OVERVIEW

• PASSAGE®/PowerCAST software is a 3-D Finite Element program for predicting the manufacturability of cast parts.

• Convective and conductive energy equations, and the Navier-Stokes equations are solved for the filling and solidification processes, allowing engineers to analyze design parameters from concept to production without being finite element experts.

• A user-friendly, pre-processor with mesh generation and capability to read meshes from other mesh generation codes, permits the entering of material properties, process conditions and numerical control parameters interactively.

• The interactive, dynamic post-processor displays interpreted color graphics of standard casting variables in contour, vector and x-y graph forms.

APPLICATIONS

• Sand Castings
• Permanent Mold Castings
• Die Castings
• Lost Foam Castings
• Automotive Parts
• Appliances
PASSAGE®

- PASSAGE® software is a collection of finite element programs for flow, heat transfer and related analyses in 3-D geometries.
- PASSAGE® software consists of the following stand-alone programs:
  - PASSAGE®/FLOW flow and heat transfer analysis.
  - PASSAGE®/DUCT flows through complex passages.
  - PASSAGE®/WHEEL flows through rotating/stationary blade passages.
  - PASSAGE®/SYSFLOW one-dimensional simulation of flow networks.
  - PASSAGE®/DEM flow of small particles in electrical and magnetic fields.
  - dieCAS® filling, solidification, and distortion analysis of die-cast parts.
  - PASSAGE®/PowerCAST filling and solidification of casting processes.
  - PASSAGE®/COMPRESSION compression molding analysis of thin-walled plastic parts.
  - PASSAGE®/FreezeDrying primary and secondary freeze-drying modeling using coupled mass and heat transfer analyses.
- All programs are supported by pre-processors for geometry, mesh, flow/process conditions definition; and post-processors for color results display as x-y graphs, vector and contour plots.

FEATURES

- Coupled flow and energy equations.
- Prediction of temperature distribution of the casting and mold at every time step.
- Prediction of solid/liquid fractions.
- Prediction of porosity/shrinkage.
- Hot cracking prediction.
- Convection/diffusion phase-change:
  - solid region
  - liquid region
  - mushy region
- Interface with thermal stress analysis programs for:
  - elastic strains
  - thermal strains
- Interface with stress analysis for structural integrity of parts under external static and dynamic loads.
- Materials database - metals, cores, risers and sand types.
- Provides mesh generator, a 3-D CAD interface module, and accepts meshes from other mesh generators.
- Runs on most UNIX workstations and supercomputers.
- PASSAGE®/PowerCAST software was developed and is offered exclusively by Technalysis.

BENEFITS

- PASSAGE®/PowerCAST software can minimize the cost and time of traditional prototype building and testing, thus shortening product design cycles.
- Designs can be analyzed and modified on the computer before expensive and time consuming design decisions are finalized.
- Technalysis offers customization of PASSAGE®/PowerCAST software to meet specific customer needs.