

CFD Analysis Specifically Developed to... Shorten your Path



Fans – Blowers – Turbines – Propellers - Ventilation

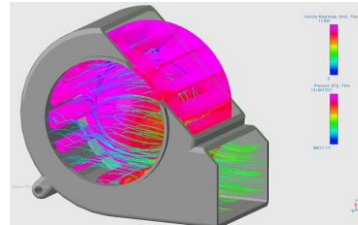
Simply a Better Experience in Computational Fluid Dynamics Simulation

Fans - Blowers - Turbines - Propellers - Ventilation of All Types

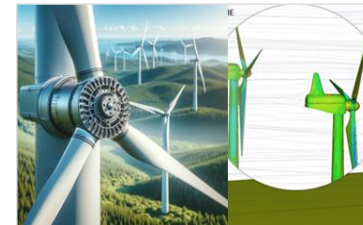
Simerics-MP and **Simerics-MP+** are uniquely positioned to very quickly and accurately simulate and optimize turbomachinery, in applications for fluid flow, pressure, fluid mixing, energy production, propulsion, conjugate heat transfer and ventilation.

Outputs include head rise, power, efficiency, parasitic losses, pressure waves, noise, axial and side loads, torque, aeration and cavitation.

Easy-to-use, high-quality meshing includes sliding/rotating/deforming grids required for turbomachinery.



Centrifugal Blowers



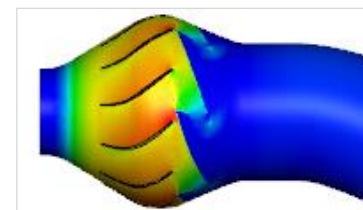
Wind Turbines



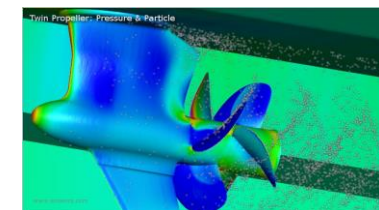
Fans



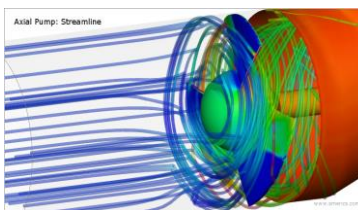
Hydraulic Turbines



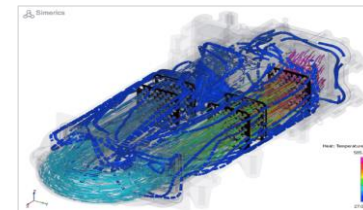
Waterjets



Propellers



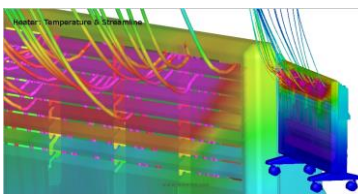
Axial Blowers



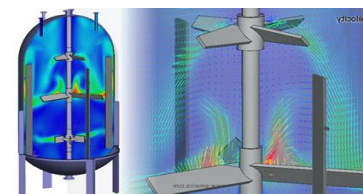
Vehicle Ventilation



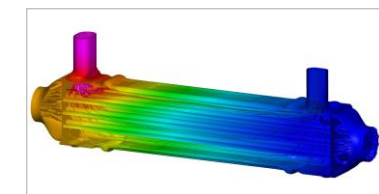
Room Ventilation



Heaters



Mixing Tanks



Heat Exchangers

Deliverables that Shorten Your Path to Better Outcomes

How we shorten your path:

- ❖ 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.

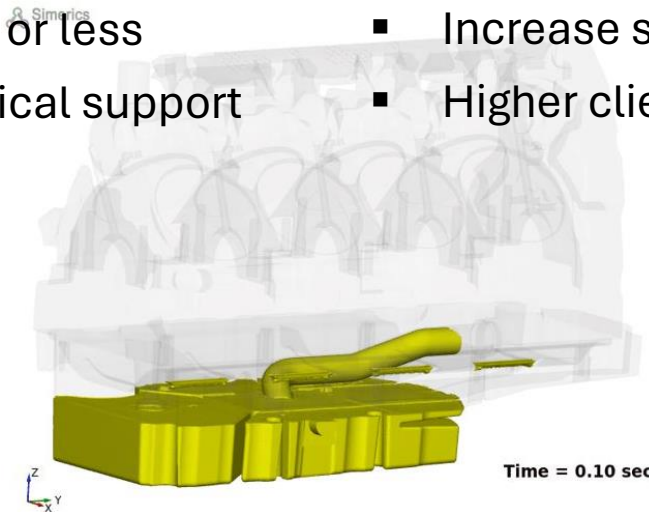
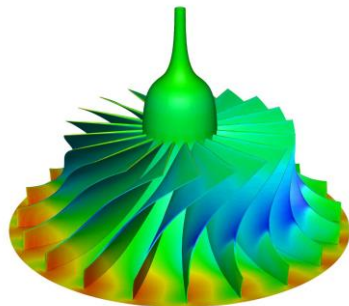
How you benefit:

- 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.
- Better utilize the engineers and knowledge experts on your team.
- Fill the workflow gaps between Designer and Analyst teams.
- 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.

Engineering & Business Benefits

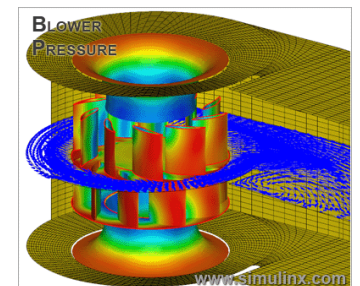
Engineering Benefits

- Reduce prototypes and physical testing
- Little to no model cleanup
- Improved Designer/Analyst collaboration
- Greater ease-of-use and short adoption
- Significantly faster and easier meshing
- Accurate results to within 2% to 5%
- Complete projects much faster
- Short training period – 2 days or less
- Unlimited, unmatched technical support



Business Benefits

- Reduced product development time
- Lower prototype costs and cycles
- Shorter time to market and delivery times
- More time for product optimization
- Lower investment in software and staff
- Enable and increase time for innovation
- Better product performance and quality
- Increase staff knowledge & performance
- Higher client satisfaction and profitability



Competitive Advantages over Legacy CFD Solutions

Unmatched Process Efficiencies - Analysts and Engineers spend extensive periods of time setting up meshes and meshing geometry in preparation for solving studies. Our superior workflows and built-in intelligence significantly reduce the time required to complete projects. Simerics-MP/MP+ 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. By completing projects within much shorter time-periods, opportunities for optimization and innovation and the ability to improve quality are greatly enhanced.

CAD Model Clean-up - Little to no model clean-up is required, streamlining collaborative efforts between and freeing up time for the design team and CFD analysts.

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.

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 Simerics-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 – Unmatched ease-of-use removes barriers to adoption. Training is complete with 2 days or less. Unlimited, comprehensive and personal levels of technical support are unparalleled in the industry.

Capabilities - Physics - Analysis Types

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 option(s) is/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-MP/MP+ also integrates well with 3rd party optimization and design technologies such as SCORG, CAESES and Cfturbo.

Learn More – Watch the Videos

Watch on YouTube

Complex Analyses Made Easy



Fans Blowers Turbines



CFD within Your CAD GUI



Accurate Cavitation Prediction



Simerics-MP/MP+ Clients Include..



Rolls-Royce



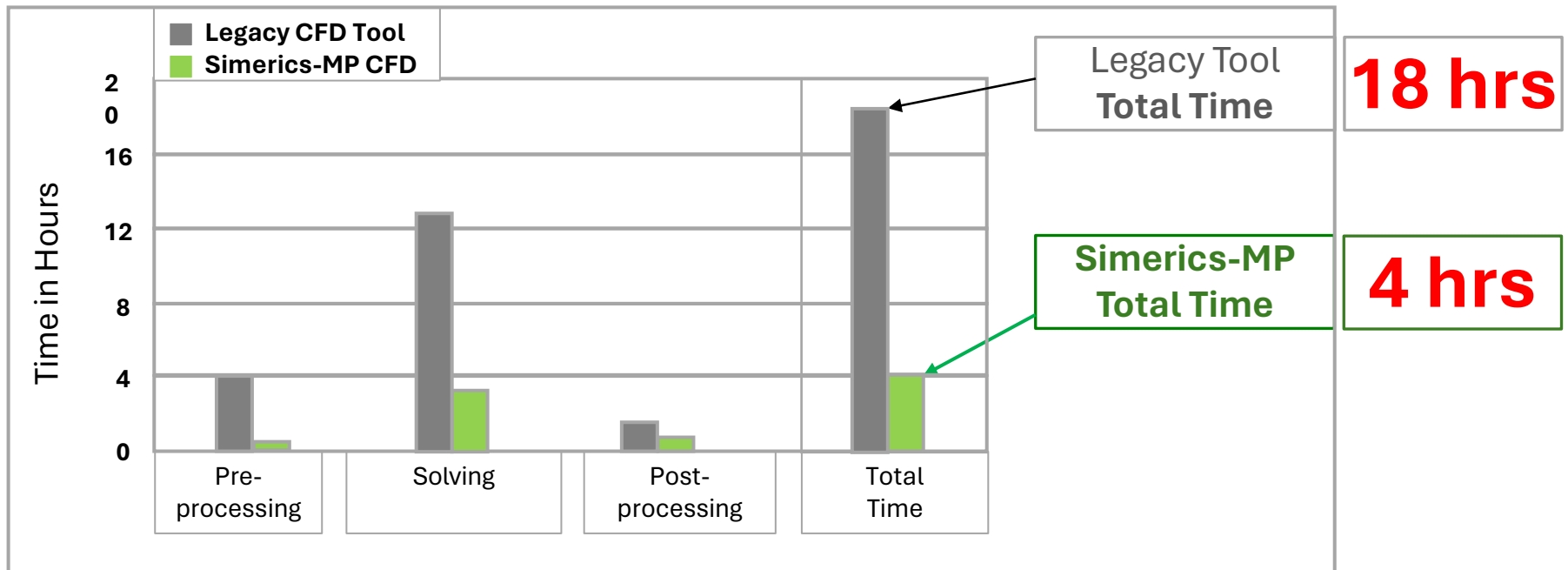
Rexroth
Bosch Group



Complete Projects 4x to 5x Faster as a Minimum

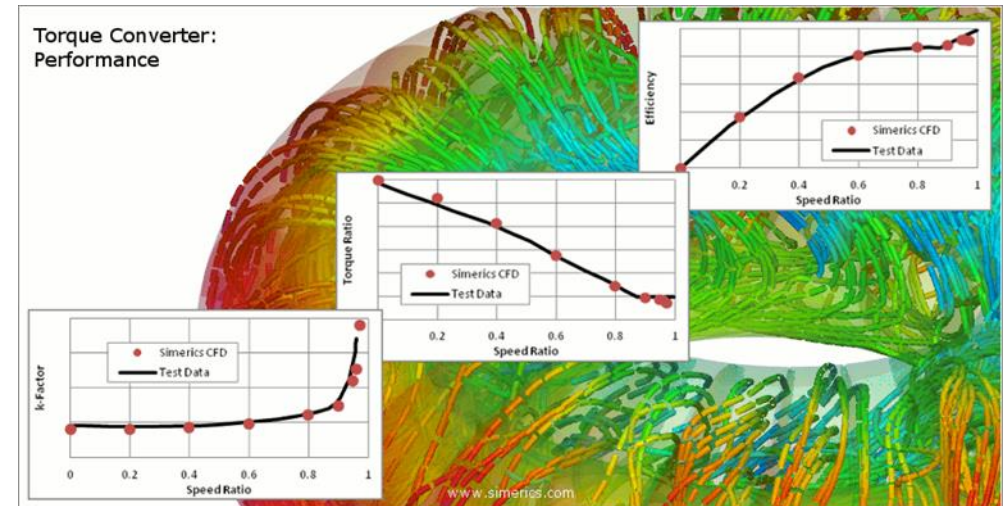
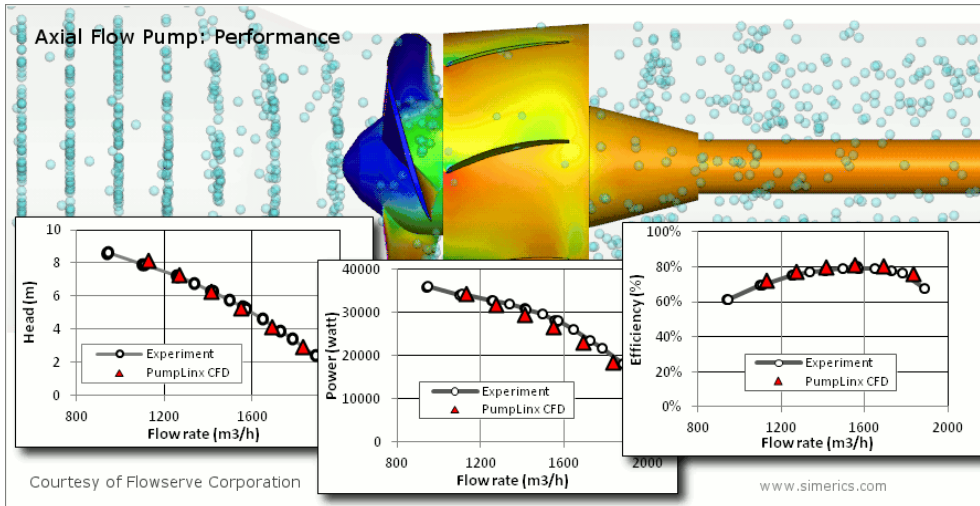
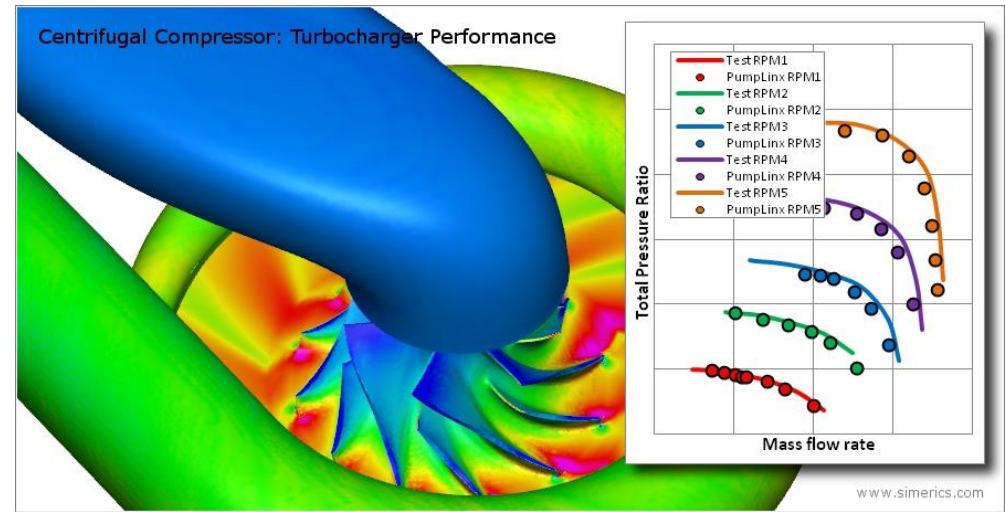
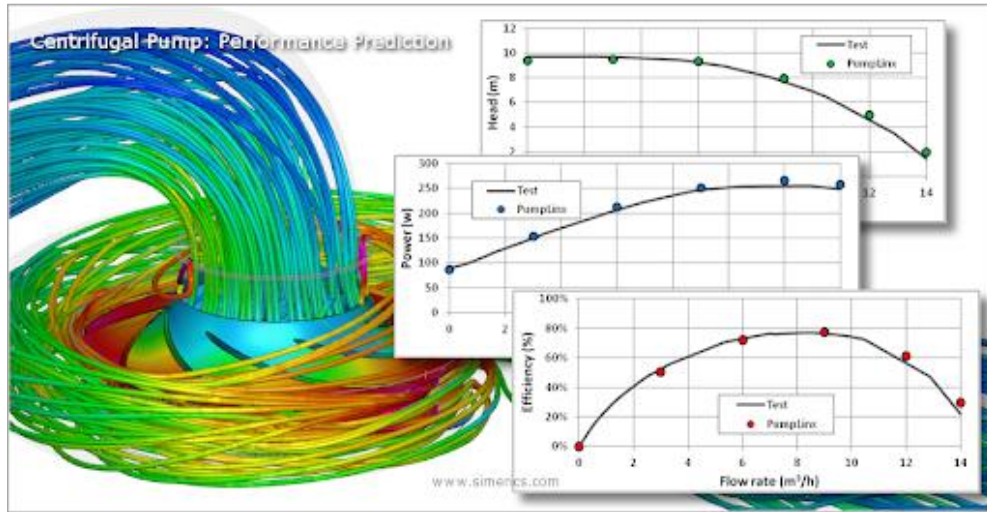
Complete Projects 4X to 10X Faster with Simerics-MP Complete Projects 10X to 30X Faster with Simerics MP+

(Results of University Client benchmark using Simerics-MP against their legacy CFD tool)
(~8x faster meshing ~ 3.5x faster solving ~ 2x faster post-processing)



Recommended System Configuration: Typical 3D CAD workstation with 32GB system memory, 8 processor cores, any OpenGL graphics card. Simerics-MP/MP+ is delivered with a minimum of 8 core capacity. Additional cores and MPI are available.

Highly Accurate - Within 2% to 5% of Physical Test Results



What Customers Have to Say

Simerics-MP+ is the perfect CFD tool for Hyundai - Simerics-MP+ Testimonial from Hyundai-Kia Motors

There are many CFD tools to choose from; however, there is no doubt that Simerics-MP+ is the perfect CFD tool for multiple automotive applications. Hyundai successfully uses Simerics-MP+ for the analysis of cavitation and pressure fluctuation in its fluid power systems, and specifically, its pumps and valves. Simerics-MP+ is impressive because it is able to simulate transient fluid dynamic effects for automotive pumps; plus, I am very satisfied with the cavitation modeling capabilities of Simerics-MP+. It is uniquely suited to deal with very small gaps where cavitation can occur. I look forward to utilizing Simerics-MP+ even more in the future as new developments are released.

Tae-Gyun Kim, Research Engineer, Corporate Research & Development Division Hyundai-Kia Motors

Simerics-MP+ Helps Transmission Oil Pump Design - Simerics-MP+ Testimonial from Ford Motor Company CAE/VSA Supervisor

I'm pleased to let you know that CFD engineers in my section at Transmission & Driveline Engineering (TDE), Ford Motor Company have been successfully using the CFD package, Simerics-MP+, developed by your company to support the transmission oil pump design and release. We found that Simerics-MP+ is easy to-use, fast, and very robust in creating pump virtual models to predict the flow performance exhibited in gerotor and vane pumps. The applications of Simerics-MP+ have effectively helped us eliminate many technical bottlenecks and increase our analysis throughput. We are thrilled about the opportunity to support our engineering team to investigate more design alternatives and sort out potential design weaknesses analytically. I can see that in a shorter term, the final design of our pumps will be more robust, the concept decision will be made faster in response to system demands. In a longer term, I expect that we will be able to translate many innovative ideas of pump designs to positive customer perception of the superiority of our vehicles' NVH quality.

Chin-Yuan Perng Supervisor, Dynamics CAE & VSA ATEO, Ford Motor Co.

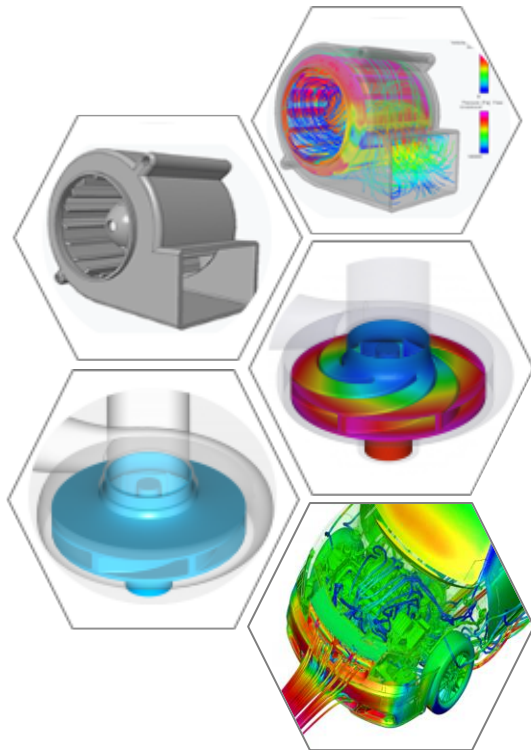
Simerics-MP+ Helps Magna Powertrain Design Better Pumps - Simerics-MP+ Testimonial from Magna Powertrain:

Magna Powertrain, Engine Technologies Group, Concord Ontario acquired the simulation software Simerics-MP+ in 2006 to support its oil pump development team whose main responsibility is the design of gerotor and vane pumps. The team has proved that the code provides accurate results with the pre-processing/setting time reduced to as low as two hours using the Simerics-MP+ templates and the automatic mesh generator. Simulations were performed in a short period of time which allowed us to compare three or four design options back to back and to make the best possible decision before building the prototypes. Simerics-MP+ was very useful in addressing issues related to cavitation discovered in the first stage design. The cavitation was either eliminated or reduced to a minimum in the second stage design. Overall, Simerics-MP+ has proved to be a very useful, user-friendly tool designed especially for pump designers to help them make the best possible design decisions to meet or exceed the customer expectations.

Romulus Crisan, P.Eng., Magna Powertrain FEA Engineer, Engine Transmission Components Group 800 Tesma Way, Concord, ON, L4K 5C2

Complimentary Consult & Contact

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

Begin Your Path to Better Outcomes!

info@virtura3d.com