FLOW-3D® Cast Version 3.1.1 Features

Meshing & Geometry

- Structured finite difference/control volume
- Multi-Block Gridding with
  - Nested blocks
  - Linked blocks
- Fractional areas/volumes (FAVOR™) for efficient & accurate geometry
- Solids Modeler
- STL-files (geometry) import

Flow Type Options

- Three & two dimensional problems
- Non-inertial reference frames
- Multiple scalar species
- Heat transfer with phase change
- Saturated & unstaturated porous media

Flow Definition Options

- General initial conditions
- Boundary condition
  - Symmetry,
  - Rigid walls,
  - Specified pressure,
  - Specified velocity,
- Restart options
  - Restart previous simulation
  - Overlay boundary conditions from a previous simulation
  - Change mesh
  - Add, delete or change model parameters

Numerical Modeling Options

- Volume-of-Fluid (VOF) method for fluid interfaces-TruVOF
- First, Second and Third order advection
- Sharp fluid interface tracking
- Implicit & explicit modeling options
- Point relaxation & GMRES pressure solver solvers

Thermal Modeling Options

- Natural convection
- Forced convection
- Conduction in fluid & solid
- Fluid-solid heat transfer
- Specified heat flux
- Specified solid temperature
- Heat transfer to voids from fluid/obstacle
- Distributes energy sources/sinks in fluids or solids
- Radiation by emissivity
- Viscous heating

Physical Modeling Options

- Cavitation
- Phase change
- Surface tension
- Thermocapillary effects
- Wall adhesion
- Wall roughness
- Vapor & gas bubbles
- Solidification & melting (heat-of-transformation table)
- Mass/energy sources
- Shear, density & temperature-dependent viscosity
- Thixotropic viscosity
- Elastic stress
- Air entrainment
- Molecular & Turbulent Diffusion
- Adiabatic bubbles

Metal Casting Models

- Solidification & melting
- Solidification & shrinkage
- Microporosity
- Solid fraction dependent latent heat release
- Thermal die cycling
- Thermal stress & deformations
- Defect tracking
- Cavitation potential model
- Lost foam casting model
- Semi solid material model
- Moisture in sand & molds
- Back pressure & vents
- Shot sleeves

Turbulence Models

- Two-equation κ-ε model
- RNG κ-ε model

Porous Media Models

- General flow losses (linear & quadratic) natural convection
- Capillary pressure
- Unsaturated flow
- Heat transfer in porous media

Special Physical Models

- General moving objects
- Porous baffles & obstacles with linear or quadratic flow losses

Automatic Features

- Time-step control for accuracy & stability
- Automatic limited compressibility
- Convergence control

Data Processing Options

- Interactive OpenGL-based graphics
- Color or B/W vector, contour, 3D surface
- Animation output
- PostScript, JPEG, PNG output
- Neutral file output

Supported Platforms

Processors
x86/x86-32
x64/x86-64
Operating Systems
32-bit Windows XP & Windows Vista
64-bit Windows Vista

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