

## Rubber Fatigue ≠ Metal Fatigue Part 2: Linear Superposition

2,405 words | 9:07 minute read

The load cases to be considered in fatigue analysis can be very lengthy and can involve multiple load axes. Often, load cases are much longer than can be calculated via direct time-domain finite element analysis (FEA).

In metal fatigue analysis, linear superposition is a widely used technique to generate stress-strain history from road loads [1], [2], [3]. When structures behave linearly, this approach is accurate and computationally efficient, allowing the analysis of lengthy load signals. For single axis problems, the finite element (FE) solution for a single unit load case is simply scaled according to the input load history. For multiaxial problems, unit load cases are solved for each of the axes, then scaled and combined according to the input load history.

Due to rubber's 1) nonlinear material behaviour, 2) nonlinear kinematics, and 3) the possibility of nonlinear contact, linear superposition cannot be applied to... [READ MORE](#)

### Big News from Endurica!



505 words | 2:00 minute read

Endurica LLC, the developer and provider of the world's most comprehensive CAE workflows for fatigue analysis of elastomers, announces a strategic expansion in Europe with the incorporation of a new sister company, Endurica Europe SARL. Headquartered in Luxembourg, Endurica Europe SARL is chartered with two strategic objectives: Growth – to extend the market presence of Endurica's industry-leading software and services solutions, along with improved customer service in Europe; and Innovation – to expand Endurica's technical leadership in elastomer durability with new capabilities and support for a broader range of polymers to enable customers to [READ MORE](#)

## WINNING ON DURABILITY CUTTING EDGE METHODS FOR RUBBER WEAR & TEAR

**LIVE WEBINAR:** FRI, SEPTEMBER 20, 2024 at 9 am EST (UTC-4)  
RSVP: [ENDURICA.COM/WORKFLOW](https://endurica.com/workflow) Featuring Dr. Will Mars, Endurica, Founder & President


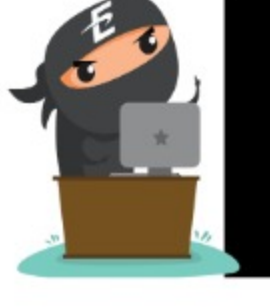


There's a new test in town that will make you think twice about the industry standard BF Goodrich Cut and Chip. Join us as we share:

- The physics governing wear and chip & cut phenomena in rubber
- How Endurica's workflows are different from other durability analysis workflows
- Typical testing machines and tests for friction, abrasion and cut & chip characterization
- Methods to combine wear and structural fatigue for an overall look at product durability.

[Learn More and Register](#)

### Learn Endurica's Software through Live, Online Training

 <p><b>Characterizing Elastomer Fatigue Behavior for Analysis and Engineering</b></p>	 <p><b>Application of Rubber Fatigue Analysis with Endurica Software</b></p>
<p>Join Dr. Tom Ebbott to learn the science behind Endurica's software.</p> <p>Register Now for October 14-18, 2024</p> <p>Live, online workshop.</p>	<p>Join Dr. Will Mars and learn how to run Endurica's software.</p> <p>The next live, online workshop is November 19-22, 2024</p>

### Want to Try Endurica's Software? Request a Trial License Now!

 <p><b>Endurica CL</b> Fatigue Analysis Software</p>	 <p><b>Endurica DT</b> Incremental Fatigue Analysis</p>	 <p><b>Endurica EIE</b> Fast Loads Processing</p>
<p>The best way to see Endurica in action is in your own operation and there is no better time to get started with a trial license. There is no cost involved and no commitment required.</p> <p><a href="#">Send a quick email to start the process</a></p>		

### Submit Testing Projects Now to Complete by Year End 2024 2025 Price Increase Just Around the Corner

Time is running out for materials characterization testing to be completed in 2024. Contact us NOW to get your projects completed this year. Email [tgebbott@endurica.com](mailto:tgebbott@endurica.com)

Now is the time to start your Endurica software license at current prices - a rate increase will go into effect 01-01-2025

### Endurica Conference Schedule

9-11 October - **IRC (International Rubber Conference) 2024** - Istanbul, Turkey  
5-7 December - **RubberCon 2024** - Kochi, India

To meet with our professionals at one of these events and/or at your firm located nearby, please email Endurica's Vice President, Tom Ebbott, Ph.D. at [tgebbott@endurica.com](mailto:tgebbott@endurica.com)

### First Annual Combined Winning on Durability / Fatigue Ninja Friday Event: Fatigue Ninja Frontier A Sneak Peek at What is Next!



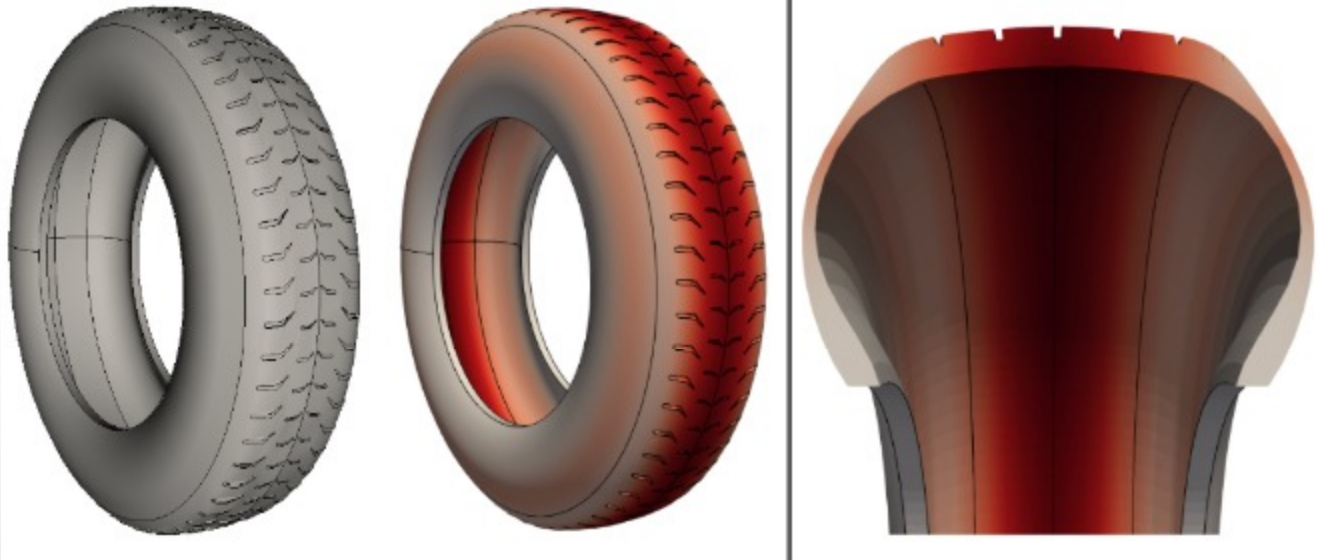
**FATIGUE NINJA FRONTIER**  
WHAT IS NEW + WHAT IS NEXT FROM ENDURICA

FRIDAY OCTOBER 18, 2024 9 AM DST | ONLINE




Save the date for our first-ever **Fatigue Ninja Frontier** -- a major event introducing the latest in software code updates + what's planned for release in 2025. This combined Winning on Durability (focused on the business side of durability) and Fatigue Ninja Friday (deep-dive training sessions for Endurica users) is a do not miss event for everyone in the rubber industry whose products need to meet durability requirements. Registration details to follow.

### Endurica Supporting Coreform with Department of Energy Initiative to Improve Tire Tread Simulation



Endurica's rubber durability simulation software is a key tool in the completion of Coreform's Phase 2 SBIR grant from the Department of Energy to develop computer simulation processes utilizing isogeometric analysis that will increase the use of simulation in the advanced tire industry. [READ MORE](#)

### Endurica's Third Annual Canoe Trip

