Endurica MP™

TEMPERATURE | DIFFUSION | OXIDATION

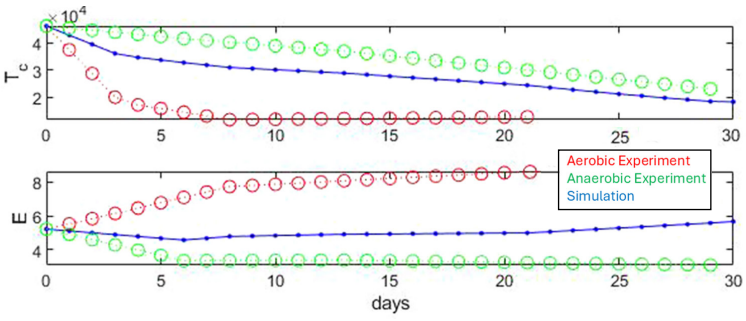
Give Endurica MP™ your finite element simulations and materials definitions, then MP orchestrates the appropriate workflows: tire rolling resistance, steady-state and transient thermal analyses, oxygen diffusion, and chemical reactions such as oxidation.

BENEFITS

- Predict tire rolling resistance and energy loss distribution
- Avoid thermal failure modes induced by self-heating, aerobic and anaerobic ageing, or oxidation
- Utilize durability simulations that account for the effects of oxygen and thermal history
- Deploy a proven, advanced workflow that is "ready to go"
- Diagnose and resolve temperature-dependent issues arising from material properties, component geometry, and load factors to get durability right
- Calculate fatigue life and failure location on your part while accounting for changes in temperature

FEATURES

- Simulate thermal runaway using viscoelastic and exothermic self-heating terms
- Track the diffusion and reaction of oxygen with rubber using Gillen's* Basic Autooxidation Scheme
- Track the evolution of stiffness and crack growth properties as a function of time, temperature, and oxygen uptake.
- Simulate diffusion-limited oxidation effects, including both aerobic and anaerobic ageing behavior



- With Endurica DT, take structural model changes into account due to cyclic softening and/or ageing
- Capture your elastomer's behavior with advanced material models including:
  - WLF/Kraus Hysteresis Models
  - Thermal Runaway
- Support for these procedures:
  - Steady-State Self-heating
  - Transient Self-Heating
  - Structural Coupled or Uncoupled

Endurica
Get Durability Right®

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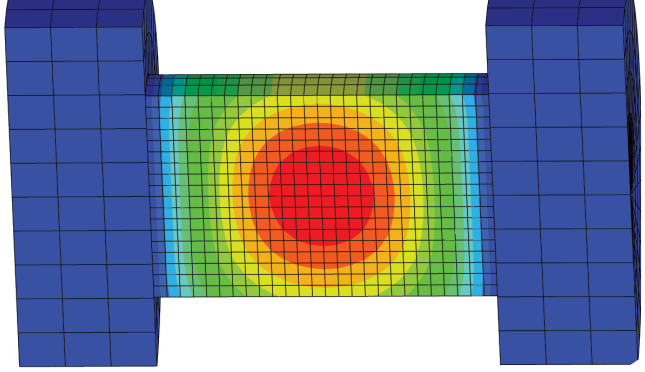
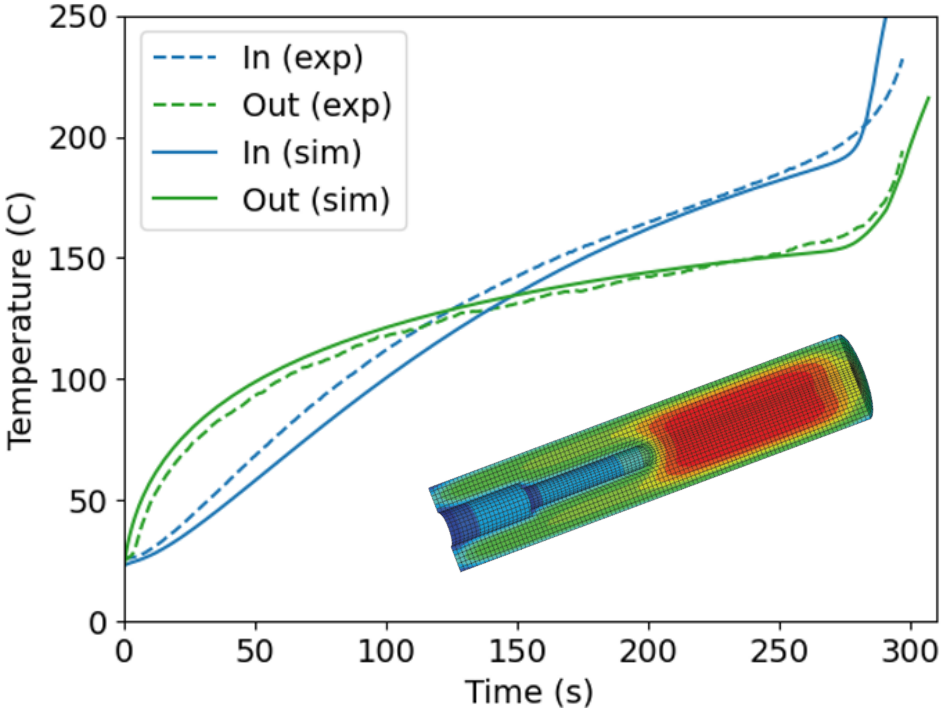
*Gillen, K. T., Wise, J., & Clough, R. L. (1995). General solution for the basic autoxidation scheme. Polymer Degradation and Stability, 47(1), 149-161.



Endurica MP helps identify and avoid the "blowout" failure mode. "Blowout" or thermal runaway is caused by self-heating arising from viscoelastic and thermochemical mechanisms. The graph below shows the transient history of temperature rise in a rotating beam bending test specimen used by the Coesfeld Heat Build Up Analyser. The exothermic release of heat energy during the test leads to a reversion / blowout failure that can be simulated with Endurica MP.



C-SUITE INSIGHTS

YOU KNOW YOU SHOULD

In the real-world, self-heating, oxidation and fatigue occur together. How will you get durability right without taking them all into account?

IMPROVED TIRE ROLLING RESISTANCE

Tools to predict and analyze tire rolling resistance can improve tire design and materials for fuel economy and higher label classification.

UNMATCHED CAPABILITY, RAPID DEPLOYMENT

Our testing and simulation workflow gives you a rapidly deployable solution to account fully for thermal, diffusion and oxidation history on fatigue performance.

EXPERTISE ON TAP

Our software tools are well supported with documentation, examples, and access to the Endurica support team. We are committed to the success of our users.

TAKE THE LEAD

Differentiate your engineering and your product by giving your customers more reasons to trust your materials and your designs. Show them that your solutions work in the real world.

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THE ENDURICA DIFFERENCE

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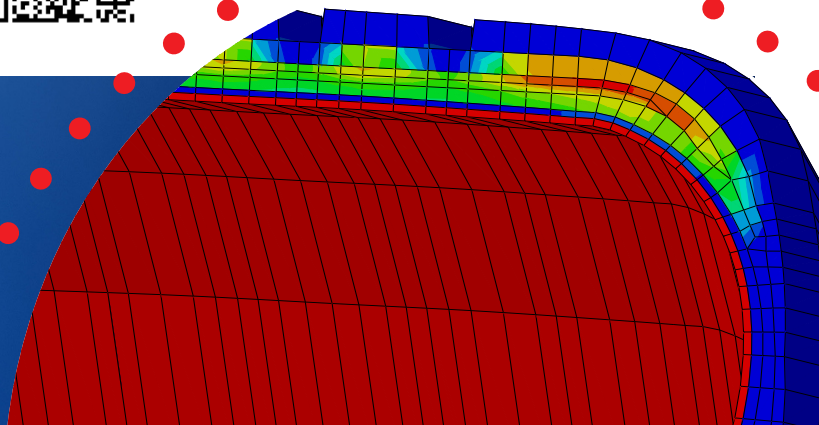
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