

Hexpress™

Technical Specification

NUMECA, a new wave in fluid dynamics



- **A STAND ALONE MESH GENERATOR FOR NON-NUMECA'S SOLVER AND CSM CODES OR EMBEDDED IN NUMECA'S UNSTRUCTURED CFD SUITE FINE™/MARINE AND FINE™/HEXA**
- **3D GEOMETRIES PURE HEXAHEDRAL CELLS WITHIN PASSAGE AND NEAR SURFACE BOUNDARIES**
- **LIMITED USER INPUT**
- **EASE OF USE:**
 - ▶ **COMPREHENSIVE WIZARD FOR STEP-BY-STEP GRID GENERATION**
 - ▶ **FULLY AUTOMATED TEMPLATES FOR SIMILAR GEOMETRIES**

FEATURES

- Fast and Automatic mesh generator
- Non-conformal all-hexahedra meshes
- Mesh generation in 2 main parts:
 - Domain to mesh preparation (CAD data processing)
 - Mesh generation (Volume to surface, Octree approach)
- Geometry Manipulation Menu
- Domain simplification:
 - Manual Edge/Face Merge/Split utility
 - Automatic Edge/Face Merge utility based on feature angle recognition
- All-hexahedra meshes
 - Accuracy of classical numerical schemes
 - High aspect ratio cells in boundary layer
- Mesh Periodicity
- Multi-domain and FNMB connections
- Multi-block Meshing
- Hybrid mesh generation
- Grid Quality Monitoring
- Interactive mesh correction tool
- Automatic Mesh partitioning (in FINE™/Marine and FINE™/Hexa)
- Face orientation correction in Star-CD surface mesh to STL conversion
- Batch Mode
- 64 bits Mesh Generation

MESH WIZARD

- **Initiate meshing**
 - Transfer your CAD file to a computational domain
 - Automatically set an initial grid for your domain or import a pre-used mesh
- **Mesh refinement/adaptation**
 - Choose generic meshing criteria:
 - surface curvature
 - number of cells between two surfaces
 - Set a target cell size either:
 - locally (close to selected surfaces) or
 - within an interactively created volume
- **Finalize meshing**
 - Automatically snap the grid points on CAD geometry
- **Optimize mesh quality**
- **Insert Boundary Layers** around surfaces and curves
- Possibility to **STOP** meshing process at each step

IMPORT FORMATS

- Direct import for:
 - CATIA V5 (*.CatPart) files:
 - PARASOLID files:
 - STL + properties files (Stereolithographics)
- Through CADfix:
 - Simple and fast file import:
 - IGES

- STEP
- STL
- ACIS
- CADD5
- Pro-Engineer
- Powerful and efficient CAD cleaning tool

EXPORT FORMATS

- FINE/Marine and FINE/HEXA
- STAR-CD
- FLUENT
- CSM code (SAMCEF BACON)

COMPUTER PLATFORMS

- Unix:
 - SGI
 - SUN
 - HP
 - IBM
 - DEC
 - Alpha
 - Itanium 2
 - PA-RISC 64 bits machines
- Linux:
 - Opteron (LINUX 64 bits)
 - Pentium EM64T (LINUX 64 bits)
- Pentium/Athlon (Windows2000, XP)

Automated Unstructured Full HEX-meshing

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