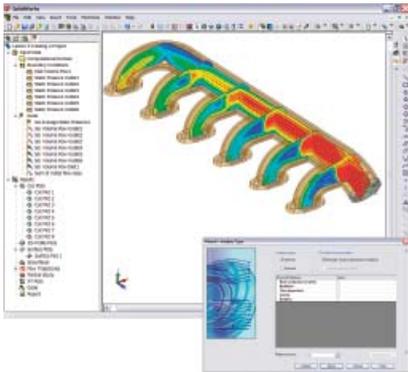


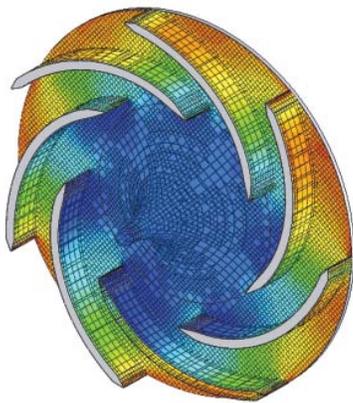
# COSMOSFloWorks OVERVIEW

EASILY SIMULATE LIQUID AND GAS FLOWS WITHIN SOLIDWORKS

COSMOSFloWorks™ is the first easy-to-use fluid flow simulation and thermal analysis program that is fully embedded inside SolidWorks. Understand, validate, and improve new product ideas during the design phase ... not after!



COSMOSFloWorks powerful wizard based user interface and goal based flow analysis makes it easy for you to perform flow analysis on virtually any SolidWorks model, like this exhaust manifold. Understanding how much gas moves through each individual outlet of the manifold allows you to make design modification in order to attain specific design criteria.



Identify structural failures that can occur due to fluid pressure regions by combining the analysis power of COSMOSFloWorks and COSMOSWorks®. Plot the pressure distribution profile in COSMOSFloWorks and easily transfer these pressures to COSMOSWorks to perform a stress analysis.

The original fluid flow simulation tool developed exclusively for SolidWorks users; COSMOSFloWorks gives you insight into parts and assemblies related to fluid flow, heat transfer and forces on immersed or surrounding solids.

## The only fluid flow simulation product fully integrated with SolidWorks.

COSMOSFloWorks is incredibly easy to use; you simply tell the software what you're interested in instead of having to translate analysis design goals into numerical criteria and iteration numbers.

- Engineering goal based flow analysis.
- Compare different designs based on flow analysis using SolidWorks configurations and choose the optimal design for final production.
- A wizard based approach to setup flow problems.
- Automatic generation of fluid volume based on your SolidWorks assembly. No need to create fluid volume as a separate component.
- All flow parameters are associative with your SolidWorks geometry and automatically update with changes in your design.

**Physical Models for engineering applications.** COSMOSFloWorks can analyze a wide range of real fluids such as air, water, juice, ice cream, honey, plastic melts, toothpaste, and blood, which makes it ideal for engineers in nearly every industry.

- Internal flow: Flow of liquids and gases through valves, regulators and ducts.
- External flow: Flow of liquids and gases around solid bodies like flow of air over an airplane or flow of water around a submarine.
- Transient flow: Simulate unsteady flow over a short period of time.
- Turbulent flow: K-E model to understand turbulence in the flow domain, for example the flow of gases from an aircraft engine nozzle.
- Incompressible viscous flow.
- Compressible flow: Analyze gas flows in subsonic, transonic, and supersonic speed zones like flow around an aircraft engine moving at the speed of Mach 1.
- Heat Transfer: Conduction, Convection (Natural and Forced convection).
- Wall roughness: Calculate pressure drop on pipes based on its surface roughness value.
- CFD based Design Optimization: Optimize your design based on model dimensions and flow parameters.
- Porous Media: Simulate components like industrial filters or catalytic converters to understand how they effect your designs.
- Rotating reference frame: Understand complex rotational flow inside turbo machinery (like pumps, impellers etc).
- Non Newtonian Liquids: Solve flow problems involving liquids like blood, toothpaste, and plastic melt.
- Moving Wall: Study flows relative to a moving reference frame.
- Radiation: Study heat transfer exchange between high temperature surfaces and also radiation from the sun (solar radiation).

### Primary Industries Served

- Aerospace
- Automotive
- Biomedical
- Consumer products
- Fans
- Food Processing
- Glass and Ceramics
- HVAC/Refrigeration
- Industrial Hygiene
- Machinery
- MEMS
- Power plant
- Process
- Pumps
- Valves and Regulators

### Supported Languages

- English
- Japanese

### System Requirements

- SolidWorks 2006 or higher
- Microsoft® Windows XP Professional or Windows 2000 recommended
- Intel® Pentium™, Intel® Xeon™, Intel® EM64T-, AMD® Athlon™, or AMD® Opteron™ based processor
- 512 MB RAM or greater
- Pointing device
- CD-ROM drive
- Microsoft Office XP or Microsoft Office 2000
- Internet Explorer version 6.0 or later recommended

**Simulate real-world operating conditions.** COSMOSFloWorks includes several types of boundary conditions to represent real-life situations.

- Apply inlet velocities, pressures, mass or volume flow rates, and fans.
- Apply mass or volume fraction if multiple gas types are involved.
- Simulate the effect of heat generation by applying surface or volume heat source.
- Simulate the effect of cooling by applying natural or forced convection.
- Simulate rotating parts by applying one or more rotating frame of reference.
- Study the effect of heat sinks on electronic components with heat sink emulation.
- Simulate the effect of solar radiation.
- Track the behavior of particles suspended in a flow.
- Apply time and coordinate dependent boundary conditions and heat sources.

**Automate fluid flow tasks.** COSMOSFloWorks utilizes a number of automation tools to simplify the analysis process and help you to work more efficiently.

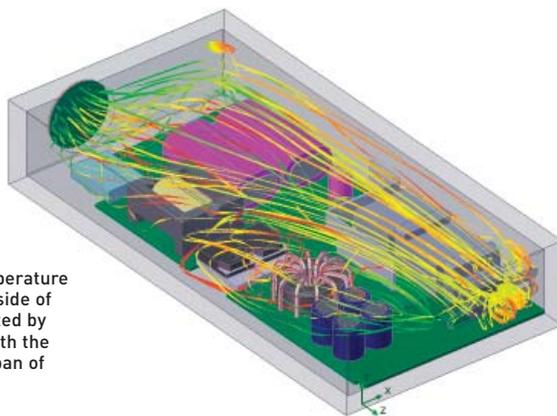
- Detect fluid volume automatically from SolidWorks geometry thereby distinguishing between solid and fluid regions.
- Mesh both fluid and solid regions automatically.
- Solution adaptive mesh generation to improve accuracy.
- Automatically create goal plots to evaluate pressure drop and temperature distribution once the analysis is complete.
- Save time with a built-in engineering database of commonly used liquids, gases, solid materials, fans and units, or customize it with your own materials.

**Interpret results with powerful and intuitive visualization tools.** Once you have completed your analysis, COSMOSFloWorks offers a variety of results visualization tools that allow you to gain valuable insight into the performance of your models.

- Study the distribution of result quantities with section plots (including velocity, pressure, vorticity, temperature, mass fraction etc). The section plots can be moved dynamically.
- Measure results at any location with probe tool.
- Graph result variation along any SolidWorks sketch.
- List results and automatically export data to Microsoft Excel.
- Examine the flow trajectory inside or around the model with animated bands, 3D arrows, or spheres.

**Collaborate and share analysis results.** COSMOSFloWorks makes it easy to collaborate and share analysis results effectively with everyone involved in the product development process.

- Generate customized engineering reports in Microsoft Word format.
- Save result plots in several standard formats, such as BMP and JPEG.
- Export animations of results as an AVI.
- Publish eDrawings files with analysis information.



COSMOSFloWorks can plot the temperature distribution and direction of flow inside of electronic enclosures. Heat generated by components dramatically affects both the performance and operational life span of electronic devices.

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