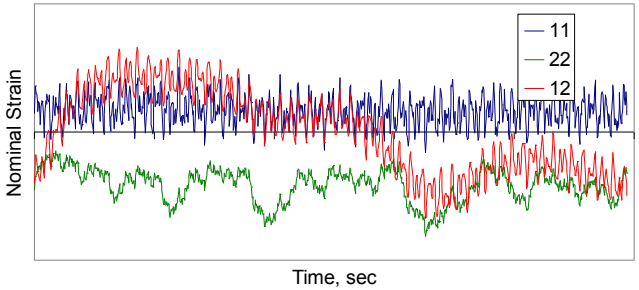
Achieving a durable elastomeric component doesn't have to be a black art…

Do you want to

- Solve durability issues with more confidence and less iteration?
- Characterize materials and components for life assessment or optimization?
- Estimate the impact of complex operating conditions?
- Accelerate design validation?



Factors that Distinguish Elastomers

Finite Strains - Nonlinear Elasticity - Self-Heating - Strain Crystallization - Time Dependence - Temperature Dependence - Ozone Attack - Mullins Effect - Ageing

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About the Instructor
Dr. Will Mars

- 18 years developing testing and simulation methods in the rubber industry
- Editor, Rubber Chemistry and Technology, Past Editor, Tire Science and Technology
- Past Adjunct at University of Toledo, taught graduate level Fracture Mechanics and Continuum Mechanics
- Sparks-Thomas award of ACS Rubber Division
- Henry Fuchs award of SAE Fatigue Design & Evaluation committee

What Attendees Are Saying

- "Great hands-on, very applicable to my FEA work."
- "Gave me awareness of issues we need to consider."
- "Knowledgeable instructor, helpful class discussion."

GM	Veyance
Harley Davidson	Caterpillar
Boston Scientific	Paulstra
Dana	Medtronic

To Register, use the form located here:
www.axelproducts.com/downloads/durability_registration.pdf

www.endurica.com

Phone: 419-957-0543
E-mail: wvmars@endurica.com

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Engineering of Durable Elastomeric Structures

Duration: 2 days

When: see www.endurica.com for next class dates

Where: Axel Products, Inc., Ann Arbor, MI

Fee: $2000

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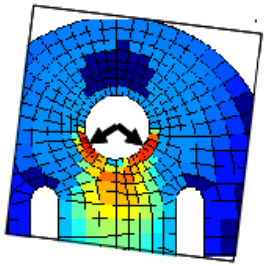

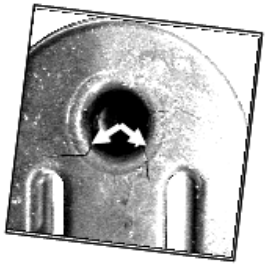

Engineering of Durable Elastomeric Structures

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Course Description

Elastomers are outstanding in their ability to repeatedly endure large deformations, and they are often applied where fatigue performance is a critical consideration. Because the macromolecular structure of elastomers gives rise to a number of unique behaviors, appropriately specialized methods are needed to characterize, analyze, and design for durability. This 2-day course provides the know-how for engineering durable elastomeric components and systems. The course is taught at Axel Products, and includes live demos of typical behavior.

Who Should Attend?

This training is intended for engineers involved with the design, analysis, and testing of elastomer materials, components, and systems that must endure dynamic loading conditions.

Materials, Product, and System Engineers, Finite Element and Durability Analysts, Test Development Engineers.

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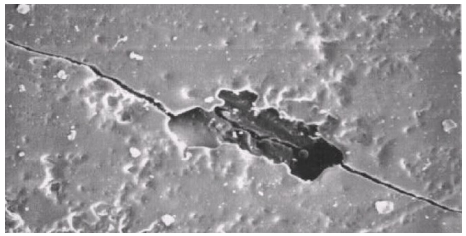
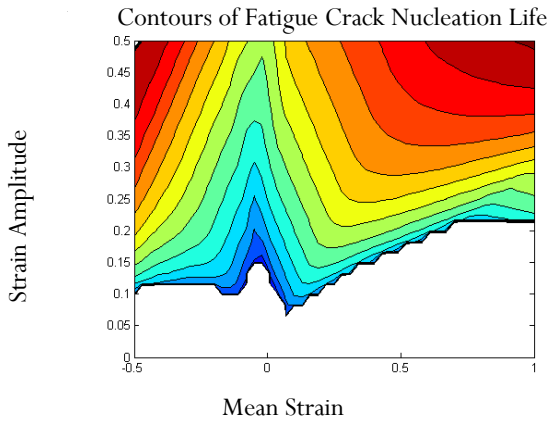
Course Topics

- Elastomers as engineered materials
- Stress-strain behavior: physics, phenomenology, characterization, and modeling
- Self-heating in elastomers
- Physics of elastomer fatigue
- Phenomenology of durability: strength, fatigue threshold, R-ratio effects, the Haigh diagram
- Crack Nucleation and Fracture Mechanics analysis approaches
- Factors that affect fatigue behavior
- Material characterization for fatigue life assessment
- Dealing with multiaxial loading
- Dealing with variable amplitude loading and damage accumulation
- Finite Element modeling for fatigue life prediction



Course Objectives

- Know what distinguishes rubber's fatigue behavior from other engineering materials
- Know when and how to apply crack nucleation and fracture mechanics paradigms to solve durability issues
- Know how to efficiently characterize rubber's stress-strain and fatigue behavior for assessing impact on component durability
- Understand your options for dealing with: material and geometrical design choices, complex mechanical and thermal duty cycles, environmental conditions (ozone, ageing), time-dependent effects