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DYNA2D/PC

An Explicit Two - Dimensional Hydrodynamic Finite Element Code with Interactive Rezoning and Graphical Display

DYNA2D/PC is an explicit two-dimensional, axisymmetric and plane strain finite element code for analyzing the large deformation dynamic and hydrodynamic response of inelastic solids. A contact-impact algorithm permits gaps and sliding with friction along material interfaces. By a specialization of this algorithm, such interfaces can be rigidly tied to admit variable zoning without the need of transition region. Spatial discretization is achieved by the use of 4-node solid element, and the equations-of-motion are integrated by the central difference method. An interactive rezoner eliminates the need to terminate the calculation when the mesh becomes too distorted. Rather the mesh can be rezoned and the calculation continued.

DYNA2D/PC is a vectorized, explicit, two-dimensional, axisymmetric and plane strain finite element code for analyzing the large deformation dynamic and hydro dynamic response of inelastic solids. A contact-impact algorithm permits gaps and sliding with friction along material interfaces. By a specialization of this algorithm, such interfaces can be rigidly tied to admit variable zoning without the need of transition regions. Spatial discretization is achieved by the use of 4-node solid elements, and the equations-of-motion are integrated by the central difference method. An interactive rezoner eliminates the need to terminate the calculation when the mesh becomes too distorted. Rather, the mesh can be rezoned and the calculation continued.

DYNA2D was developed eight years ago at Lawrence Livermore National Lab. and has since been applied in the analysis of large number of problems. Originally, **DYNA2D** had a variety of elements including nine node Lagrange elements, constant pressure variable node elements with four integration points and constant stress quadrilaterals with single points integration. The materials models presently implemented are:

- Elastic
- Orthotropic Elastic
- Kinematic/Isotropic Elastic Plasticity
- Thermoelastoplastic
- Soil and Crushable Foam
- Linear Viscoelastic
- Rubber
- High Explosive Burn
- Fluid
- Isotropic Elastic-Plastic
- Temperature Dependent Elastic-Plastic
- Johnson/Cook Strain Rate and Temperature Sensitive Plasticity
- Power Law Plasticity

DYNA2D/PC is organized to accept new materials models and equations of state of any complexity. The organization permits different materials to have unique storage requirements. All history variables except the stress tensor and the effective plastic strain are packed in a one-dimensional storage vector to ensure that no space is wasted. New models can be added by the procedure outlined in the **DYNA2D/PC** also

We at **Galaxy Advanced Engineering, Inc. (GAE)** have taken steps to make this code available on your PC platform under PC/DOS or PC/Windows95/98 and NT operating system. To obtain the code and more information, please contact our company or call us at (650) 525-1314.