

COSMOSFloWorks

EASILY SIMULATE FLUID 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!

The original fluid flow simulation tool developed exclusively for SolidWorks users, COSMOSFloWorks enables you to understand, validate, and improve your designs immediately within SolidWorks so you can design not just better, but smarter.

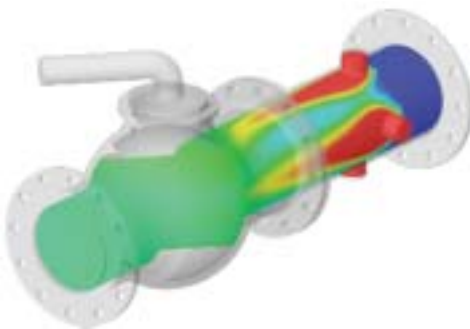
Optimize the quality of your SolidWorks designs. COSMOSFloWorks gives you insight into the physical dynamics of parts or assemblies related to the flow of gas, liquid, heat transfer and forces on immersed or surrounding solids. Using COSMOSFloWorks, you can save resources by conducting tests on virtual prototypes, shorten time-to-market by creating better designs faster, and reduce outsourcing.

The only fluid flow simulation product fully integrated with SolidWorks. Unlike other fluid flow programs, COSMOSFloWorks allows users to immediately create designs and analyze them without having to transfer the data to the analysis code. COSMOSFloWorks is incredibly easy to use; you simply tell the software what you're interested in instead of having to translate analysis goals into numerical convergence criteria, iteration numbers, and relaxation factors.

Enhanced applications suitable for a wide variety of industries.

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

- Designers of electronic devices (computers, audio/video, etc.) can check for efficient cooling by simulating convection and conduction within their designs;
- Land-, air-, and marine-vehicle designers can achieve maximum performance at least cost: manifolds, brake systems, engine cooling jacket, flow around a wing or through a rocket nozzle, flow around an immersed body;
- Hydraulic/pneumatic systems manufacturers can improve their designs regarding flow distribution and pressure drop;
- HVAC equipment manufacturers can optimize product performance: flow through ducts, heat exchangers, flow and temperature distributors in rooms to determine duct locations, etc.
- Chemical process and oil industry can better understand flow through valves or mixing vessels, etc.



COSMOSFloWorks supports a wide variety of real gasses and fluids for both internal and external flow analysis.

CAD integration

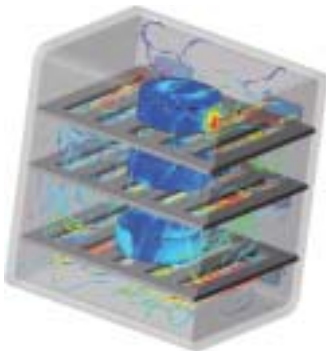
- COSMOSFloWorks is fully embedded within the SolidWorks Windows®-native environment
- Automatically detects fluid volume from SolidWorks models and distinguishes between fluid and solid regions. Eliminates the need to create the "fluid volume" as a separate part

Physical modeling

- External and internal flow
- Steady-state and time-dependent fluid flow, heat and mass transfer analysis
- Automatic laminar/turbulent solution with transition
- Incompressible viscous flow
- Compressible viscous flow that includes subsonic, transonic, and supersonic flow regimes
- Non-Newtonian liquids
- Porous media
- Conjugate heat transfer (both conduction and convection)
- Natural and forced convection
- Surface-to-surface radiation
- Wall roughness model

Boundary conditions

- Openings: mass flow, volume flow, velocity, pressure, temperature, and concentration (chemical species)
- Volumetric and surface heat source, heat transfer coefficient, emissivity
- Symmetry boundary condition



Radiative heat transfer helps solve problems like heat radiation inside lamps and air conditioning of rooms with large windows.

- Time and coordinate-dependent boundary conditions, sources, and initial conditions
- External and internal fans with predefined fan curves
- Direction, swirl, or predefined profiles for flow boundary condition
- Zooming technique: transfer results of one analysis as initial and boundary condition for new simulations

Mesh generation

- Automatic mesh generation in fluid and solid regions eliminating the need to manually identify an optimum mesh
- Automatic mesh refinement in small geometric features like narrow channels, thin walls, etc.
- Solution adaptive mesh generation

Results visualization

- Dynamic monitoring of results and goals during analysis
- Direct display of results on the SolidWorks model
- Full support of the flexible model coloring and transparency concept of SolidWorks for perfect result pictures
- Three-dimensional flow trajectories
- Particle tracking model: spherical particles with density and size
- Animation of results
- Plot any solution or derived quantity on SolidWorks planes or surfaces: contours, vectors, isolines
- Plot flexible colored iso-surfaces of any solution or derived quantity
- Plot any solution or derived quantity along a curve defined by SolidWorks sketch
- Support of local coordinate systems for results
- Probe tool to query results at any location in the model
- Output of solution, derived and integrated quantities to Microsoft Excel
- Automatic design reports in Microsoft Word format

Bundles

COSMOSFloWorks Standard

- Compressible/incompressible flow
- External/internal flow
- Steady-state and transient flows
- Conjugate heat transfer
- Comprehensive database with predefined fluids and fan curves

COSMOSFloWorks PE

- COSMOSFloWorks Standard
- Mesh based visualization and output
- Semiautomatic mesh and solver setting controls
- Surface-to-surface radiation
- Non-Newtonian liquids
- Zooming technique. Transfer results of one analysis as initial and boundary condition for new simulations

COSMOSWorks™ Professional with Flow Standard

- COSMOSWorks Professional
 - Linear static, stress and displacement
 - Frequency and buckling
 - Thermal
 - Assemblies with gap/contact
- COSMOSFloWorks Standard

System requirements

- Pentium® - or AMD Athlon™-class processor
- Microsoft Windows XP, Windows 2000, Windows NT®, Windows Me, or Windows 98
- 256 MB RAM or greater
- 200 MB disk space or greater
- CD-ROM drive
- Pointing device
- OpenGL hardware graphic support is recommended but not required

COSMOS™

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