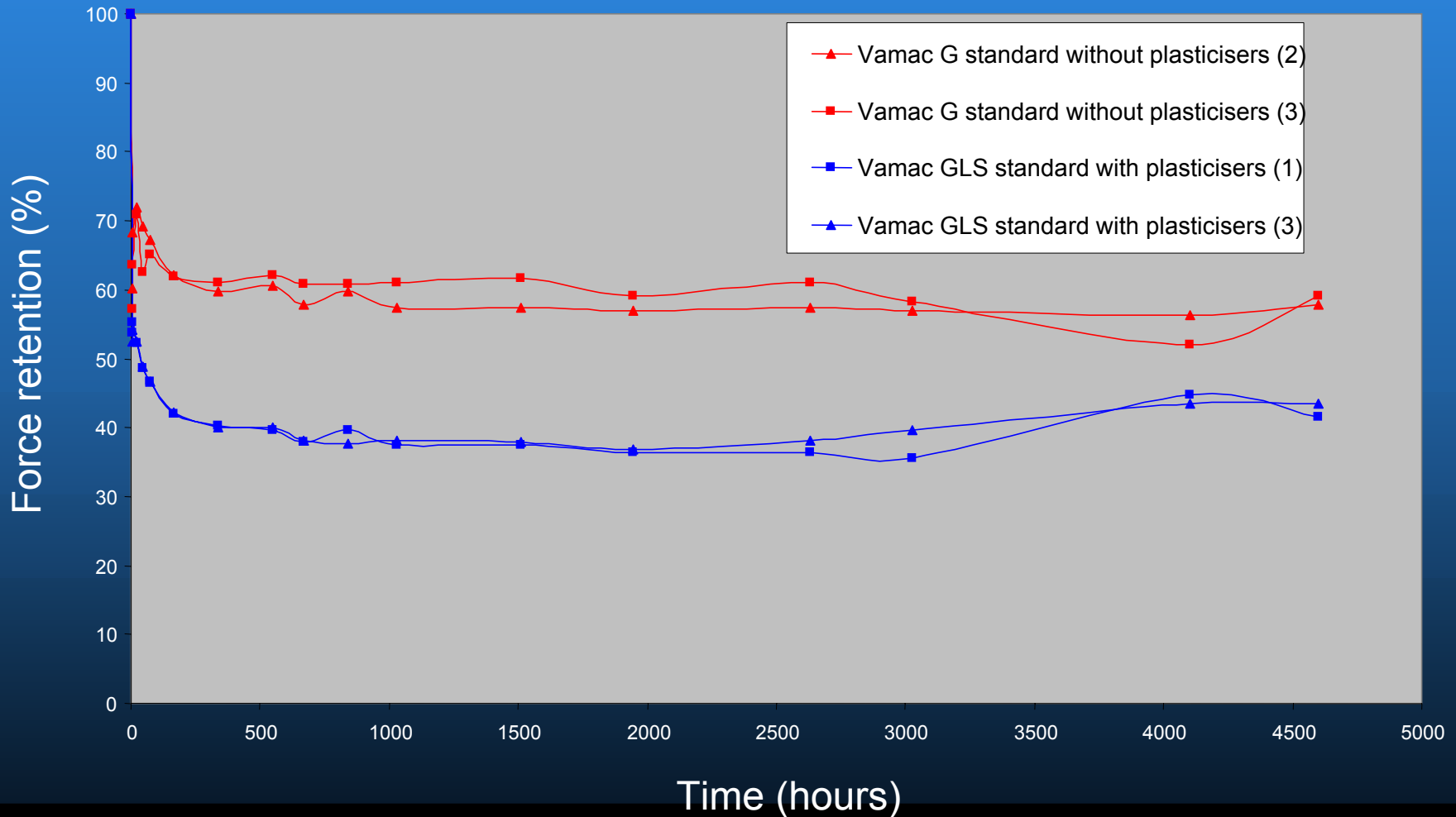


Vamac® CSR in SF105 @ 150 °C

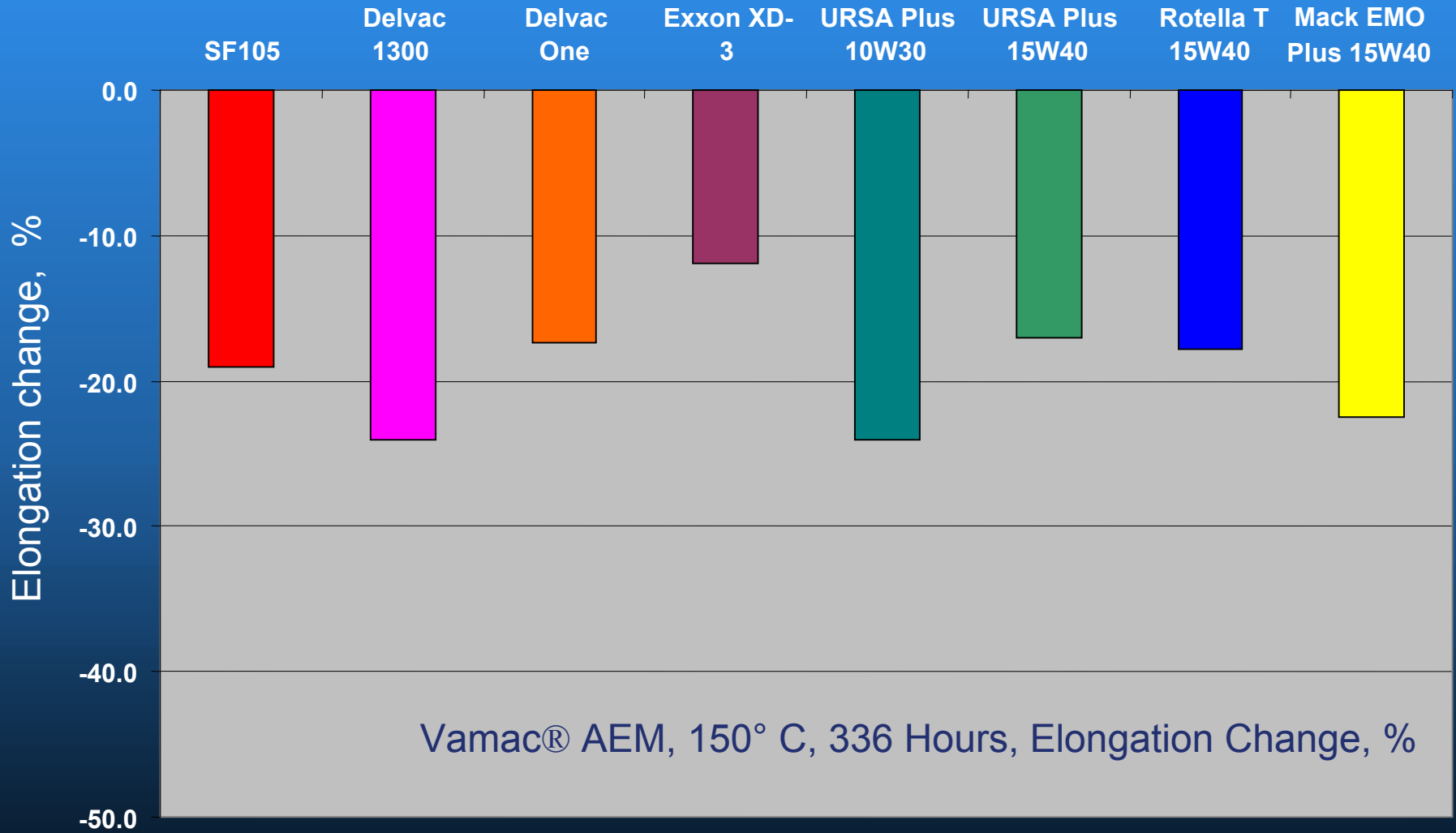


Vamac® CSR Data - Cecilia 20 @ 150 °C

Compressive stress relaxation in Cecilia 20 Oil and Shawbury-Wallace Fixture

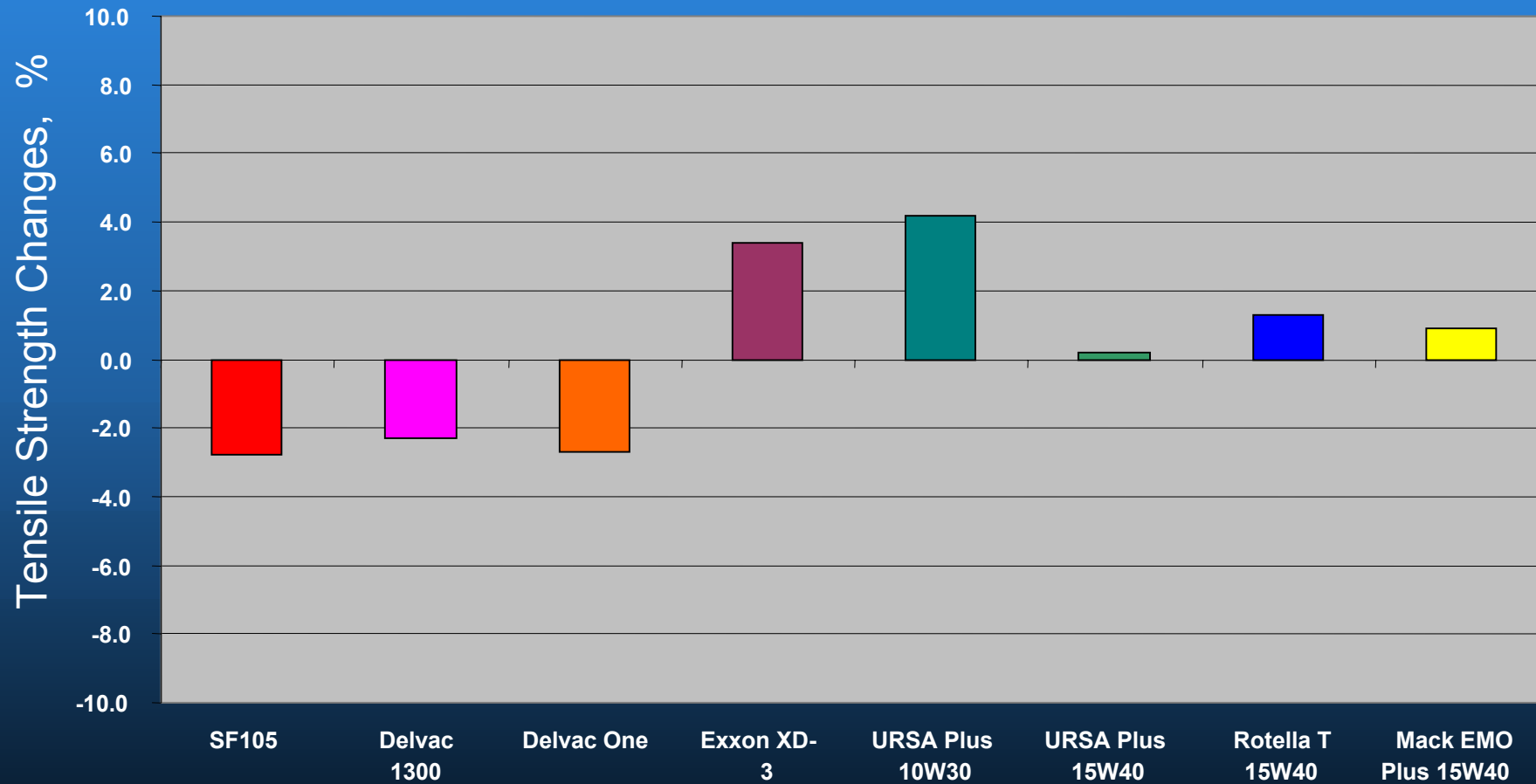


Aging of Vamac® in Diesel Fluids

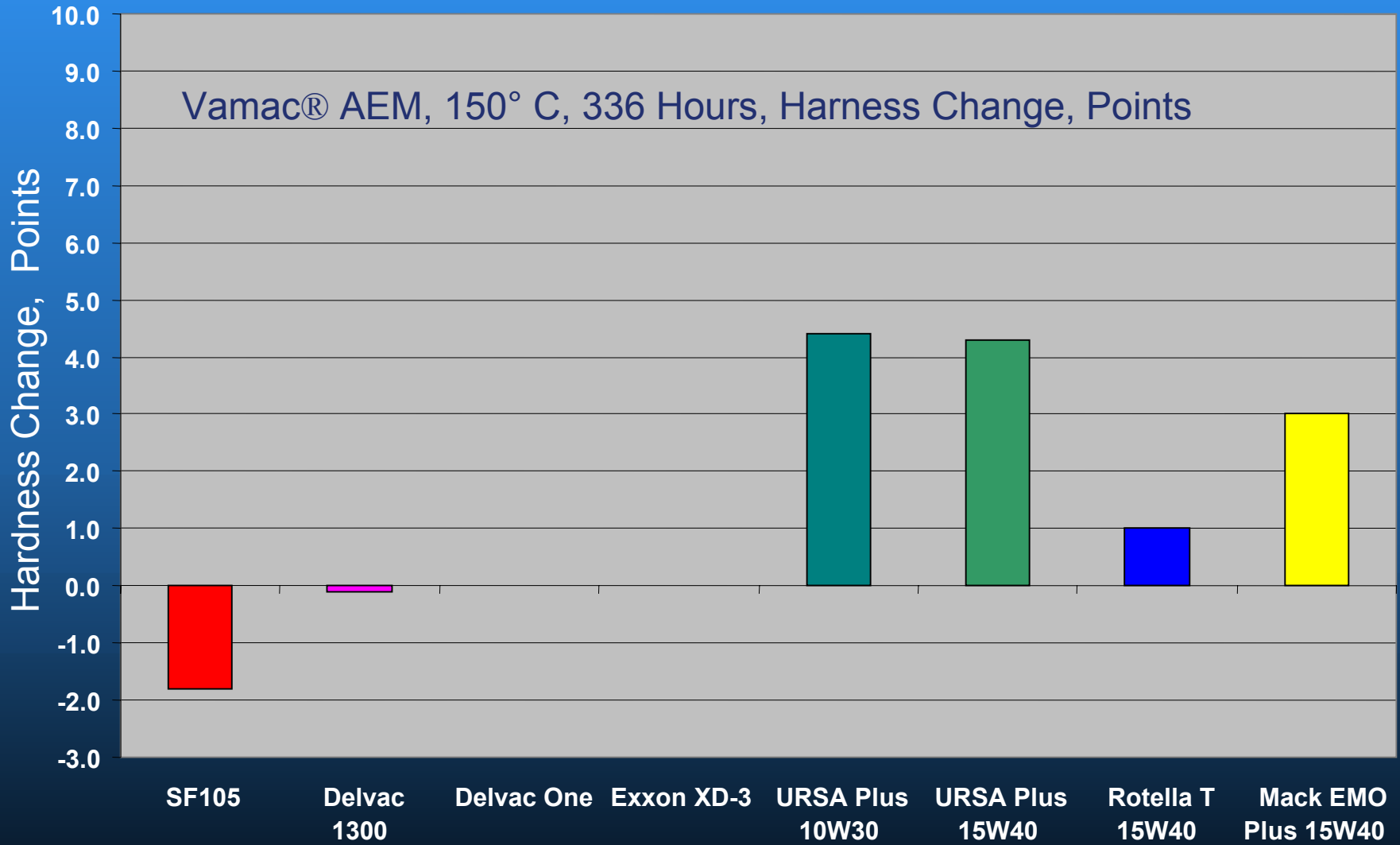


Aging of Vamac[®] in Diesel Fluids

Vamac[®] : 150° C, 336 Hours, Tensile Strength Changes, %



Aging of Vamac® in Diesel Fluids



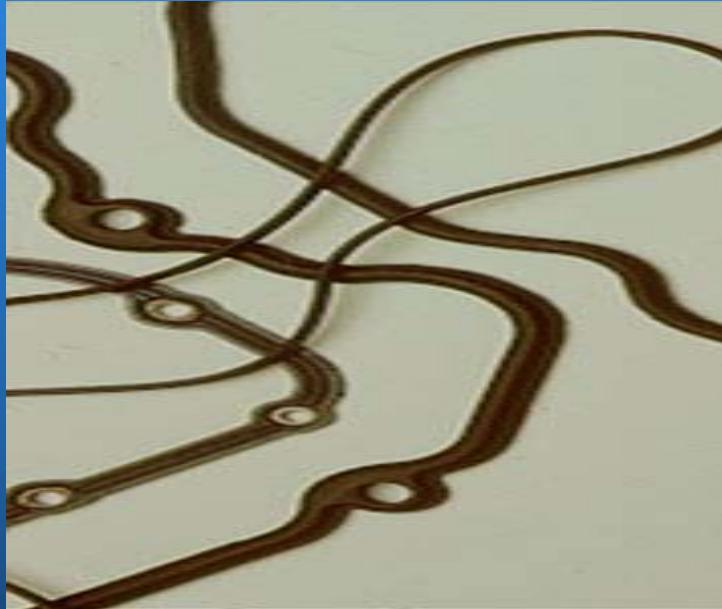
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Current **Vamac®** Applications Relevant to Heavy Duty Diesel

Gaskets and Seals



*Engine and transmission
pan and cover gaskets in
Vamac[®]*

Heavy Duty Diesel

Toyota

Isuzu

Volvo

Volkswagen

BMW

Renault

Ford

Daimler/Chrysler

GM

Turbo Diesel Hoses



Volkswagen

Daimler Benz

GM - Opel

Renault

PSA

Fiat

Volvo

Nissan

Oil Cooler Hose



Volkswagen

BMW

Volvo

Ford

Daimler/Chrysler

Mitsubishi

Honda

Toyota

Crankcase Ventilation Hose



Increasing use because of high temperature and oil resistance

Replacing ECO because of good resistance to acid condensate and combustion by-products

Dampers



Heavy Duty Diesel

Volkswagen

Daimler/Chrysler

PSA

BMW

Toyota

Honda

Nissan

Mitsubishi

Ford

Summary

Vamac[®] provides a good balance of heat and fluid resistance at reasonable cost.

Vamac[®] has excellent long-term heat resistance, dynamic flexibility, and resistance to exposure in mineral and synthetic engine oils, transmission fluids, and Diesel fuels.

As under-the-hood temperature rises and longer service is desired, **Vamac[®]** can be a very reliable and cost effective choice for hoses, gaskets, and seals.



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Thank You

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