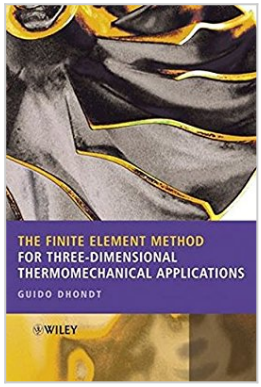


# The Finite Element Method for Three-Dimensional Thermomechanical Applications

*By Guido Dhondt*



**The Finite Element Method for Three-Dimensional Thermomechanical Applications** By Guido Dhondt

Though many 'finite element' books exist, this book provides a unique focus on developing the method for three-dimensional, industrial problems. This is significant as many methods which work well for small applications fail for large scale problems, which generally:

- are not so well posed
- introduce stringent computer time conditions
- require robust solution techniques.

Starting from sound continuum mechanics principles, derivation in this book focuses only on proven methods. Coverage of all different aspects of linear and nonlinear thermal mechanical problems in solids are described, thereby avoiding distracting the reader with extraneous solutions paths. Emphasis is put on consistent representation and includes the examination of topics which are not frequently found in other texts, such as cyclic symmetry, rigid body motion and nonlinear multiple point constraints.

Advanced material formulations include anisotropic hyperelasticity, large strain multiplicative viscoplasticity and single crystal viscoplasticity. Finally, the methods described in the book are implemented in the finite element software CalculiX, which is freely available (www.calculix.de; the GNU General Public License applies).

Suited to industry practitioners and academic researchers alike, *The Finite Element Method for Three-Dimensional Thermomechanical Applications* expertly bridges the gap between continuum mechanics and the finite element method.

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**The Finite Element Method for Three-Dimensional Thermomechanical Applications By Guido Dhondt Bibliography**

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## Editorial Review

From the Back Cover
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About the Author
**Guido Dhondt** obtained his civil engineering degree at the Catholic University of Leuven, Belgium (1983), going on to undertake a Ph.D. in Civil Engineering at Princeton University, USA (1987). Presently, he works in the field of fracture mechanics and finite element analysis at MTU Aero Engines, Germany. He is one of the authors of the free software finite element program CalculiX.

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