

The New Advanced Intelligent CFD...Easier, Faster, Accurate.



Pumps – Valves - Compressors – Vacuums Turbomachinery

Simply a Better Experience in Computational Fluid Dynamics Simulation

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How Your Teams and Projects Benefit

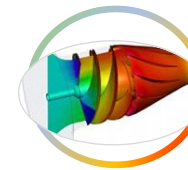
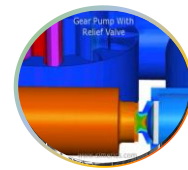
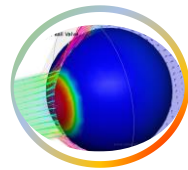
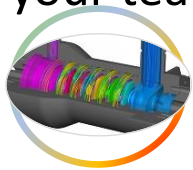
Highly
Accurate

Easier

- Unmatched speed in preparation, setup and processing
- Faster and more robust solving capabilities
- Significantly simplify and shorten very difficult and lengthy tasks
- Reduce prototyping cycles by generating prototype-accurate results
- Fill the workflow gaps between Designer and Analyst teams
- Better utilize the engineers and knowledge experts on your team

Faster

- Complete simulation projects 4X to 10X times faster.
- 10X to 30X faster with MP+
- Reduced time and cost of prototype fabrication and physical testing cycles
- Significantly lower project and OpEx costs – project times, software costs, computing hardware costs
- Get to market faster with better performing and higher quality products
- Increase competitiveness, profitability, innovation and knowledge

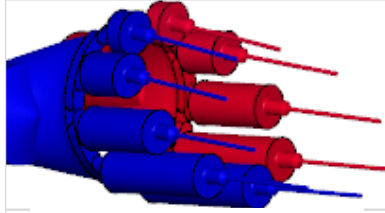


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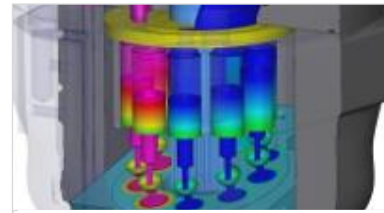
Gerotor Pump



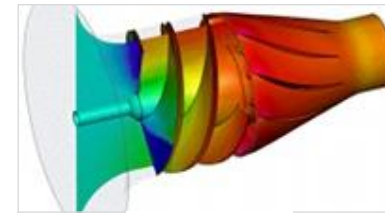
Bent Axis Piston Pump



Rolling Vane Piston Pump



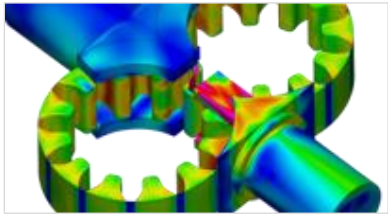
Swash Plate Piston Pump



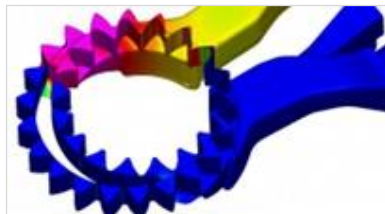
Axial Pump



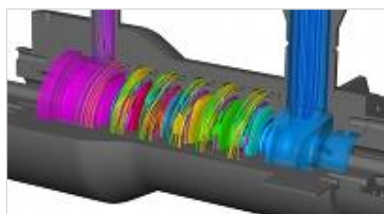
Centrifugal Compressor



External Gear Pump



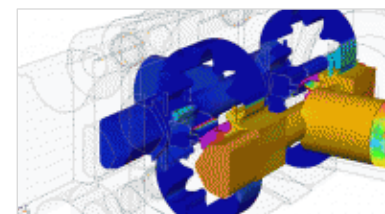
Crescent Pump



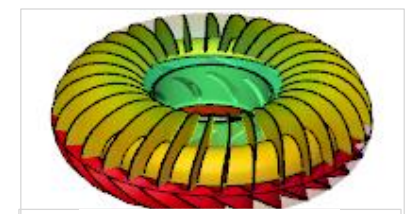
Multistage Pump



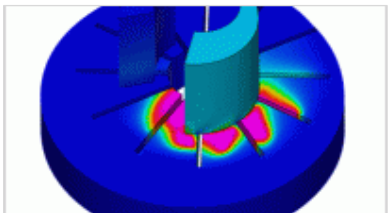
Side Channel Pump



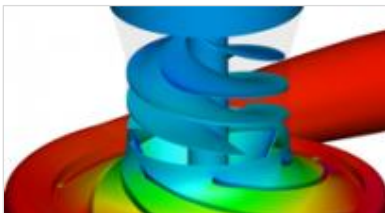
Dual Gear Pump



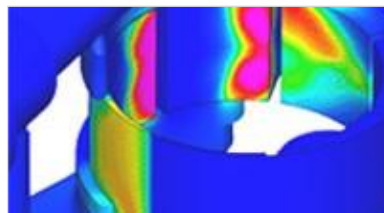
Torque Converter



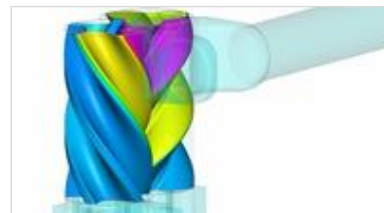
Liquid Ring Pump



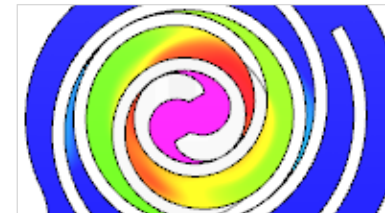
Centrifugal Pump



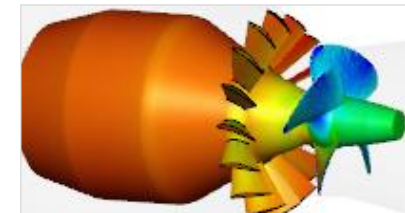
Vane Pump



Twin Screw Compressor



Scroll Compressor



Water Turbine

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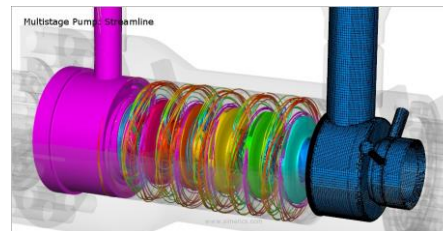
The New Advanced Intelligent CFD...Easier, Faster, Accurate.

CFD Simulation of Pumps, Compressors, Turbo Machines, Vacuums

- SIMERICS-MP delivers entirely new levels of CFD performance and productivity for all types of problems
- SIMERICS-MP is the perfect CFD tool, to efficiently simulate and optimize your turbo machinery
- We provide an intuitive GUI (Graphical User Interface) which results in faster setup and subsequent automated mesh generation. Beyond that, our fast calculation algorithms provide the opportunity to speed-up your simulations, reduce time and increase accuracy

We are providing answers!

- Pump performance pressure head
- Efficiency
- Net Positive Suction Head (NPSH)
- Prediction of cavitation
- Parasitic losses
- Blistering
- Shock wave behaviour
- Leakage
- Axial thrust loads at multistage systems

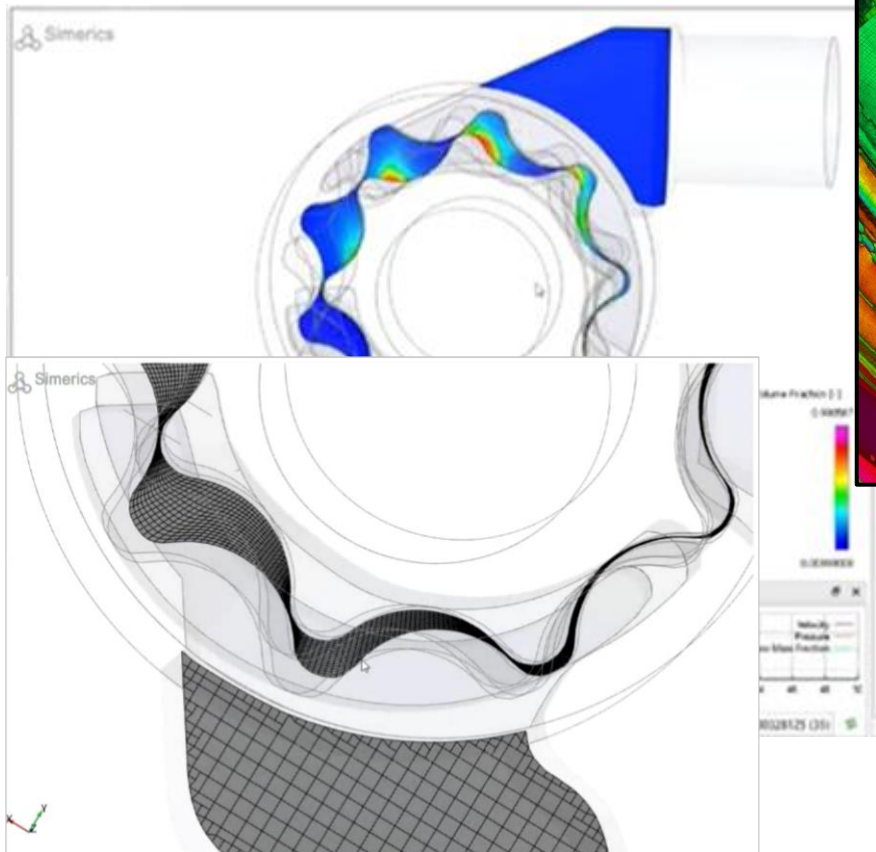


Your Advantages

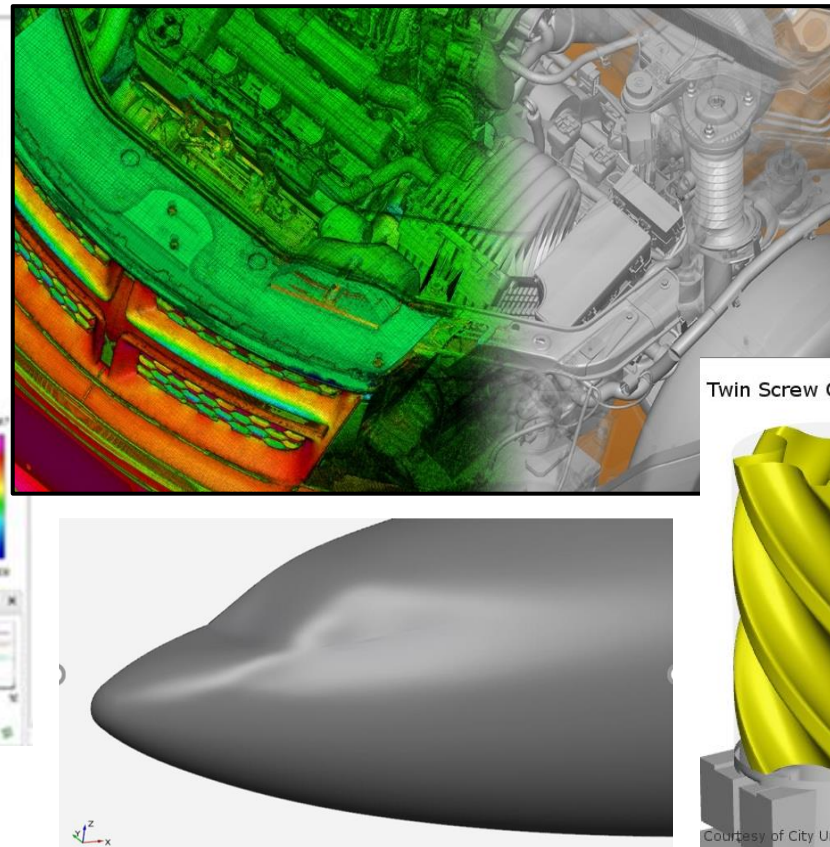
- Simulation of bounded and non-bounded gases
- Cavitation prediction
- FAST simulation speed allows higher accuracy and/or simulation speed-up
- Simulation of complete operating envelope, also including shut-down
- Perfect handling of rotor-stator interface
- Gaps and really small clearances are meshable at high mesh quality
- Prediction of required pump performance with a margin of error <5%

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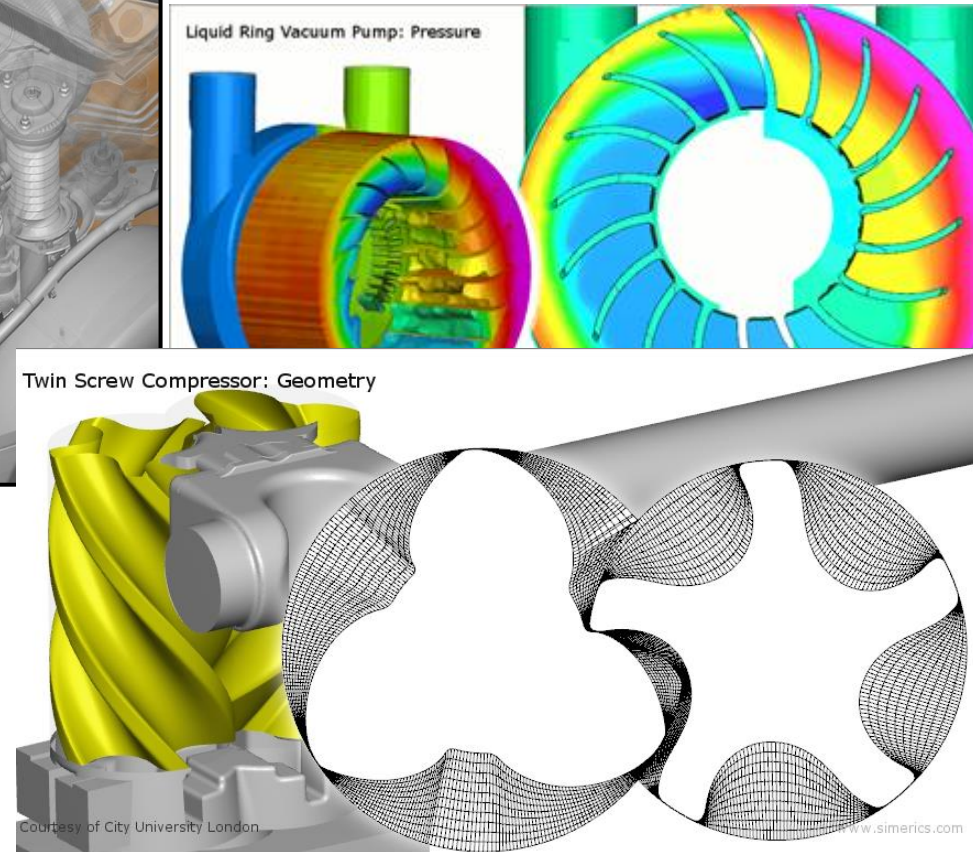
Easier | Meshing



Faster | Meshing



Accurate | Meshing



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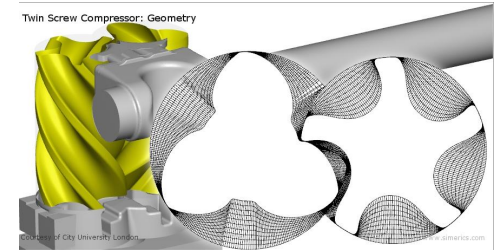
Easier | **Meshing**

Faster | **Meshing**

Accurate | **Meshing**

Simerics-MP/MP+ Automatic Mesher - CAD Flow Body Fitted Mesh

- Uses CAD Geometry/Data
- Designers, Engineers, Analyst
- Binary Tree Mesher Body Fitted
- Sharp edges, thin edges, complex shapes
- High Cell Quality/Solve
- Can Handle Complicated Geometry
- Low Cell Count
- High Accuracy
- Fast Convergence
- Wall Interface (With Advanced Algorithms)
- Easy Local Refinement
- MGI



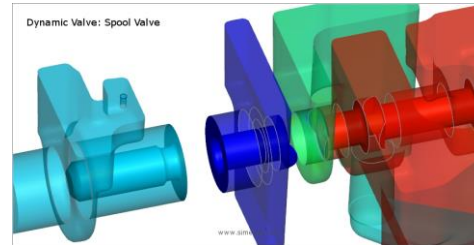
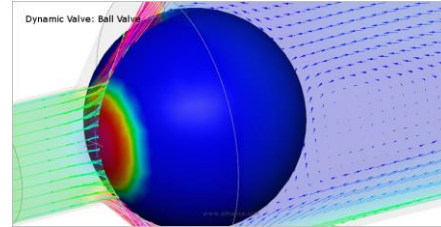
Generates a High Quality Grid Automatically in Seconds/Minutes

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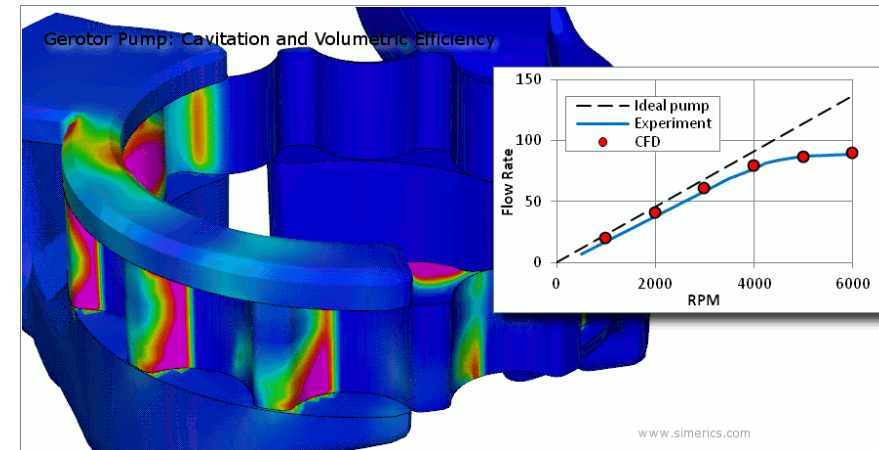
Process Advantages

- **CAD Model Ready** - little to no model clean-up is required
- **Mesh Set-up & Generation** - set-up and mesh complex geometry and micron-sized gaps with ultra-high speed and ease
- **Solving Set-up and Speed** - fast, accurate, robust solver converges very quickly
- **Post-processing** - begins in parallel with solving providing immediate view of results as they develop
- **Intelligent Templates** - highly intelligent and flexible templates remove the complexity of setting up studies and further automates performance



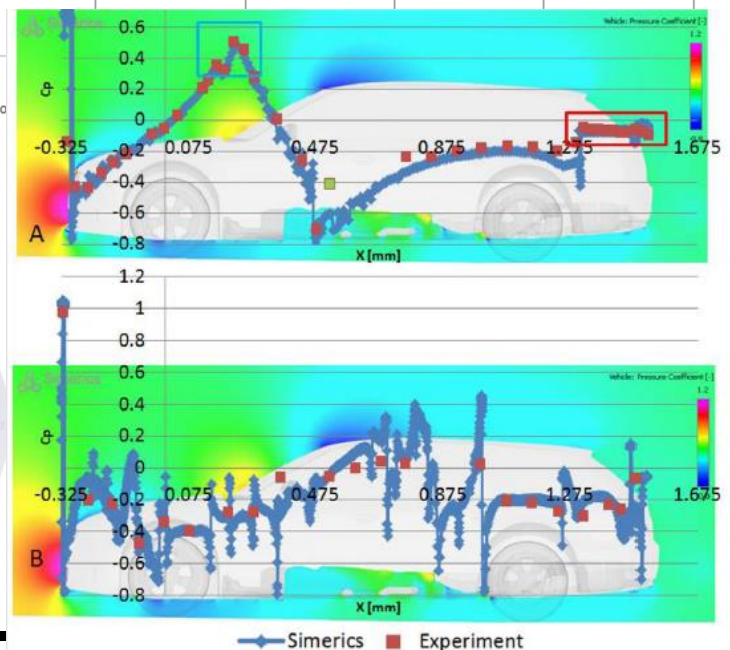
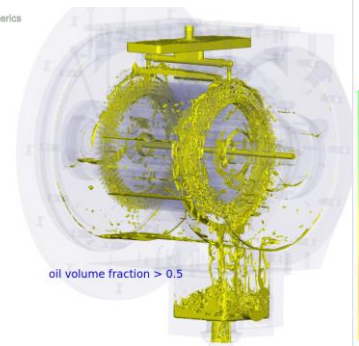
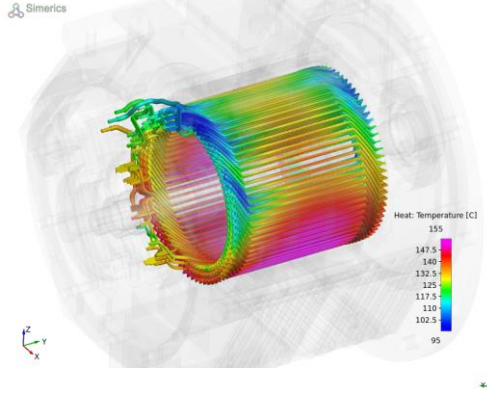
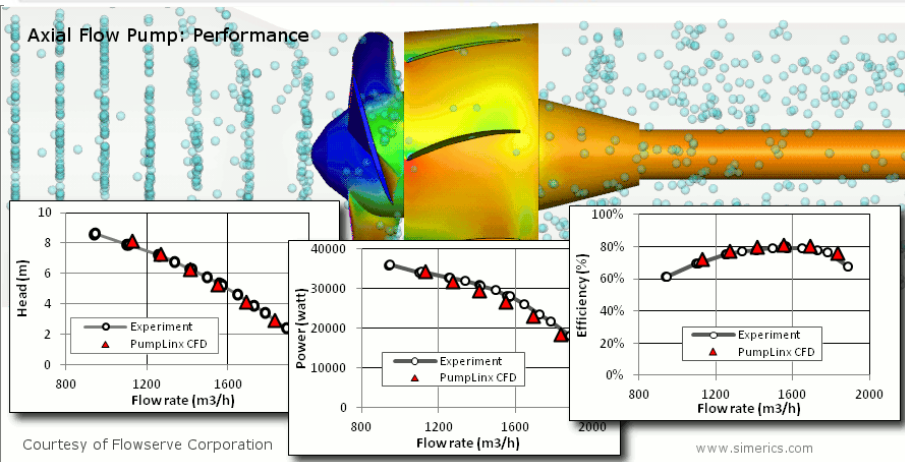
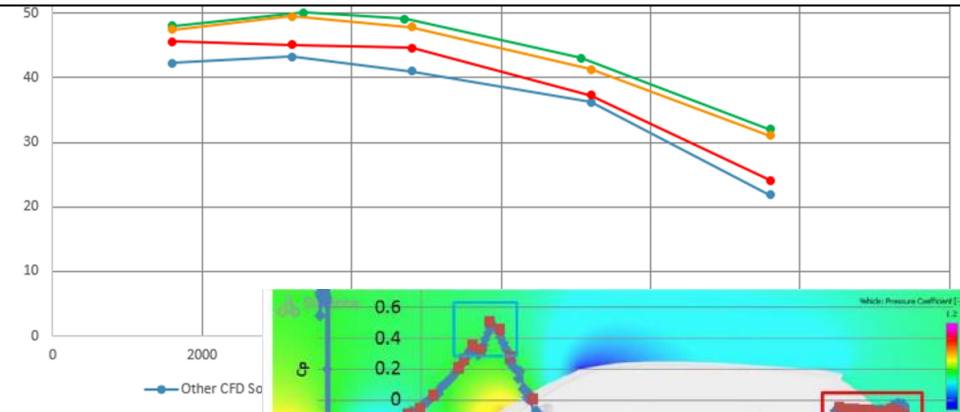
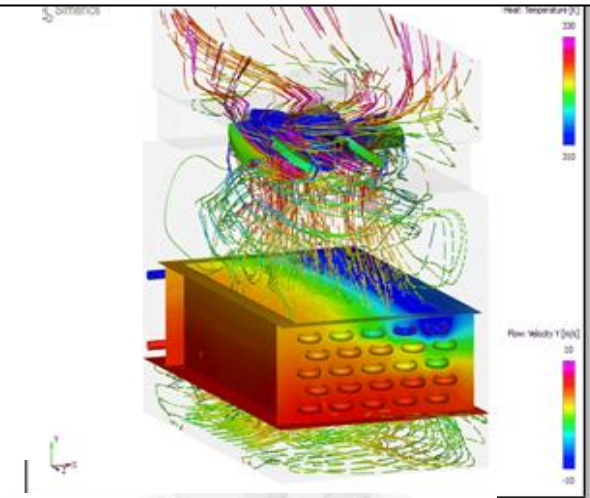
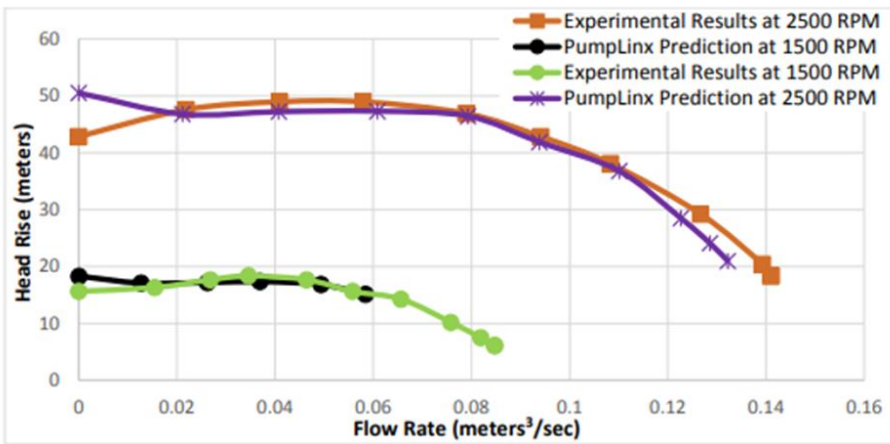
Physics Advantages

- **Transient Studies** - Fast, accurate transient solver that enables switching from steady-state to transient in seconds
- **Multiphase Analyses** - Multiphase solver and workflow that enables switching from steady-state to transient in seconds
- **Cavitation Prediction** - Aeration and cavitation prediction are extremely accurate



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Reduce Time & Expense of Physical Prototypes & Testing



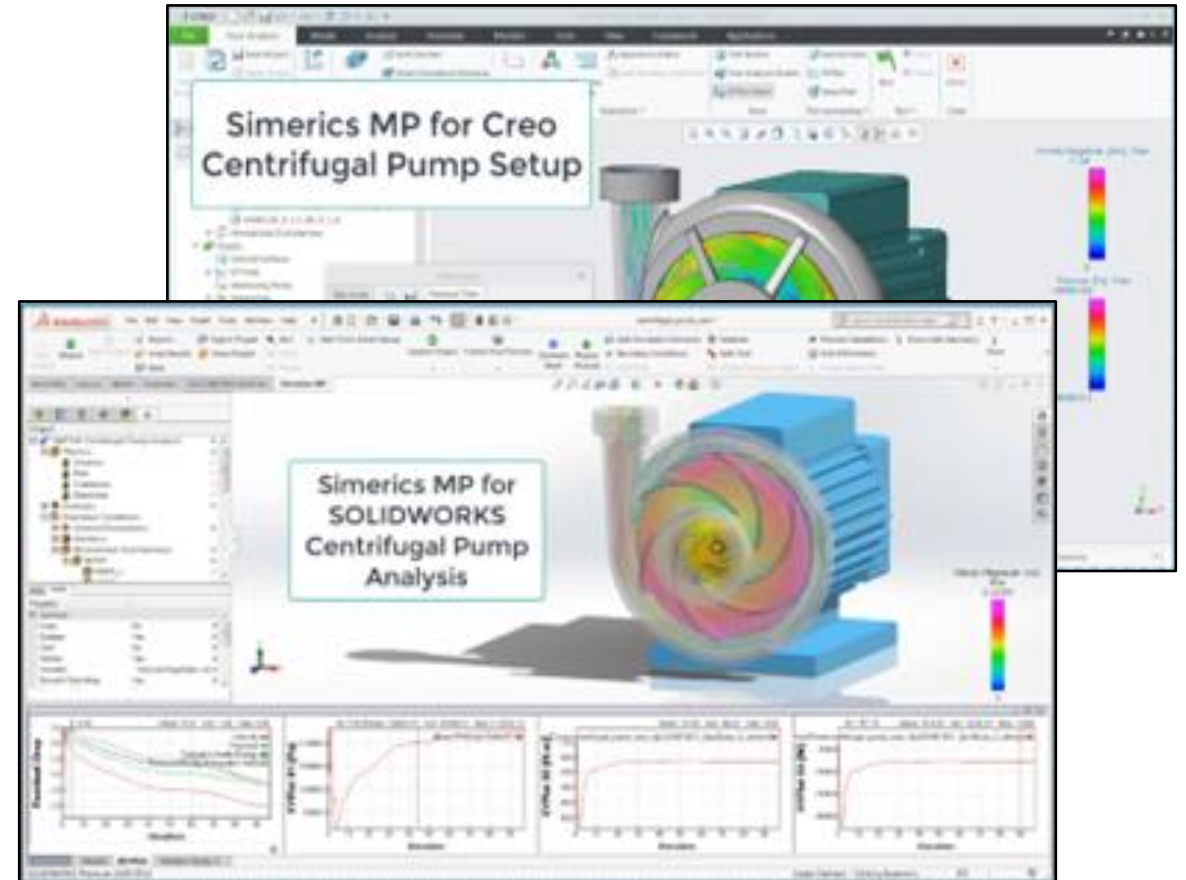
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CAD Embedded Versions – Design Engineering Flexibility

CFD for innovative Design Engineers.

- Simerics-MP for **SOLIDWORKS**
- Simerics-MP for PTC **Creo**
- Simerics-MP for **Siemens NX**
- Rhino Flow-RT for **Rhino3D**
- Simerics-MP for Autodesk® **Fusion 360**®



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Unmatched Workflow Process Efficiencies

Analysts and Engineers spend extensive periods of time setting up and meshing geometry in preparation for studies. Our modern workflows significantly reduce the time required to complete projects. Simerics users experience simplicity and time savings throughout all workflows; geometry prep, meshing, solving and post-processing. An intuitive, single and unified GUI is used throughout. Greater efficiency provides more valuable use of your most valuable resource - Your Engineering Team. Complete projects in shorter time-periods and increase opportunities for optimization and innovation.

CAD Model Clean-up - Little to no model clean-up is required, enabling more collaborative between design and R&D teams.

Mesh Set-up & Generation - [Set-up and mesh](#) complex geometry and micron-sized gaps with ease.

Moving/Sliding Grid & MRF - Meshing automatically anything that moves or rotates.

Solving Accuracy and Speed – Very accurate, fast and robust solver converges very quickly providing end-results in a fraction of the lengthy time typically required for CFD analyses – and with fewer computing resources.

Post-processing - Begins in parallel with solving. View results as they develop immediately. This provides rapid insight to the Analyst/Engineer as to the accuracy of their analysis parameters and assumptions.

Intelligent GUI Templates – A single, unified and intuitive GUI throughout all processes. Highly intelligent and flexible templates remove the complexity of setting up studies and provide unmatched performance and reductions in time and effort.

Multi-CAD Options – The stand-alone version of Simerics-MP and MP+ are also available as tightly integrated, [CAD-embedded](#) versions for use within PTC Creo, Siemens NX, Autodesk Fusion 360 and SOLIDWORKS.

Ease-of-Use & Technical Support –Ease-of-use removes barriers to adoption. Typical training 1-2 days. Unlimited Support.

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Transient Studies - Fast, accurate Transient solver quickly converges and also enables switching from steady-state to transient in seconds. This facilitates the ability to leverage fast steady-state studies for multiple options and very quickly convert to more accurate transient studies once the best options are determined

Multiphase Analyses – Robust, efficient Multiphase solver outperforms competing technologies and also provides very accurate free surface analyses.

Cavitation Damage/Loss Prediction – Models both free and dissolved gases and very accurately predicts [cavitation, cavitation damage](#), aeration, leakage and parasitic losses.

Small Gaps/Clearances – Unique ability to handle micro-level gaps and clearances removes the limitations encountered in using most CFD analysis solutions. Gaps are implicitly included in analyses, removing the need to estimate, guess or ignore.

Noise and Vibration - Predict, understand 3D pressure ripples and reduce noise and vibration in a fluid system.

Loads/Pressure Forces – Flow rates, pressures, loads, torques, power and efficiency and all implicit to studies and can be solved for in parallel.

Thermal – [conjugate heat transfer](#) (conduction, convection, radiation) can be solved accurately, even between the solid/fluid interface.

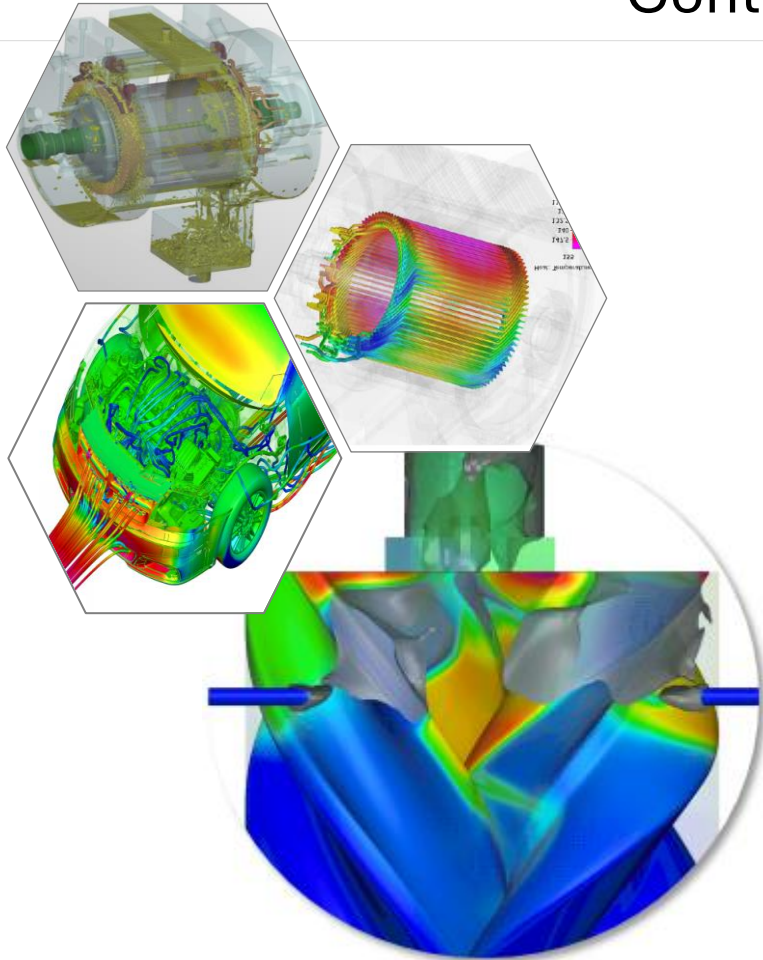
Other – Multicomponent (multiple gases and densities), Dynamics (fluid and solid interaction), Particle, Species (mixing of liquids with similar densities).

Geometry Modifications & Optimization – Geometry modifications during the optimization process can easily and quickly be re-meshed and the parameters of the prior study(ies) are retained. In addition to its own Optimization Module, Simerics also integrates well with 3rd party optimization and design technologies such as SCORG, CAESSES and CFturbo.

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Contact us to Schedule a Demonstration:



Understand How To Reduce:

- Hardware prototype costs
- Manufacturing set up costs
- Tooling costs
- Operational (OpEx) savings for you and your company
- Experience the New Advanced CFD!

info@virtura3d.com

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