Finite Element Modeling of Polymers

Two-Day Training Class

Do you perform FEA of polymer components but don't know the tradeoffs, pitfalls, and benefits of different constitutive models, modeling options, and material test methods?

Do you want to get a **competitive advantage** by using more advanced and accurate FEA techniques?

Join us for a Two-Day Training Course

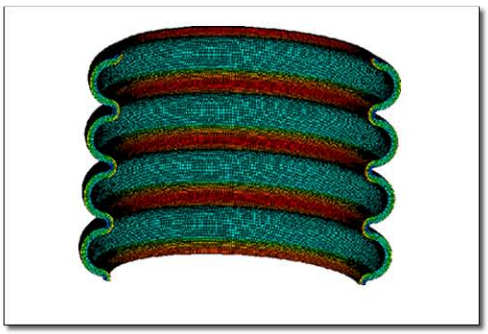
This two-day training class covers a review of polymer mechanics theory, techniques and tools for experimentally characterizing polymers, and hands-on training on how to perform accurate finite element simulations of polymer components. The training class is targeted to people with an interest in designing and analyzing the mechanical performance of parts made from plastics, rubbers, thermosets, or other types of polymers.

November 17 & 18, 2010
8:30am – 4:30pm

Nine Zero Hotel
90 Tremont Street
Boston, MA 02108

Prerequisites

The training class is intended for people with some experience running a finite element program. The examples presented in class will use the commercial finite element program Abaqus. The material models presented in class are available for both Abaqus and ANSYS, and the course is applicable to all finite element codes.



Learning Objectives

By the end of the class you will be able to:

- Design a relevant experimental test program for a new polymer material.
- Know the strengths and weaknesses of various material models, and be able to select an appropriate material model for finite element simulations.
- Use experimental data to calibrate the selected material model.

Course Outline

- Review of polymer mechanics
- Modern mechanical testing techniques for polymers
- Finite element analysis as an engineering tool
- Differences between polymers and metals
- Continuum mechanics review: stress, strain, deformation gradients, invariants, balance laws
- Elasticity/hyperelasticity: review of hyperelastic models
- Review of viscoelasticity theory: strengths and limitations of linear viscoelasticity
- Review of metal plasticity theory: strengths and limitations of metal plasticity models
- User-material models in Abaqus and ANSYS, including advanced viscoplastic constitutive models incorporating rate and temperature dependence
- State variable models
- Failure predictions of polymers
- Advanced finite element simulations of different classes of polymers
- Material parameter extraction techniques using MCalibration and the PolyUMod library of user material models.

Veryst Engineering | 15 Kearney Road | Needham, Massachusetts 02494 | phone 781.433.0433 | fax 781.433.0933 | www.veryst.com

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About the Instructor

Dr. Bergstrom is a Principal Engineer at Veryst Engineering, LLC, and consults primarily in the modeling, testing, and failure analysis of mechanical behavior of polymer materials.

Dr. Bergstrom received his Ph.D. from M.I.T. in the area of computation polymer mechanics, and has lectured in the Department of Mechanical Engineering at M.I.T.

To learn more about Dr. Bergstrom and Veryst Engineering, LLC, visit our website at www.veryst.com

About the Company

Located in the Boston area, Veryst Engineering, LLC is an engineering consulting firm providing services in product design, manufacturing processes, and failure analysis. Veryst Engineering, LLC provides premium engineering and consulting services to companies nationwide. Veryst Engineering, LLC is a user-material software alliance member with both Simulia and ANSYS.

Previous attendees had this to say...

- "I gained a tremendous amount of knowledge on topics which would normally be taught in a semester-long course."
- "Very valuable for design engineers running FEA on thermoplastics and elastomers."
- "Gained a good overall introduction to the mechanics of polymers"
- "I would highly recommend this class to my students."
- "Will/has helped us revisit legacy material modeling and material testing."
- "Great value. Two days of training saved weeks of engineering work."

VERYST ENGINEERING, LLC
Engineering Through the Fundamentals

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Registration

To register for the **November 17 & 18, 2010 Finite Element Modeling of Polymers** course

Complete the form below and submit using one of the following methods:
- Fax: 781.433.0933
- Scan and email to: rvincent@veryst.com
- Mail to: Robin Vincent, Veryst Engineering, 47a Kearney Road, Needham, MA 02494

Deadline for registration is: October 29, 2010

We are pleased to offer a reduced guest room rate at the Nine Zero Hotel, where the course will be held. To take advantage of the savings please contact the hotel directly at 617.772.5837 and mention that you are with the **Veryst Engineering** group. To learn more about the Nine Zero Hotel, visit their website: www.ninezero.com

Class Fee: $1600*

Class Participant Information

Name _____

Company _____

Street Address _____

City _____ State _____ Zip _____

Email _____

Phone Number: _____

Method of Payment

Name on Card _____

Credit Card # _____

Exp Date ____/____

Card Holder Signature _____

*Fee includes 2-day training course, course related materials, breakfast, lunch and refreshments each day. Laptops are provided to course participants for duration of the training.