NUMECA introduces a new generation of innovative Hex and Hex dominant meshing tools, covering the whole range of CAE applications, with high quality grids. AutoMesh-4G™ offers dedicated features and capabilities towards specific applications.

AutoMesh-4G™ contains the following meshing tools:

- Advanced Development for Better Products
- www.numeca.com

NUMECA is continuously developing advanced new methods and features and proposes a large range of services to ensure short, medium and long term response to customer needs in grid generation:

Also available at NUMECA:

- FINE™/Turbo: Flow Integrated Environment available for the simulation of internal, rotating and turbomachinery flows.
- FINE™/Design3D: Flow Integrated Environment for the design and optimization of rotating and turbomachinery blades.
- FINE™/Marine: Flow Integrated Environment offering high accuracy flow stimulation for marine applications, such as ships, boats, yachts, containers...
- FINE™/Hexa: Flow Integrated Environment dedicated to complex geometries and multiphysics phenomena covering a large range of industrial applications such as automotive, aerospace, combustion...

AutoMesh-4G™ software systems are available on all major platforms (Unix, Linux, Windows, 32 and 64 bits) as stand-alone software, interfaced with all major CFD commercial solvers and support direct CAD connectivity to most of the CAD systems.

- Adaptation and customisation of HEXPRESS™/Hybrid, HEXPRESS™, AutoGrid5™ and IGG™ towards user's specific requests
- Integration of NUMECA meshing systems into customer's CFD chain
- Development of interfaces towards in-house CFD code

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NUMECA is distributed worldwide: please refer to our website for more details.
NUMECA introduces a new generation of innovative Hex and Hex dominant meshing tools, covering the whole range of CAE applications, with high quality grids. AutoMesh-4G™ offers dedicated features and capabilities towards specific applications. AutoMesh-4G™ contains the following meshing tools:

- **HEXPRESS™**: Unstructured—Full Hex—Non Conformal—body fitted grid generator for arbitrary geometries
- **HEXPRESS™/Hybrid**: Unstructured—Hex Dominant—Conformal—body fitted—Parallel grid generator and CAD cleaner/wrapper for arbitrary geometries
- **AutoGrid5™**: Multi-Block Structured—Full Hex—Conformal and full automatic grid generator for Turbomachinery components
- **IGG™**: Geometry Modeler and Multi-Block Structured Grid Generator

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**Services**

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- .../...
HEXPRESS™
Unstructured Full-Hexahedral Meshing

HEXPRESS™ generates non-conformal body-fitted full hexahedral unstructured meshes on complex arbitrary geometries.

Key features include:

• Full Hexahedral Grids (no prism, no tetrahedra, no pyramid)
• Direct CAD import capabilities
• CAD manipulation and decomposition tools
• Mesh wizard for rapid solution set-up and easy back and forth operation
• Buffer cell and boundary layer insertion for high quality cells in boundary layer regions
• Automatic refinement procedures based on user defined sensors either next to solid walls or at specified area in the domain
• Multi domain capabilities allowing the treatment of CHT and multi-part geometry models
• Full non-matching multi-block connection, allowing multi-row turbomachinery meshing

Customization to User Specific Features

• All commands python based and accessible through scripts
• Users can develop their own scripts for batch mode operation into CAE design cycle or optimization loop

Increase your productivity by at least one order of magnitude
HEXPRESS™/Hybrid
Parallel Unstructured Hex Dominant Meshing for complex and/or unclean CAD geometries

HEXPRESS™/Hybrid is an integrated CAD cleaning and parallel grid generation system creating conformal body-fitted meshes on complex arbitrary geometry.

Key features include:

- Robust and integrated CAD wrapping, cleaning and hole closing
- Level of details selection, based on user selected details
- Full Parallel Meshing on shared memory computers
- Flexible insertion of viscous layers
- Default Hex-dominant meshing with option for full Tetrahedra or Hexahedra meshing
- Built-in mesh deformation engine

HEXPRESS/Hybrid produces a 50 millions cells grid on a full car including underhood in 2 hours on 8 cores, starting from unrepaired STL files.
AutoGrid5™
Automatic Full Hex Multi-block Structured Meshing of Multi-stage Turbomachinery

AutoGrid5™ is a full automatic hexahedral grid generator for all type of rotating machinery and turbomachinery: complex axial, radial and mixed-flow configurations.

Key features include:

- Optimal mesh topology detection based on geometry application and type
- Automatic grid points distribution according to user’s grid size requirements
- Multi-stage and by-pass configurations
- Capture of a large range of geometry features such as tip and hub clearance, rounded and blunt leading and trailing edge, spinners, flow path discontinuities, rotor/stator, inner/row interfaces, non-axisymmetric endwalls, bleed ports, tip basins, part-span shroud, fillets
- Automated meshing of axi-symmetric (2D) effects such as seal leakage, bleed and cooling paths, labyrinths, cavities and more
- 3D effects meshing through advanced template and script technology for automated replay of features such as cooling holes and channels, basin with holes, rib, pin fins, trailing edge grooves, casing treatment and more, including meshing of solid domain
- Grid wake refinement

AutoGrid5™ produces grids in a few minutes, with a few click through a wizard based interface.

AutoGrid5™/Hybrid produces 50 millions of cells grid on a full car including underhood in 2 hours on 8 processors. It is interfaced to all major commercial CFD codes.

AutoGrid5™/Hybrid use a need for a surface mesh. Both systems run in batch or interactive mode and are designed to be integrated in CAE design cycle or optimization loops. Users can develop their own scripts for batch mode operation into CAE design cycle or optimization loops.

Users can take advantage of AutoGrid5™/Hybrid Full Hex Multi-block Structured Griding System to accelerate numerical simulations through automatic generation of high quality grids.

AutoGrid5™/Hybrid is an integrated CAD cleaning and parallel meshing system creating conformal body-fitted meshes on complex arbitrary geometry.

HEXPRESS™ generates non-conformal body-fitted full hexahedral unstructured meshes on complex arbitrary geometries.
Key features include:

- Common CAD formats as import
- Many CAD features based on NURBS curves and surfaces
- Powerful tolerance management system avoiding tedious CAD repair tasks
- Simple and intuitive blocking tool
- Automatic block mapping
- Full automatic block connection tool ensuring grid consistency at the interface between blocks
- Boundary shape clustering
- Snapping functions
- Internal faces and edges allowing full control of block grids
- Algebraic and elliptic smoothers for surface and volume meshes
- CAD projection
- Saving and viewing surface and block grids at different coarse grid levels

IGG supports python scripts for automatic meshing replay into optimization loops.
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