

2113 words | 8 minute read
 All materials are temperature dependent, but some more than others: metals tend to be crystalline solids and will melt at sufficiently high temperatures. In contrast, crosslinked elastomers are always solids. They can be glassy or rubbery, crystalline or amorphous. When heated to extreme temperatures, they burn rather than melt, producing new substances, usually low molecular weight hydrocarbons (i.e. tarry substances and smoke). Of course, you do not have to melt or burn a material to see the effects of temperature. In fatigue analysis, we are concerned with stress-strain and crack growth behaviour. These can be temperature dependent for both metals and rubbers. However, while metals have a very high thermal conductivity, rubbers have almost the lowest. Therefore, fatigue analyses involving large temperature gradients are much... [READ MORE](#)



1084 words | 4:09 read
 Wow – this year has really been one of many firsts for Endurica. We had our first ever Community Conference in April, we started our first sister company – in Europe, and from September 9 – 13, 2024, we presented 4 technical papers – a new Endurica record for one week! The other impressive aspect of this latter feat was that the four presentations were on vastly different topics! I'll just list the venues and titles and then discuss each one:

International Elastomer Conference 2024, Pittsburgh, PA, USA:
 1. "Heat Build-Up and Thermal Runaway in a Rotating Bending Experiment"

44th Annual Meeting and Conference of The Tire Society, Akron OH, USA:
 1. "Coupled Multiphysics Strategy to Monitor the Health of Rubbery Structures Using Endurica Tools"
 2. "Critical Plane Analysis of Surface-proximal Fields for the Simulation of Mechanochemical Wear"
 3. "Models, Materials and the Move" Towards Virtual Product Development [READ MORE](#)



SHORTLISTED FOR R&D BREAKTHROUGH OF THE YEAR!



Coupled Structural Thermal/Diffusion Simulation for Tire Oxidation & Fatigue



We've been shortlisted for R&D Breakthrough of the Year in the **Tire Technology International Awards for Innovation and Excellence 2025**.

We believe our R&D breakthrough – coupled structural thermal/diffusion simulation for tire oxidation and fatigue – is a game-changer for tire durability testing. It delivers unprecedented simulation accuracy, reducing the need for costly, time-consuming, and destructive prototype testing.

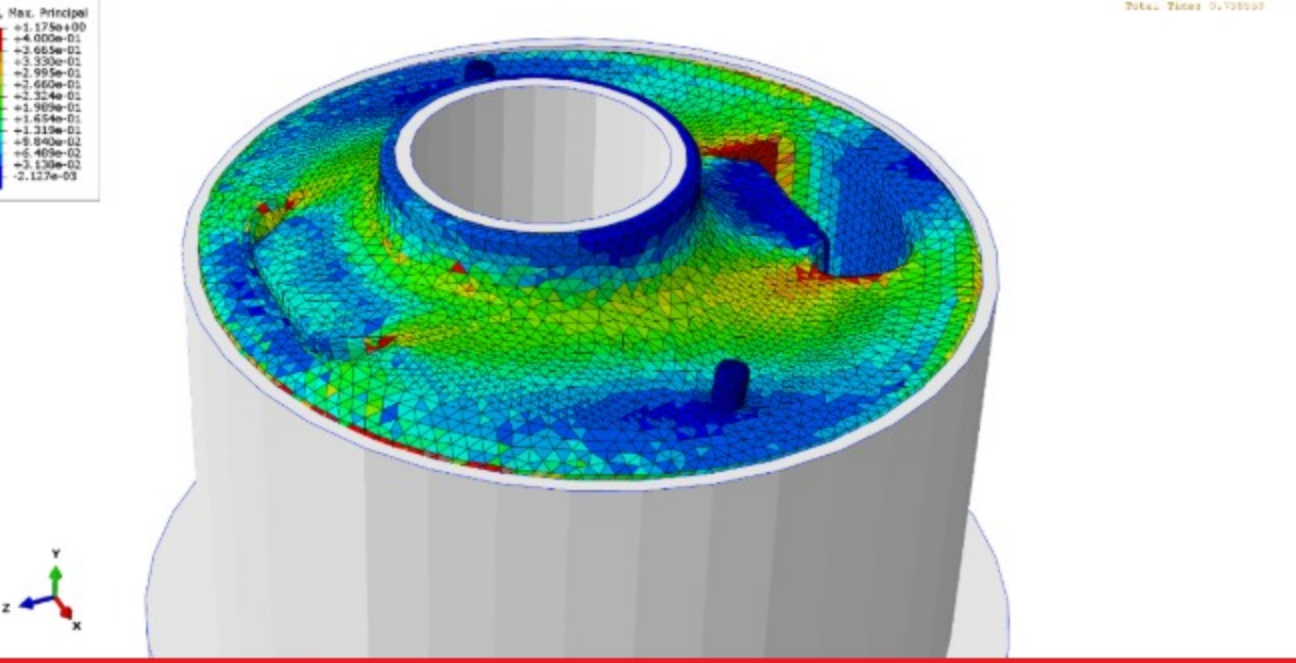
This innovation originated from a collaboration with **Akron Rubber Development Laboratory, Inc.** and takes into account the combined impacts of mechanical, thermal, and oxidative history, using purpose-developed diffusion and oxidation experiments to obtain the material parameters required for the simulation. The simulation captures not only the mechanical, thermal and oxidative fields but it also tracks the consequent evolution of stiffness and crack growth properties, and their coupled dependencies on stress/strain, temperature and dissolved oxygen concentration.

If you want to know more, **Dr. Mahmoud Assaad**, our Senior Technical Advisor, will present the fully coupled simulation at the conference during **Tire Technology Expo 2025** in Hannover, Germany, on Thursday, March 6, at 9:25 AM.

And if you're attending the exhibition, visit the **Endurica** team at Booth C218 from March 4-6.

Congratulations to all the award nominees! We look forward to the announcement of the winners at **Tire Technology Expo 2025**.

[READ THE TIRE TECH ANNOUNCEMENT](#)



Devil in the Details: How to achieve accurate fatigue calculations with Coreform Cubit and Endurica CL

Small features on molded rubber parts, such as small radius fillets, mold injection ports, and tire vents, can significantly affect fatigue performance due to their stress-concentrating effects. However, these critical details are often overlooked because of the challenges they pose in meshing.

Accurate fatigue life prediction hinges on precise stress and strain calculations, which are directly tied to mesh quality. Join us for an in-depth discussion on:

- Small features and mesh quality impact on fatigue life.
- Core principles for effective mesh development.
- Tools to simplify and optimize your meshing process.

In this webinar, **Dr. Will Mars**, founder and President of Endurica, is joined by **Greg Vernon**, Director of Product at Coreform, and **Mark Bauman**, Engineering Analyst at Endurica. The team will demonstrate how Coreform Cubit tackles these challenges within Endurica CL. Using an automotive bushing as an example, the team will showcase real-world applications in the rubber industry and provide actionable insights for achieving accurate fatigue predictions with minimal effort.

Don't miss this opportunity to learn how to master the details that make all the difference in accurate fatigue analysis.

[Learn More and Register](#)

2025 Resolution: Get Durability Right

There's never been a more important time to Get Durability Right.

1. Building sustainable solutions is a competitive necessity. **How do you incorporate the newest materials and additives without knowing how long they will last?** Endurica's powerful fatigue simulation workflows are the answer to developing Eco-friendly products that meet your customers durability requirements.
2. Expectations and requirements are higher than ever. From the automotive industry to medical devices – **there is no room for error or missed deadlines. Get to market faster, with an unprecedented degree of certainty** by using Endurica's workflows.
3. In-office or Remote. **Mergers vs. Acquisitions. AI or Business As Usual.** The challenges are unprecedented and growing. **Go with a proven winner. Endurica is the world's best validated fatigue life simulation system for elastomers** and our workflows get rubber products to market faster.

The best way to see Endurica in action is on your own operation and this is a great time to get started with a trial license. There is no cost involved and no commitment required. It is time to act on your 2025 Resolution to Get Durability Right.

[Send a quick email to get started](#)



Get Your Materials Testing Projects Underway Now

FATIGUE PROPERTY MAPPING [KNOW YOUR MATERIAL](#)

Reduce risk and the cost of multiple development iterations when you take your material's fatigue capabilities into account. Check out the options with our **Fatigue Property Mapping** system or contact us now to get your projects underway. Email tgebott@endurica.com

Get to Know the Folks at Endurica Europe SARL

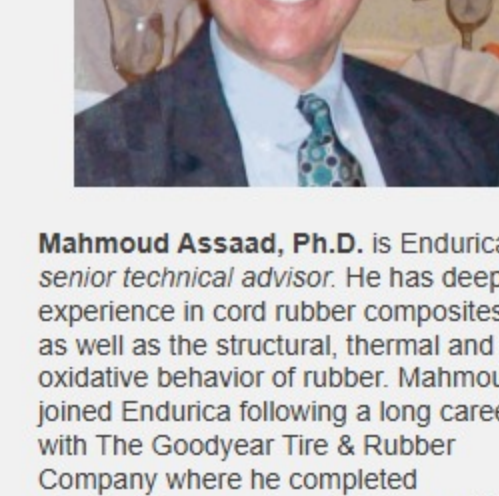


Jean-Pierre Jeusette is the executive director of Endurica Europe and is responsible for business governance and go-to-market strategy. Jean-Pierre resides in Luxembourg and formerly held positions with Goodyear as the vice president of global quality and as the general director of Goodyear's Innovation Center in Luxembourg. He was key to the development of technology for computational tire mechanics and its use in the product development process.



Wes McMinimy is Endurica Europe's business development manager with responsibility for business growth and day-to-day operations. Wes has a degree in Civil Engineering from Northwestern University, and he resides in Luxembourg. Before joining Endurica, Wes worked at Amazon in Luxembourg for 10 years with contributions in operations management, B2B product innovation, and as a Product Development Manager.

Endurica is Growing at our Headquarters, too!



Mahmoud Assaad, Ph.D., is Endurica's senior technical advisor. He has deep experience in cord rubber composites as well as the structural, thermal and oxidative behavior of rubber. Mahmoud joined Endurica following a long career with The Goodyear Tire & Rubber Company where he completed significant research work in the multi-physics simulation of tire performance. Mahmoud earned his Ph.D. and Masters degrees from Iowa State University and holds a Masters degree in Polymer Science from the University of Akron. He has also served as an Adjunct Assistant Professor in the Civil Engineering Department at the University of Akron and was a lecturer at The University of Toledo. Mahmoud received NASA's Special Achievement Award and won the machinery / equipment category in their 2008 Create the Future Design Contest.



Zach Ebbott is a finance intern who has taken on a number of projects including financial forecasting for both sales and cash flow. He is helping to develop offerings for software and instrument maintenance plans as well. Zach is a graduate of Regis University with a Bachelor of Science in Finance. While at Regis, Zach co-authored a paper entitled "Silicon Valley Bank: A Tale of Hubris, Risk, Forbearance, and Failure" – research on regulatory oversights that lead to the 2023 collapse of Silicon Valley Bank. This work is slated for publishing and use in undergraduate courses (earlier in his career than his father was when he first published a scientific work). He also served as CFO of the Regis Student Government and managed a budget of \$380,000 for their fiscal year. An avid volleyball player, Zach's team just took the silver in their bracket of 18 teams at the VolleyPaws tournament near Cleveland.

Do Not Miss Spring Training!



March 17-21, 2025

Plan and execute effective fatigue testing programs to take your rubber fatigue simulations further.

[Click for Workshop Details](#)



March 25-28, 2025

Make the most of Endurica's simulation workflows and learn to use Endurica CL, Endurica DT, and Endurica EIE.

[Click for More Details](#)

Demand for these workshops is unprecedented and space is limited. Register TODAY!



Did you miss the live presentation? Watch it now by clicking the link below.

What REALLY happens to the rubber isolators supporting a battery when you take a one-hour drive through Milwaukee? Find out in this exciting and informative webinar on integrating durability solutions with a method for collecting load data. See how we combine process loads data and stress-strain histories information with rubber fatigue knowledge into comprehensive fatigue life analysis wisdom.

[Watch the Webinar Now](#)



Rubbernecking is an interesting thing that makes us look twice -- this issue we check out what makes stretchy things stretch

The Infinite Monkey Cage

What makes stretchy things stretch? Find out as Brian Cox and Robin Ince expand their knowledge of elasticity with Olympian Bryony Page, comedian Jessica Fostekov & experts **Dr Anna Ploszajski** and **Prof James Burfield** from **Queen Mary University of London**. Enjoy this podcast and journey through different applications of elastic materials. Examine, at the molecular level, what happens when we stretch a material and crucially what causes it to return to its original shape. This is especially pertinent to our guest Olympian and British champion trampolinist **Bryony Page** who has capitalised on elasticity in her 24 year long career. Additionally, hear how scientists sometimes just can't beat nature, natural rubber and spiders silk are two such cases. **Anna Ploszajski** takes us through some of the more inventive techniques scientists have engineered to produce more of these natural materials, including genetically engineering goats to be milked for silk. [Listen Now](#)

