



Published on *CD-adapco* (<http://www.cd-adapco.com>)

[Home](#) > CD-adapco Adds Realism to Simulation in STAR-CCM+ v9.02

---

## CD-adapco Adds Realism to Simulation in STAR-CCM+ v9.02



### CD-adapco Adds Realism to Simulation in STAR-CCM+ v9.02

*STAR-CCM+ v9.02 to be revealed at the STAR Global Conference 2014 in Vienna, March 17-19.*

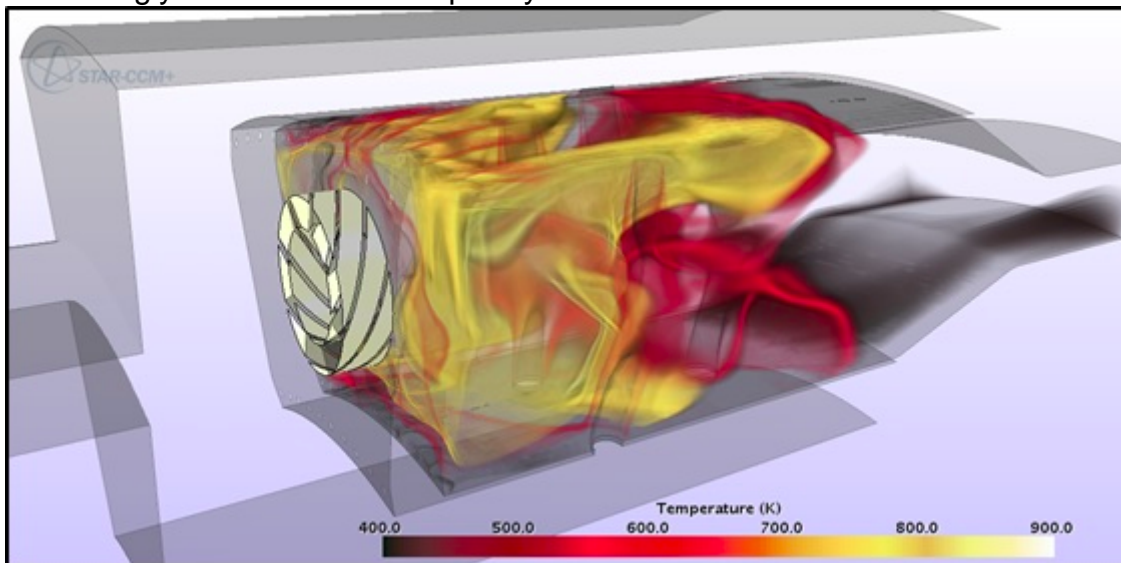
New York and London. February 26, 2014

CD-adapco, the largest privately held CFD focused provider of Computer Aided Engineering software, today announced the release of STAR-CCM+® v9.02, the latest major release of its flagship simulation tool. The company focused on increasing users productivity and simulation turnaround time, as well as a range of new application areas while making simulation more realistic for customers.

“Since engineering simulation is a results-based discipline, in STAR-CCM+ v9.02 we enhanced our workflow capabilities and the speed and scalability of our solvers. This leads to greater throughput and ensures the product development process is fed with a constant and accurate stream of simulation data,” said Senior VP of Product Management, Jean-Claude Ercolanelli. “All aspects of our v9 release cycle will stay focused on adding realism to the simulations, and driving optimal results for customers in a shortened amount of time.”

### More Realism

Computational Fluid Dynamics simulations involve the calculation of scalar quantities such as pressure, temperature, species concentration, turbulence intensity etc. In order to visualize these quantities CFD engineers have traditionally had to use "surfaces," either the domain boundaries, artificial sections through the model or iso-surfaces. This process becomes increasingly difficult as the complexity of models increases.



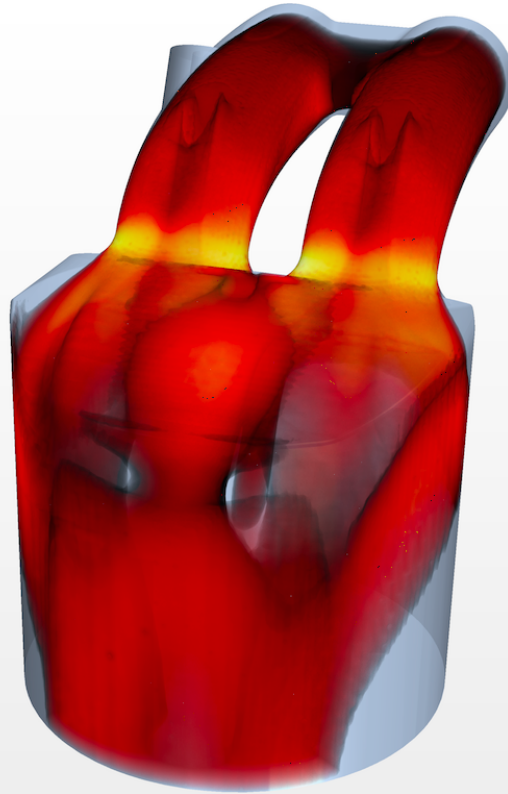
To address this, STAR-CCM+ v9.02 includes a new volume rendering capability that allows engineers to "see inside" a flow-field for the first time. In the volume render illustration of the Combustion Chamber (above), we can not only see the fine structures associated with temperature variations, but we also have an idea of where temperature gradients are high or low. Higher scalar gradients are more opaque whereas lower ones are more transparent. If we compare the volume rendered illustration to a series of iso-surfaces, the utility of this new visualization method immediately becomes clear.

[Read more...](#) [1]

## Increased Throughput

One of the greatest challenges of engineering analysis is being able to understand how changes in geometry and flow features might influence your product's performance. For a long time, the only way to appreciate the sensitivity of engineering objectives to changes in input was to run multiple analyses and to manually dig through the results.

The introduction of the adjoint solver in STAR-CCM+ v8.04, however, changed that allowing for direct access to sensitivity information from a single simulation! In STAR-CCM+, v9.02, we have a number of new features to broaden the applicability and improve the ease-of-use of the adjoint solver. Chief among these developments is the new tumble and swirl cost function implemented based on our industrial users' feedback. This cost function, targeted at the IC engine community, allows for sensitivities to be presented with respect to a key metric used in steady-state port flow analyses. In such studies, improving the tumble and swirl characteristics of the port is critical.

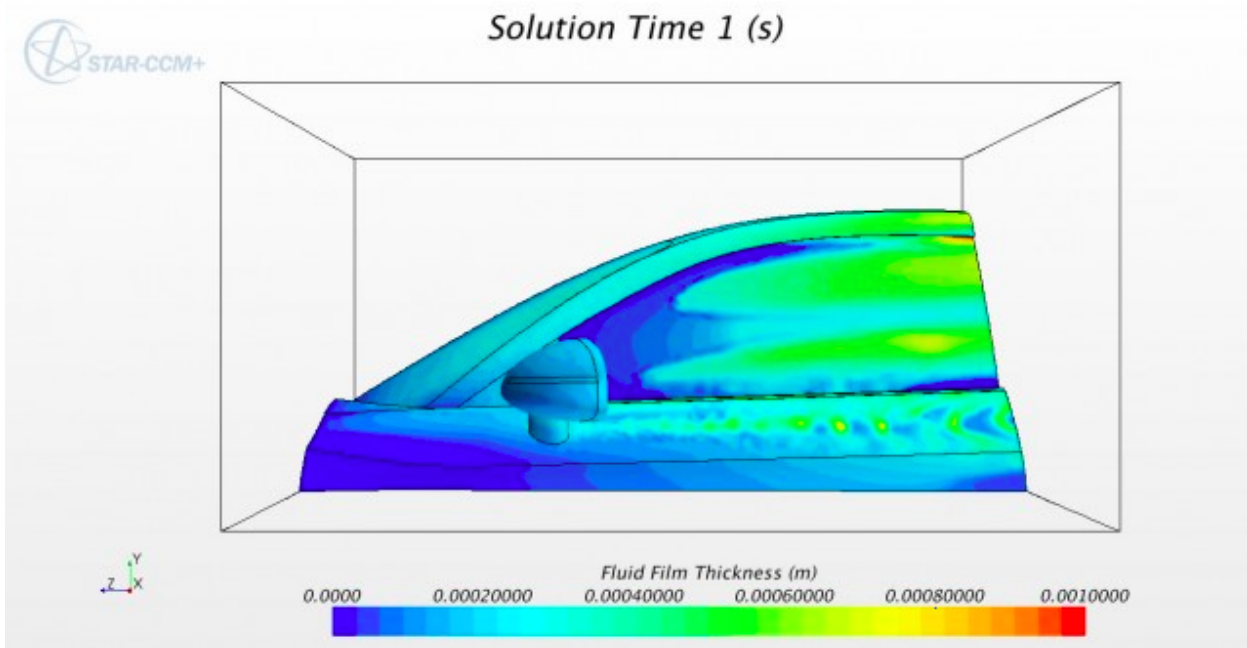


To improve ease-of-use, the adjoint cost functions have been migrated to STAR-CCM+'s standard reporting capability. This allows you to understand whether the cost functions you are interested in are returning sensible values before you run the adjoint solver itself.

[Read more...](#) [2]

### **Improved Accuracy**

Until recently, simulating multiphase problems such as aircraft icing, vehicle soiling and water management has presented a significant computational challenge, due to the need to model the tiny particles of water as huge numbers of discrete Lagrangian droplets. The injection of such a large number of droplets, which are typically tens of microns in diameter, made such simulations computationally expensive, and impingement could be irregular unless a very large number of droplets were injected.



Released in STAR-CCM+ v9.02, the new Dispersed Multiphase model is a lightweight, computationally efficient, Eulerian model which treats the impinging water droplets as a continuous background phase superimposed on the single phase primary flow. This results in simulations that are much less computationally expensive than the Lagrangian equivalent, without the need for the full physics capability of Eulerian Multiphase (EMP). This approach guarantees a smooth and repeatable impingement pattern on the car, aircraft or other geometry being modeled, so that high quality results can be achieved at the first attempt.

[Read more...](#)<sup>[3]</sup>

## About CD-adapco

CD-adapco (<http://www.cd-adapco.com> <sup>[4]</sup>) is the world's largest privately held CFD focused CAE provider. Our core products are the technology-leading simulation packages, STAR-CCM+ and STAR-CD. The scope of our activities, however, extends well beyond CFD software development to encompass a wide range of CAE engineering services in fluid dynamics, heat transfer and structural engineering. Our ongoing mission is to "inspire innovation and reduce costs through the application of engineering simulation software and services."

A privately owned company, CD-adapco has maintained 17% organic year-on-year growth over the last 5 years. CD-adapco employs 800 talented individuals, working at 30 different offices across the globe.

## Press Contact

Lauren Gautier, CD-adapco  
[lauren.gautier@cd-adapco.com](mailto:lauren.gautier@cd-adapco.com) <sup>[5]</sup>  
 +1 248-277-4600

## Products:

[STAR-CCM+®](#) <sup>[6]</sup>  
[Latest Release](#) <sup>[7]</sup>  
[Adjoint Flow Solver](#) <sup>[8]</sup>

Application Specific Tools [9]  
Performance and usability [10]

CD-adapco is the world's largest independent CFD focused provider of engineering simulation software, support and services. We have over 30 years of experience in delivering industrial strength engineering simulation.

---

**Source URL:** <http://www.cd-adapco.com/pr/cd-adapco-adds-realism-simulation-star-ccm-v902>

**Links:**

- [1] <http://www.cd-adapco.com/blog/matthew-godo/star-ccm-v902-preview-volume-rendering>
- [2] <http://www.cd-adapco.com/blog/joel-davison/star-ccm-v902-adjoint-tumble-and-swirl>
- [3] <http://www.cd-adapco.com/blog/david-mann/star-ccm-v902-sneak-peek-dispersed-multiphase>
- [4] <http://www.cd-adapco.com>
- [5] <mailto:lauren.gautier@cd-adapco.com>
- [6] <http://www.cd-adapco.com/products/star-ccm%C2%AE>
- [7] <http://www.cd-adapco.com/products/latest-release>
- [8] <http://www.cd-adapco.com/products/star-ccm%C2%AE/adjoint-flow-solver>
- [9] <http://www.cd-adapco.com/products/star-ccm%C2%AE/application-specific-tools>
- [10] <http://www.cd-adapco.com/products/star-ccm%C2%AE/performance-and-usability>