UMAT

Warning: The use of this 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.

User subroutine UMAT:

- can be used to define the mechanical constitutive behavior of a material;
- will be called at all material calculation points of elements for which the material definition includes a user-defined material behavior;
- can be used with any procedure that includes mechanical behavior;
- can use solution-dependent state variables;
- must update the stresses and solution-dependent state variables to their values at the end of the increment for which it is called;
- must provide the material Jacobian matrix, $\mathbf{C} = (1/J)\,\partial\,\Delta\,(J\boldsymbol{\sigma})\,/\,\partial\,\Delta\boldsymbol{\varepsilon}$, for the mechanical constitutive model;
- can be used in conjunction with user subroutine USDFLD to redefine any field variables before they are passed in; and
- is described further in User-Defined Mechanical Material Behavior.

This page discusses:

See Also

In Other Guides

User-Defined Mechanical Material Behavior

User-Defined Thermal Material Behavior

*USER MATERIAL

SDVINI

UMAT and UHYPER