



# VUMAT



**Warning:** The use of this user subroutine generally requires considerable expertise. You are cautioned that the implementation of any realistic constitutive model requires extensive development and testing. Initial testing on a single-element model with prescribed traction loading is strongly recommended. The component ordering of the symmetric and nonsymmetric tensors for three-dimensional elements is different from the ordering specified in [Three-Dimensional Solid Element Library](#) and the ordering used in Abaqus/Standard.

User subroutine [VUMAT](#):

- is used to define the mechanical constitutive behavior of a material;
- will be called for blocks of material calculation points for which the material is defined in a user subroutine ([Material Data Definition](#));
- can use and update solution-dependent state variables;
- can use any field variables that are passed in; and
- can be used in an adiabatic analysis, provided you define both the inelastic heat fraction and the specific heat for the appropriate material definitions and you store the temperatures and integrate them as user-defined state variables.

This page discusses:

- [Component Ordering in Tensors](#)
- [Initial Calculations and Checks](#)
- [Defining Local Orientations](#)
- [Special Considerations for Various Element Types](#)
- [Deformation Gradient](#)
- [Objective Stress Rates](#)
- [Defining Effective Modulus to Control Time Incrementation in Abaqus/Explicit](#)

 **Is this page useful?**

**See Also**

**In Other Guides**

[User-Defined Mechanical Material Behavior](#)

[\\*USER MATERIAL](#)